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G.U.L.F.

Gulf United for Lasting Fisheries

G.U.L.F. Sustainability Benchmarking Report based on A Checklist for Fisheries Resource Management Issues Seen From The Perspective of the FAO Code of Conduct for Responsible Fisheries ("Caddy Checklist", FAO Circular 917, 1996)

As applied to the Texas shrimp fishery

brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*)
pink shrimp (*Farfantepenaeus duorarum*)

Audubon Nature Institute

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The Caddy Checklist (John Caddy, FAO 1996), an operationalized version of the Food and Agriculture Organization's (FAO) Code of Conduct for Responsible Fisheries (CCRF), was used to benchmark the Texas shrimp fishery, drawing information from the public documents, Texas Parks and Wildlife Department (TPWD) and NOAA Fisheries data and reports, and interviews with TPWD staff and Texas shrimp industry members, against the clauses of the Checklist. This Sustainability Benchmarking Report was authored by Audubon Nature Institute, and prepared by Laura Picariello, Research Manager of Gulf United for Lasting Fisheries program, under the GSMFC Oil Disaster Recovery Program, Grant Award No. NA10NMF4770481.

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Key Terms and Acronyms

BMP- Best Management Practices
BPL- beam plankton nets
BRP- Biological Reference Point
CCRF- Code of Conduct for Responsible Fisheries
CEA- Cooperative Enforcement Agreement
CONAPESCA- Mexico's National Commission of Aquaculture and Fishing
COOL- Country of Origin Labeling
CWCS- Comprehensive Wildlife Conservation Strategy
CZMA- Coastal Zone Management Act
CZMP- Coastal Zone Management Program
DOC- Department of Commerce
DOI- Department of Interior
EEZ- Exclusive Economic Zone
EIS- Environmental Impact Statement
EPA- Environmental Protection Agency
FAO- Food & Agriculture Organization of the United Nations
FMP- fishery management plan
GCRL- Gulf Coast Research Lab
GDAR- Gulf Data, Assessment and Review
GMFMC- Gulf of Mexico Fishery Management Council
GOM- Gulf of Mexico
GoMI- Gulf of Mexico Initiative
GSMFC- Gulf States Marine Fisheries Commission
GSS- Gulf Shrimp System
HACCP- Hazard Analysis and Critical Control Points
IJF- Interjurisdictional Fisheries Program
JEA- Joint Enforcement Agreement
LDWF- Louisiana Department of Wildlife & Fisheries
LEC- Law Enforcement Committee
Fisheries, and Parks
MSA- Magnuson-Stevens Fishery Conservation and Management Act
MSY-maximum sustainable yield
NMFS- National Marine Fisheries Service
NEP- National Estuary Program
NERR- National Estuarine Research Reserve
NGO- non-governmental organization
NIFA- National Institute of Food and Agriculture
NOAA- National Oceanic and Atmospheric Administration
NPS- National Park Service
NRCS- Natural Resources Conservation Service
NRDA- Natural Resource Damage Assessment
NWRS- National Wildlife Refuge System
ODRP- Oil Disaster Recovery Program
PA- Precautionary Approach
RESTORE- Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act
SAGARPA- Mexican Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
SEAMAP- Southeast Area Monitoring and Assessment Program
SEDAR- Southeast Data, Assessment and Review
SEFSC- Southeast Fisheries Science Center
SGCN- species of greatest conservation need
SPS- Agreement of Sanitary and Phytosanitary Measures
SWG- State Wildlife Grant
TBT- Technical Barriers to Trade
TED- terrapin excluder device
TIP- Trip Interview Program
TPWC-Texas Parks and Wildlife Commission
TPWD- Texas Parks and Wildlife Department
USACE- U.S. Army Corps of Engineers
USDA- U.S. Department of Agriculture
USFDA- U.S. Food and Drug Administration
USFWS- U.S. Fish and Wildlife Service
USCG- Unites States Coast Guard
VMS- vessel monitoring system
WMA- Wildlife Management Area
WRD- Water Resources Division
WTO- World Trade Organization

Executive Summary

The initial assessment for this project was conducted under the Gulf States Marine Fisheries Commission (GSMFC) Oil Disaster Recovery Program (ODRP), Grant Award No. NA10NMF4770481, at the request of GSMFC to create Marine Advancement Plans (MAPs) based on assessments of U.S. fisheries in the Gulf of Mexico against internationally recognized standards of sustainability. Comprehensive information on the fishery was gathered through interviews with management and industry representatives, public documents, and research publications, and compared to the United Nations Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries (CCRF). The CCRF is the foundational document for the FAO Ecolabelling Guidelines, as well as many sustainability certification standards currently used in the marketplace. "A checklist for fisheries resource management issues seen from the perspective of the FAO Code of Conduct for Responsible Fisheries", known as the "Caddy Checklist", was chosen based on its functionality as an operationalized version of the CCRF. The Caddy Checklist focuses on the sustainability of management measures by addressing five key areas of the fishery: fisheries management, fishing operations, integration of fisheries into coastal area management, post-harvest practices and trade, and fisheries research. By taking clauses of the CCRF and transforming statements into questions, it is possible to measure the robustness of fishery management and sustainability.

The scope of the Texas Shrimp MAP includes the shrimp fishery management and fishing operations in Texas state waters and federal U.S. Exclusive Economic Zone (EEZ) waters in the Gulf of Mexico for the primary shrimp species, brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus Setiferus*), taken for human consumption. The primary gear type is otter trawl. The Texas shrimp fishery is part of the larger Gulf of Mexico Shrimp Fishery including Texas, Louisiana, Alabama and Florida. The fishery is managed by the Gulf of Mexico Fishery Management Council and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) in federal waters, with each state retaining management authority in state waters.

Of the 174 questions in the SBR used to benchmark the fishery, the Texas shrimp fishery received the following rankings, indicating high compliance with CCRF principles:

Texas Shrimp Results		
RATING	**description**	**# of questions**
GREEN	full credit	157
AMBER	partial credit	14
RED	no credit	0
N/A	not applicable	3

This report has been audited by Global Trust Certification, LTD (GTC), a third-party certification assessment body. GTC verified that the justifications provided for scoring met the approval of a certifying organization. GTC also provided a set of recommendations to increase the scoring of responses that did not meet a full GREEN rating. Recommendations provide by GTC and industry members provide the basis for a Texas Shrimp MAP Action Plan. Recommendations for the Texas shrimp fishery include increased compliance with Turtle Excluder Device (TED) and Bycatch Reduction Device (BRD) regulations, increased observer coverage levels, documentation of non-fish catches, documentation of crew members and competency training in areas such as TED/BRD maintenance, and updating of the Texas state Shrimp Fishery Management Plan.

Introduction

This project has been conducted under the Gulf States Marine Fisheries Commission (GSMFC) Oil Disaster Recovery Program (ODRP), Grant Award No. NA10NMF4770481 at the request of the commission to assess the sustainability of U.S. state fisheries in the Gulf of Mexico against industry recognized standards of sustainability. The Caddy Checklist was chosen as the basis for the Sustainability Benchmarking Report based on its functionality as an operationalized version of the Code of Conduct of Responsible Fisheries, which is an internationally agreed set of standards developed through the United Nations Food and Agriculture Organization (FAO). The Checklist focuses on the sustainability of management measures; by taking clauses of the Code and transposing statements into questions, it is possible to quantify and score the system used to manage the fishery, to measure the robustness of management and sustainability.

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).

John Caddy, the author of the Checklist (1996), makes a number of pertinent observations for how best to utilize the document, and where its potential strengths and weaknesses lie. His points are salient and should be borne in mind when examining how this document was used to benchmark the Texas shrimp fishery.

When utilizing the checklist, it is important to remember the scope of the document, and its intended purpose as it applies to verifying management practices. *"The [...] document concentrates principally on issues related to fisheries management in the narrower sense of resource management, notably those clauses found in Article 7, Fisheries Management. Selected clauses from other Articles, i.e. Article 8, Fishing Operations, Article 10, Integration of Fisheries into Coastal Area Management, Article 11, Post-Harvest Practices and Trade, and Article 12, Fisheries Research, are also included here, where they seem of particular concern to the question of resource management, sensu strictu, but should also be considered separately where this seems appropriate."*

Rightfully so, the checklist places the greatest burden of proof on government bodies who ultimately own and control the resources in question. *"A further aspect that was inevitably emphasized by the intergovernmental process that gave rise to the Code is the high proportion of clauses that refer to State responsibility."* Therefore, benchmarking a fishery and the responses of state management agencies against the checklist is an appropriate use of this document.

The checklist was designed to take into account all users of the resource, whether high-seas or inshore. However, owing to the level of state responsibility within the shrimp fishery and the manner by which United States fisheries are managed, additional modifications are necessary. Caddy addresses this issue by saying, *"This questionnaire does not attempt to cover the full scope of [the FAO Code], however, and it will be necessary to delete or modify the asterisked clauses for fisheries wholly under national jurisdiction."* In this case, the checklist has been further modified to discount clauses that do not pertain to a U.S. fishery that falls entirely within U.S. jurisdiction. Texas shrimp fishery extends beyond state territorial waters and is part of the larger Gulf of

Mexico shrimp fishery; therefore, both state and federal management are considered within this report. This checklist will address regional collaboration between state and federal agencies. In other cases, questions with only a 'yes' or 'no' option have been modified to include 'some' in order to better quantify the efforts of the management agencies.

As an outside and neutral body, Audubon Nature Institute's G.U.L.F. program is capable of maintaining an unbiased view when evaluating Gulf of Mexico state and federal management systems. Additionally, G.U.L.F. has contracted a third party assessment group, Global Trust Certification, Ltd (GTC), to audit this benchmarking report for verification that the scoring and evidence provided meets the approval of an accredited certification body (verification report issued by GTC can be provided upon request.) According to Caddy, this is appropriate given the way in which the checklist was constructed: *"In formulating the individual clauses of the Code as questions, [...] the questions are addressed to a more general audience, when this seemed appropriate, rather than to the "State", so that they can be hopefully answered by different levels of representation of those involved in the fisheries world."* Despite its neutral stance, G.U.L.F.'s answers to the questions found in the checklist will necessarily be subject to the interpretation of the authors, something Caddy himself realized as a reality when using his document. *"There are many pitfalls in attempting to interpret the 'correct' response to, and appropriate overall weighting for, a given question, depending on the definitions followed as well as the point of view. Some simple examples of the problem of definitions are, for example, the common phrases "conservation and management measure", "confidentiality requirements", "complete and reliable statistics", etc."* G.U.L.F. welcomes feedback from TPWD or other agencies that choose to question the interpretations and answers found in this document, and recognizes that this checklist is a living assessment. *"Commonly used meanings of the terms used are implied, but clearly different definitions of a given term exist and will influence how a particular question is answered."* We expect that as technologies and regulations change and improve, so, too, will the answers found in this document.

Sound science requires questioning of information and answers, which is acknowledged by Caddy. *"The particular approach taken to translating the answers to such questions into quantitative terms is certainly debatable, and other weightings for the scores are certainly possible. It is justifiable[...] if only because a scoring of the questionnaire by those involved or interested in the fisheries conservation and management process should lead to a clarification of the current situation of a given fishery. It would be particularly useful if it led to a short commentary by the respondent after each question, reflecting a general consensus on the answer to be provided and discussing its applicability in the particular circumstance of the fishery in question."* Again, Audubon Nature Institute's G.U.L.F. program welcomes the feedback of TPWD managers and scientists, or other interested stakeholders.

Finally, it is beneficial for the reader to bear in mind that these clauses are not weighted, but instead each is given the same value regardless of its importance (which is also subjective). *"The questionnaire begins with Article 7, Fisheries Management, and the assumption that a particular fishery resource, with geographical boundaries, is to be managed, and it attempts to establish whether or not issues raised in the Code of Conduct have been dealt with, totally or in part. A possible scoring for the questions is proposed which can be summed separately for each major Article. These scorings should be interpreted with caution, however, not only because of the subjective nature of the responses but also because no attempt is made to ensure that the scores reflect the relative importance of the questions or of the clauses of the Code that refer to it, nor is*

it inevitably the case, given the multiplicity of management systems in operation and the differing importance of the individual questions, that a lower score automatically means that one fishery is "less responsible" than another. The scoring may, however, have some value as an incentive for action and can serve as a way of comparing the performance of a given fishery management system for two or more fisheries." Part of the value of the checklist is that it allows a reviewer to both consider the peculiarities of a given fishery or management plan while still allowing for some standardization of scoring and therefore an additional objective eye on the processes occurring.

The Texas shrimp fishery has been benchmarked here against the Caddy Checklist to compare the management system of the resource against the criteria of international best practices, as applicable to an inshore fishery. The Caddy Checklist consists of a total of 193 questions that encompass five pertinent areas of the Code. As regards the Texas shrimp fishery, some questions referring to international requirements and fisheries based in developing countries are not applicable. 174 questions were identified, which focus on management, objectives, scientific practices, integration into coastal area management, and policy measures, which are directly applicable to state managed fisheries in the Gulf of Mexico. Two questions within these 174 have been determined as N/A for the Texas blue crab fishery; therefore the final scoring is out of 172. What follows is an assessment of the fishery as it currently stands on the date submitted.

The score of "yes"= 1 GREEN, "no" = 0 RED, or "Some"= 1/2 AMBER is given for each question in the Sustainability Benchmarking Report and is followed by a written response that justifies the rating, provides an explanation or current evidence to support the score, and identifies possible gaps to the particular Code provision under consideration. Each written justification is referenced to sources with websites and other electronic links, when possible, directly below each response to provide further detail for information. Scoring is presented in two separate formats, first, as a "stoplight" system of Red, Amber, Green indicating level of compliance, and secondly, in Appendix A, as a numerical scoring of 1, 1/2, or 0 for each response. As noted above, Caddy recommends caution in utilizing the numerical scores, as questions are not weighted.

The following page provides a chart of ranking for each Sustainability Benchmarking Report question, rated as follows:

GREEN=1 (full credit) **AMBER**=.5 (partial credit) **RED**= 0 (no credit)

N/A= questions that have been excluded from scoring as not relevant at this time

The Texas shrimp fishery received the following rankings:

GREEN – 157 **AMBER – 14** **RED – 0** **N/A – 3**

Rankings of AMBER and RED are considered gaps in current practices and G.U.L.F. will utilize these responses in creating a subsequent MAP report containing a series of recommendations for advancement of the fishery towards greater sustainability.

7 – Fisheries Management	Rating
7.1.1 (a)	
7.1.1. (b)	
7.1.1. (c)	
7.1.2 (a)	
7.1.2 (b)	
7.1.3 (a)	
7.1.3 (b)	
7.1.4	
7.1.4 (a)	
7.1.4 (b)	
7.1.4 (d)	
7.1.4 (e)	
7.1.6 (a)	
7.1.6 (b)	
7.1.7 (a)	
7.1.7 (b)	
7.1.8 (a)	
7.1.8 (b)	
7.1.9(i) – Assessment	
7.1.9(ii) – Management	
7.1.9(iii) – Decision making	
7.1.10	
7.2.1 (a)	
7.2.1 (b)	
7.2.1 (c)	
7.2.2 (a)(i) – Defined	
7.2.2 (a)(ii) – Avoided	
7.2.2 (b) – Economic conditions	**N/A**
7.2.2 (c)– Small-scale interests	
7.2.2 (d) – Biodiversity	
7.2.2 (e) – Depleted stocks	
7.2.2 (f) – Environmental impacts	
7.2.2 (g)(i) – Pollution	
7.2.2 (g)(ii) – Ghost fishing	
7.2.2 (g)(iii) – Fishing methods	
7.2.3	
7.3.1 (a)	
7.3.1 (b)	
7.3.1 (c)	
7.3.1 (d)	
7.3.1 (f)	
7.3.2	
7.3.3 (i) – Plan exists	
7.3.3 (ii) – Plan subscribed to	
7.3.4 (i) – Information gathering	
7.3.4 (ii) – Research	
7.3.4 (iii)– Management	
7.3.4 (iv)– Development	
7.4.2 (i) – Resource	
7.4.2 (ii) – Climate & environment	
7.4.2 (iii) – Socio-economics	
7.4.3 (i) – Cost-benefit	**N/A**
7.4.3 (ii) – Alt. management	
7.4.4	
7.4.5	
7.4.6 (i) – Agreed format	
7.4.6 (ii) – Timely manner	
7.4.7	
7.5.1 (a)	
7.5.1 (b)	
7.5.2/7.5.3 (i) – Target ref. points	
7.5.2/7.5.3 (ii) – Limit ref. points	
7.5.2/7.5.3 (iii) – Research proc.	
7.5.2/7.5.3 (iv) – Mgmt. actions	
7.5.5 (a)	
7.5.5 (b)(i) – Natural phenomena	
7.5.5 (b)(ii) – Fishing impact	
7.6.1	
7.6.2	
7.6.3 (a)	
7.6.3 (b)	
7.6.5	
7.6.6	
7.6.7	
7.6.8 (i) – Review procedures	
7.6.8 (ii) – Flexible mechanism	
7.6.9 (a)(i) – Waste and discards	
7.6.9 (a)(ii) – Non-target catch	
7.6.9 (a)(iii) – ETP species	
7.6.9 (b)(i) – Fish size	
7.6.9 (b)(ii) – Gear	
7.6.9 (b)(iii) – Discards	
7.6.9 (b)(iv) – Seasons	
7.6.9 (b)(v) – Closed areas	
7.6.9 (b)(vi) – Artisanal areas	
7.6.9 (b)(vii) – Juveniles	
7.6.9 (c)	
7.6.10	
7.7.1	
7.7.2 (a)	
7.7.2 (b)	
7.7.2 (c)	
7.7.3 (i) – MCS	

7.7.3 (ii) – Observers	
7.7.3 (iii) – Inspection	
7.7.3 (iv) – VMS	
7.7.5 (a)	
7.7.5 (b)	

8 – Fishing Operations	**Rating**
8.1.1	
8.1.2	
8.1.3	
8.1.4	
8.1.7	
8.1.8	
8.1.9	
8.1.10	
8.2.1 (a)	
8.2.1 (b)	
8.2.4	
8.2.7 (a)	
8.2.7 (b)	
8.4.2	
8.4.3 (a)(i) – Fishing operations	
8.4.3 (a)(ii) – Non-fish catches	
8.4.3 (a)(iii) – Fish catches	
8.4.3 (b)	
8.4.4	
8.4.5	
8.4.6	
8.4.7	
8.4.8 (i) – Environmental impacts	
8.4.8 (ii) – Social impacts	
8.4.8 (iii) – Biodiversity impacts	
8.4.8 (iv) – Coastal fisheries	
8.5.1 (a)	
8.5.1 (a) Supplemental	
8.5.1 (b)	
8.5.2	
8.5.3	
8.5.4	

10 – Institutional Framework	**Rating**
10.1.1	
10.1.2	
10.1.3	
10.1.4 (a)(i)	
10.1.4 (a)(ii)	
10.1.4 (b)	
10.2.1	
10.2.2 (i) – Economic	
10.2.2 (ii) – Social & cultural	
10.2.3	
10.2.4	
10.2.5 (i) – Environment & biology	
10.2.5 (ii) – Economy & social	
10.2.5 (iii) – Legal & institutional	
10.3.1 (i) – Use of resources	
10.3.1 (ii) – Conservation of environment	

11 – Post-harvest Practices & Trade	**Rating**
11.1.11	
11.2.3	

12 – Fisheries Research	**Rating**
12.1 (a)	
12.1 (b)	
12.1 (c)	
12.2	
12.3 (a)	
12.3 (b)	
12.3 (c)	
12.4 (a)	
12.4 (b)	
12.5 (a)	
12.5 (b)	
12.6	
12.7 (a)	
12.7 (b)	
12.8 (a)	
12.8 (b)	
12.10 (a)	
12.10 (b)	
12.10 (c)	
12.11 (a)	
12.11 (b)	
12.12	
12.13 (a)	
12.13 (b)	
12.14	**N/A**
12.17	

Article 7 – Fisheries Management

7.1.1 (a) Are conservation and management measures based on the best scientific evidence available? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Texas shrimp fishery is part of a larger Gulf of Mexico shrimp fishery, based on stock determinations, and is managed regionally. Management of the Gulf of Mexico shrimp fishery is the responsibility of the Gulf of Mexico Fishery Management Council (GMFMC) and NOAA fisheries in waters from nine nautical miles (nm) out to 200 nm. Individual states maintain responsibility for management within state waters; therefore, Texas Parks and Wildlife Department (TPWD) is responsible for management of shrimp in Texas state waters out to three nautical miles. Texas participates in the GMFMC and manages the shrimp fishery in state waters consistent with federal regulations. **<u>Federal</u>:** 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.[1] The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management. National Standard 2 (NS2) requires that "*Conservation and management measures shall be based upon the best scientific information available."* [2] The MSA, section 302(g)(1)(A) requires each regional management council to form a Scientific and Statistical Committee (SSC) to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[3] The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf States. NOAA Fisheries Southeast Fisheries Science Center (SEFSC), based in Miami, Florida, is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[4] SEFSC maintains labs in Galveston, TX, Lafayette, LA, Panama City, FL, Pascagoula, MS and Stennis, MS. The SEFSC Research and Data programs are responsible for biological, economic and socio-cultural research and data collection for commercial and recreational fisheries, economics and fisheries-independent data. SEFSC		

conducts stock assessments for all species managed by GMFMC; stock assessments for shrimp are conducted through the Galveston Lab Shrimp Fishery Research Program.[5] The SEFCS collects fishery-dependent data for the shrimp fishery through the Gulf Shrimp System (GSS). The GSS utilizes port agents throughout the Gulf of Mexico to collect landings data (amount and value) from seafood dealers, and interview data (fishing effort and location) from fishermen.[6] Additionally, all federal Gulf shrimp permit holders are required to report annual landings each year through the Annual Landings Form (ALF) as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data.[7] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program. The Galveston Lab focuses research efforts on Fishery Management, Fishery Ecology and Protected Species with strong emphasis on the shrimp fishery.[8] The ELB program began in 2007 and between 2007 and 2013, NOAA Fisheries funded and collected data on approximated 500 shrimp vessels through the program.[9] In 2014, the program changed format to a cellular ELB (cELB) program and continues to use a stratified random sampling method to select participants each year. If selected, Gulf shrimp permit holders are required to participate in the program and permit renewal is contingent upon participation. The ELB program collects data on amount and location of shrimp landings. Gulf shrimp permit holders are also required to carry an observer if selected for the Galveston Laboratory Observer Program. Similar to the ELB program, permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The focus of data collection for the observer program for the shrimp fishery is bycatch and bycatch reduction device evaluation.[10]

For the shrimp fishery, there is a heavy focus on research regarding bycatch of the fishery.[11] The Pascagoula Lab in MS 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 bycatch reduction devices 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 bycatch reduction devices (BRDs).[12]

GMFMC implemented the Shrimp Fishery Management Plan (FMP) in 1981, which included brown shrimp, white shrimp, pink shrimp (*Penaeus duorarum*), royal red shrimp (*Pleoticus robustus*), seabobs (*Xiphopeneus kroyeri*) and rock shrimp (*Sicyonia brevirostris*) in the Gulf of Mexico. Seabobs and Rock shrimp have since been removed from the plan, and the current shrimp FMP covers management of white, brown, pink and royal red shrimp. The Shrimp FMP is under constant revision based on ongoing research and best available science and the FMP has been amended 16 times since implementation.[13]
The goals/objectives of Shrimp FMP are:[14]

- Optimize the yield from shrimp recruited to the fishery
- Encourage habitat protection measures to prevent undue loss of shrimp habitat

- Coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible.
- Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act
- Minimize the incidental capture of finfish by shrimpers, when appropriate
- Minimize adverse effects of underwater obstructions to shrimp trawling
- Provide for statistical reporting system

Texas:

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.

In 2005, TPWD requested and received an independent peer-review of the TPWD fisheries science programs by the American Fisheries Society (AFS), which is the principal professional organization of fisheries scientists in the United States.[15] This review was conducted for the purpose of "determining whether TPWD is using the best, most efficient techniques for monitoring, managing, and protecting its aquatic natural resources." The review found that the CFD had developed comprehensive protocols for obtaining scientifically sound data on fish populations, habitats, and participants of the fisheries. AFS determined that assessments made under these protocols were effective for science-based management of both recreational and commercial fisheries. AFS also determined that procedures for internal evaluation and updates of assessment protocols are in place. The AFS review produced 13 recommendations for CFD and four recommendations regarding data collection on Human Dimensions (HD). TPWD has implemented all of the recommendations made by the AFS review panel and continues to maintain and review the scientific protocols in place to ensure that the best scientific advice is available to management.[2]

Prior to 2007, TPWD collected fishery-dependent data through the Monthly Aquatic Products Report (MAPR) system, which was a monthly self-reporting system for seafood dealers.[17] TPWD instituted a Trip Ticket Program in 2006, requiring all dealers of aquatic products to report statistical harvest data on a trip basis.[18,19] This system is equivalent to the reporting systems used nationally for collection of commercial landings data and requires the following standard information: trip date, trip number, vessel ID number, participant ID number, species, quantity landed, landing condition, market size range, ex-vessel value,

location landed, dealer ID, transaction date, gear used, and area fished.[20] TPWD also coordinates with and participates in research conducted by the Gulf States Marine Fisheries Commission (GSMFC) and the GMFMC scientific monitoring and review processes, and incorporates recommendations by these regional bodies into management decisions. Chapter 77 of TPW Code, in 1985, directed TPWD to conduct continuous research and study of:[21] - The supply, economic value, environment, and reproductive characteristics of the various economically important species of shrimp - Factors affecting the increase/decrease in shrimp stocks in both annual and long-term cycles - The use and effectiveness of trawls, nets, and other devices for the taking of shrimp - Industrial and other pollution of the water naturally frequented by shrimp - Statistical information on marketing, harvesting, processing, and catching of shrimp landed at points in the state - Environmental parameters in the bay and estuary areas that may serve as limiting factors of shrimp population abundance - Other factors, based on best available scientific information, that may affect the health of economically important shrimp species - Alternative management measures for shrimp The Texas Shrimp FMP was implemented by TPWD in 1989 and requires the Commission to consider the best available scientific information in determining management actions.[22]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] 50 CFR §600.133 (Scientific and Statistical Committee) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[4] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[7] NOAA Fisheries. "2010 Analysis of Gulf Shrimp Moratorium Permits."

[8] "Research" Sou*theast Fisheries Science Center, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/research_home/index.html

[9] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[10] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[11] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[12] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[13] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[14] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[15] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[16] TPWD. Response to "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department" AFS, 2005. Unpublished Report.

[17] Jan Culbertson, Lance Robinson, Page Campbell, and Linda Butler, *Trends in Texas Commercial Fishery Landings, 1981-2001*. (TPWD MDS No. 224, 2004) https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS224.pdf

[18] 5 Tex. Admin. Code § 66.019 http://codes.lp.findlaw.com/txstatutes/PW/5/B/66/A/66.019

[19] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[20] David Donaldson, *Overview of State Trip Ticket Programs in Gulf of Mexico* (SEDAR7-DW-20, 2004) http://sedarweb.org/docs/wpapers/SEDAR7_DW20.pdf

[21] Tex. Parks and Wild. Code § 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

[22] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

7.1.1 (b) Are conservation and management measures designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization and maintain their availability for present and future generations? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Conservation and management measures at both the state and federal level are designed to ensure long-term sustainability and promote optimum utilization.		

Federal:

The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the U.S.[1] National Standard 1 (NS1) requires "*Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."*[2] Current guidelines for NS1 require specification of maximum sustainable yield (MSY) and Optimum Yield (OY), based on the best scientific evidence available, for each fishery managed by the Councils. Additionally, NS1 requires specification of status determination criteria (SDC) so that overfishing and overfished determinations can be made for stocks in the fishery. The NS1 guidelines are designed to prevent overfishing and ensure that the fishery achieve OY and require corrective actions to be taken to rebuild stocks if overfishing or overfished conditions occur.

The GMFMC implemented the Shrimp FMP in 1981, which currently includes brown shrimp, white shrimp, pink shrimp, and royal red shrimp in the Gulf of Mexico.[3] The goals/objectives of Shrimp FMP include optimizing the yield of shrimp recruited to the fishery and habitat protection measures to prevent undue loss of shrimp habitat: Amendment 5 of the Shrimp FMP defined overfishing and provided measures to restore overfished stocks, should overfishing occur, for brown, pink and royal red shrimp, and Amendment 7 similarly defined overfishing and measures to restore stocks if overfished for white shrimp.[4,5] Amendment 13 further defined reference points for each of the penaeid shrimp species to comply with the requirements of MSA NS1 and includes definitions of Maximum Fishing Mortality Threshold (MFMT) and Minimum Stock Size Threshold (MSST).[6] The GMFMC manages the shrimp fishery in relation to these reference points to ensure optimal yield and long-term availability for future generations. In 2015, Amendment 15 was passed, which redefined the SDC for the shrimp fishery based on recent updates to the stock assessment model.[7] Additionally, Amendment 13 implemented a 10-year moratorium on new permits for the federal shrimp fishery, capping the number of licenses in the fishery. In December 2015, GMFMC adopted Amendment 17A, which extends the permit moratorium for an additional 10 years. GMFMC is currently developing two additional amendments to the shrimp FMP.[8]

The MSA section 306 pertaining to state jurisdictions does provide authority of the U.S. Secretary of Commerce, in the event that the state takes any action, or omits to take action, which would substantially and adversely affect the carrying out of a federal FMP, the ability to regulate the fishery within state boundaries pursuant to the FMP and regulations promulgated to implement that FMP.[9]

Texas:

The primary goal of the 1989 Texas Shrimp FMP is "to provide a management strategy for the shrimp fishery in Texas" and requires the TPW Commission to consider the following:[10]

- Measures to prevent overfishing while achieving, on a continuing basis, the optimum yield for the fishery
- Measures based on the best scientific information available

- Measures to manage shrimp throughout their range
- Measures, where practicable, that will promote efficiency in utilizing shrimp resources, except that economic allocation may not be the sole purpose of the measures
- Measure, where practicable, that will minimize cost and avoid unnecessary duplication in their administration
- Measures which will enhance enforcement

This FMP defines optimum yield as "the amount of shrimp the fishery will produce on a continuing basis to achieve the maximum economic benefit to the shrimping industry and the State, as modified by any relevant social or ecological factors".

The recommendations in the FMP served as the basis for regulations developed in subsequent years to ensure the sustainability of the shrimp fishery.
Current shrimp regulations include:[11]

- Limited entry license systems for both inshore shrimping (bay and bait licenses) and offshore shrimping (Gulf license)
- Designated nursery areas including tributary bays, bayous, inlets, lakes and rivers where all shrimping is prohibited
- Specific designated zones for Bay shrimping, Bait shrimping and Gulf shrimping with varying regulations specific to each area to address different user needs, reduce conflict and protect smaller shrimp, which include:
    - Closed seasons
    - trawl number and trawl size regulations
    - bag limits
- Strict gear requirements:
    - Only legal trawls are otter trawl and beam trawl
    - Specific size and mesh requirements for each net type allowed
    - BRDs and TED are required in all trawls (except bait shrimp nets, which are exempt from BRDs, but are required to carry TEDs)

In 1995, the Texas Inshore Bay and Bait Shrimp License Buyback Program was implemented.[12] Due to increased effort in the inshore fisheries (Bay and Bait shrimpers), concern was raised about biological pressure on the stock and loss of larger shrimp to the Gulf and federal offshore fleets and a license limitation and buyback program was implemented with the goal of reducing inshore shrimping effort by 50%. The Shrimp License Management Program established limited-entry requirements for the Bay and Bait shrimp fisheries, established a voluntary buyback system, created definitions of flagrant offenses and license suspension and revocation penalties for violations, and limited vessel upgrade option to prevent increased effort under current licenses available.[13] When the program began, there were over 3200 licenses in the Bay and Bait fisheries; as of 2015, there are now less than 800 licenses, which has exceeded the target reduction goal of the program.[14] In 2005, a limited entry system was also implemented for Texas Gulf shrimp licenses in conjunction with the limited entry system established for federal waters by GMFMC.[15]

TPWD participates in the GMFMC process and complies with the conservation and management measures developed for shrimp by the GMFMC.		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[4] GMFMC. *Amendment 5 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.1991. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-05%20Draft%201991-01.pdf

[5] GMFMC. *Amendment 7 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.1994. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-07%20Final%201994-05.pdf

[6] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[7] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[8] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[9] MSA Section SEC. 306. STATE JURISDICTION http://www.mmc.gov/legislation/pdf/msa306.pdf

[10] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

[11] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[12] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[13] 31 Tex. Admin. Code §58.130 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=130

[14] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

[15] Tex. Parks & Wild. § Code 77.151 http://codes.findlaw.com/tx/parks-and-wildlife-code/parks-wild-sect-77-151.html

7.1.1 (c) Are management measures currently in effect in the fishery designed for the long-term conservation and sustainable use of fishery resources, as opposed to reasons of short-term expediency? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The state and federal management agencies (TPWD, GMFMC, and NOAA Fisheries) work together to ensure that management measures in both jurisdictions are designed for long-term conservation and sustainable use. **<u>Federal</u>:** The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the U.S.[1] National Standard 1 (NS1) requires "*Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."*[2] The current guidelines for NS1 and measures implemented through the GMFMC Shrimp FMP and amendments, as noted above in response to 7.1.1(b), are designed for long-term, sustainable use of the fishery. See previous response for details. **<u>Texas:</u>** As the managing institution for the Texas shrimp fishery, TPWD's mission is "to manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations" and its stated philosophy includes " reliance on the best available science to guide our conservation decisions".[3] In line with this philosophy, all documents governing the shrimp fishery (The Texas Parks and Wildlife Code, and 1989 Texas Shrimp FMP) each clearly state that long-term conservation and sustainable use is the primary focus of management. The Texas Parks and Wildlife Code, Section 61.002 states "The purpose of this chapter is to provide a comprehensive method for the conservation of an ample supply of wildlife resources on a statewide basis to insure reasonable and equitable enjoyment of the privileges of ownership and pursuit of wildlife resources. This chapter provides a flexible law to enable the commission to deal effectively with changing conditions to prevent depletion and waste of wildlife resources" and defines 'depletion' as "the reduction of a species below its immediate recuperative potential by any cause", and 'waste' as "the failure to provide for the regulated harvest of surplus wildlife resources when that harvest would allow, promote, or optimize a healthy and self-sustaining population of a species."[4] TPWD implemented the Texas Shrimp FMP in 1989 to provide a management strategies for the various user needs of the resource.[5] Current shrimp regulations include:[6] - Limited entry license systems for both inshore shrimping (bay and bait licenses) and offshore shrimping (Gulf license)		

- Designated nursery areas including tributary bays, bayous, inlets, lakes and rivers where all shrimping is prohibited - Specific designated zones for Bay shrimping, Bait shrimping and Gulf shrimping with varying regulations specific to each area to address different user needs, reduce conflict and protect smaller shrimp, which include: o Closed seasons o trawl number and trawl size regulations o bag limits - Strict gear requirements: o Only legal trawls are otter trawl and beam trawl o Specific size and mesh requirements for each net type allowed o BRDs and TED are required in all trawls (except bait shrimp nets, which are exempt from BRDs, but are required to carry TEDs) In 1995, the Texas Inshore Bay and Bait Shrimp License Buyback Program was implemented.[7] Due to increased effort in the inshore fisheries (Bay and Bait shrimpers), concern was raised about biological pressure on the stock and loss of larger shrimp to the Gulf and federal offshore fleets and a license limitation and buyback program was implemented with the goal of reducing inshore shrimping effort by 50%. The Shrimp License Management Program established limited-entry requirements for the Bay and Bait shrimp fisheries, established a voluntary buyback system, created definitions of flagrant offenses and license suspension and revocation penalties for violations, and limited vessel upgrade option to prevent increased effort under current licenses available.[8] When the program began, there were over 3200 licenses in the Bay and Bait fisheries; as of 2015, there are now less than 800 licenses, which has exceeded the target reduction goal of the program.[9] In 2005, a limited entry system was also implemented for Texas Gulf shrimp licenses in conjunction with the limited entry system established for federal waters by GMFMC.[10]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] "Mission" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/business/about/mission/

[4] Tex. Parks & Wild. Code §61.002 http://codes.lp.findlaw.com/txstatutes/PW/5/B/61/A/61.002

[5] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

[6] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[7] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[8] 31 Tex. Admin. Code §58.130 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=130

[9] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

[10] Tex. Parks & Wild. § Code 77.151 http://codes.findlaw.com/tx/parks-and-wildlife-code/parks-wild-sect-77-151.html

7.1.2 (a) Have attempts been made to identify domestic parties having a (legitimate) interest in the use and management of fisheries resources? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC is responsible for monitoring and amending FMPs to best use the fishery resource in the Gulf of Mexico.[1] In doing so, they solicit participation from the entire fishing community. Their meetings are open to the public and public participation is actively encouraged. GMFMC uses a public "scoping" period and schedules public hearings to engage stakeholders with the goal of identifying issues, potential impacts, and alternative solutions to fishery management measures. Once a draft plan is prepared, it is presented to the public through hearings/meetings throughout the Gulf Coast for feedback. Comments submitted at these meetings are recorded and displayed on the GMFMC website. GMFMC also accepts comments through comment forms on their website, via email and mail. All comments are reviewed before FMP decisions are finalized. This final action also occurs publically, during GMFMC meetings.[2] GMFMC also communicates publicly via newsletters, social media posts, and cell phone applications, all in an effort to effectively disseminate conservation and management information.[3]Additionally, for every FMP, there is an Advisory Panel (AP) composed of users of the fishery resource. Commercial and recreational fishermen, buyers, sellers, and consumers are all represented. The AP assists in advising GMFMC in the development of FMPs.[4] NOAA Fisheries relies on communication with the public to enhance transparency and increase public confidence in management activities. NOAA Fisheries publishes public comments on their website each month.[5] All reports, including their latest shrimp stock assessments, are always publically accessible via their website.[6] NOAA Fisheries Southeast Regional Office posts updated links to published fishery bulletins seeking public comment on proposed fishery regulation changes. [7,8] Their website also contains a News Room link where the public may access recent media activity.[9] **Texas:** TPWD solicits participation from the entire fishing community and is required by law at both the state and federal level to allow public participation. As a government body, TPWD falls under the Texas Open Meetings Act requiring that all meetings of a government body be open to the public and that the date, time,		

place and agenda of the meeting be publically posted prior to that date.[10] Texas Parks & Wildlife Commission (TPWC) meetings follow this law and information is publically posted via their website.[11] Each year, TPWD publishes the newest regulations in the Texas Parks & Wildlife Outdoor Annual Hunting and Fishing Regulations.[12] TPWD conducts scoping meetings during initial development of new regulations.[13] TPWD also offers other opportunities for public comment throughout the rule-making process including online public comment periods submitted in writing through the website.[14] For example, TPWD held scoping meetings fir shrimp industry stakeholders in December 2014 throughout the coast to discuss potential regulation changes for the fishery. Letters were sent to all current license holders in the shrimp fishery to notify them of the meetings.[15] In April of 2015, TPWD held a meeting for the public to comment on proposed regulation change regarding count/size requirements of commercial shrimping in inside waters, which was a recommendation by industry members during the December 2014 scoping.[16] When significant management changes are proposed for industry, TPWD will develop task forces of industry representatives and stakeholders to assist in the development of these regulations. TPWD maintains a Coastal Resources Advisory Committee (CRAC) composed of public stakeholders to advise the commission on matters that cross fishery and geographic boundaries of coastal Texas.[17]

Texas is also a member of the Gulf States Marine Fisheries Commission (GSMFC). GSMFC is an organization of the five Gulf states that works together to conserve, develop, and fully utilize fishery resources. Each Gulf state is represented equally as GSMFC Commissioners, which set policy, approve budgets, and direct GSMFC activities. GSMFC serves as a discussion center for marine resource issues, allowing stakeholders to voice concerns and opinions regarding fishery resource management. GSMFC meetings are open to the public and allow for public comment periods. Meeting dates, locations and agendas can be found on the GSMFC website.[18]

The industry is engaged in large part via the Texas Shrimp Association (TSA), a non-profit organization that aims to educate stakeholders (consumers, lawmakers, press, environmental groups, and the public) regarding the protection of Texas shrimp as an economically important product, while incorporating a sustainable, environmentally safe shrimp fishery.[19] In the Port Arthur area, an industry led group called the Port Arthur Area Shrimpers Association is also active in helping the shrimp industry by running safety trainings, organizing dockside courtesy inspections for gear checks, and other educational activities.[20]

Additionally, the American Shrimp Processors Association (ASPA) is a separate industry-led organization for the shrimping industry. While based in Mississippi, the membership is open to all Gulf states. ASPA's goal is to represent the interests of domestic shrimp processors and provide a collective voice for the industry. ASPA gathers input from its members, who are stakeholders in the shrimp fishery and works with research and regulatory agencies on important industry issues.[21]

The Southern Shrimp Alliance (SSA) is an industry-led organization composed of shrimp fishermen, processors, and other shrimp industry members from the eight warm water shrimp producing states in the South: Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas. SSA works as an advocate for the domestic shrimping industry, attempting to preserve the fishery by supporting state programs that promote domestic shrimp.[22] Go Texan – Texas Shrimp is a branch of the Texas Department of Agriculture. While largely focusing on consumer marketing, it adds to the industry engagement landscape in the Texas shrimp fishery by organizing industry members and representing their interests.[23]		

[1] "Gulf Council FAQs" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/resources/education_faqs/education_council_faqs.php

[2] "Scoping through Implementation" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/scoping-thru-implementation.php

[3] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[4] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[5] "Enhancing Transparency" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/management/recreational/policy/goal_4.html

[6] "Stock Status Updates" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html

[7] "Fishery Bulletin Archives" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/bulletin_archives/index.html

[8] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[9] *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/index.html

[10] Tex. Gov. Code § 551 http://www.statutes.legis.state.tx.us/SOTWDocs/GV/htm/GV.551.htm

[11] "TPW Commission Meetings" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/meetings/

[12] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[13] Art Morris, June 2014. "Blue Crab Enhancement" PowerPoint presentation. TPWD blue crab industry scoping meetings June 2015.

[14] "Comment on Proposed Regulations and Transactions" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/business/feedback/public_comment/

[15] TPWD Letter to Shrimp License Holders. November 20, 2014.

[16] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

[17] 31 T.A.C. §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

[18] *Gulf States Marine Fisheries Commission. Web*. Accessed September 2015. http://www.gsmfc.org

[19] *Texas Shrimp Association*. Web. Accessed September 2015. http://www.texasshrimpassociation.org/

[20] Port Arthur Area Shrimpers Association. 1500 Jefferson Dr., Port Arthur TX 77642.

[21] *American Shrimp Processors Association*. Web. Accessed September 2015. http://www.americanshrimp.com/association/about/

[22] *Southern Shrimp Alliance*. Web. Accessed September 2015. http://www.shrimpalliance.com/about/

[23] "Texas Shrimp" *Go Texan*. Web. Accessed September 2015. http://www.gotexan.org/ExperienceGOTEXAN/GOTEXANShrimp/ShrimpSuppliers.aspx

7.1.2 (b) Have arrangements been made to consult these parties and gain their collaboration?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: All GMFMC meetings are open to the public.[1] Furthermore, public participation and collaboration is actively encouraged through what GMFMC identifies as a "scoping" period where stakeholders are invited to meet early in the FMP process with the goal of identifying issues, potential impacts, and alternative solutions to fishery management measures. Once a draft plan is prepared, it is presented to the public again through hearings/meetings throughout the Gulf Coast for feedback. Comments submitted at these meetings are recorded and displayed on the GMFMC website. GMFMC also accepts additional comments through comment forms on their website, via email and mail. All comments are reviewed before FMP decisions are finalized. This final action also occurs publically, during GMFMC meetings.[2] Additionally, for every FMP, there is an Advisory Panel (AP) composed of users of the fishery resource. Commercial and recreational fishermen, buyers, sellers, and consumers are all represented. The AP assists in advising GMFMC in the development of FMPs. The Scientific and Statistical Committee (SSC), made up of experts and scientists, also advises GMFMC.[3] NOAA Fisheries relies on communication with the public to enhance transparency and increase public confidence in management activities. NOAA Fisheries publishes public comments on their website each month.[4] All reports, including their latest		

shrimp stock assessments, are always publically accessible via their website.[5] NOAA Fisheries Southeast Regional Office posts updated links to published fishery bulletins seeking public comment on proposed fishery regulation changes. [6,7]

Texas:

TPWD solicits participation from the entire fishing community and is required by law at both the state and federal level to allow public participation. As a government body, TPWD falls under the Texas Open Meetings Act requiring that all meetings of a government body be open to the public and that the date, time, place and agenda of the meeting be publically posted prior to that date.[8] TPWC meetings follow this law and information is publically posted via their website.[9] TPWC also hosts an annual commission meeting each August specifically dedicating time to public comment period, allowing comment on any topic relevant to TPWC authority.[10] TPWD conducts scoping meetings during initial development of new regulations. For example, TPWD held scoping meetings fir shrimp industry stakeholders in December 2014 throughout the coast to discuss potential regulation changes for the fishery. Letters were sent to all current license holders in the shrimp fishery to notify them of the meetings.[11] In April of 2015, TPWD held a meeting for the public to comment on proposed regulation change regarding count/size requirements of commercial shrimping in inside waters, which was a recommendation by industry members during the December 2014 scoping.[12] When organizing scoping meetings for a specific fishery, TPWD sends a letter to all current license holders with information on meeting times, locations and agendas. Several meetings are held across the coast in key areas for the fishery to give stakeholders multiple opportunities to participate and reduce travel time required to attend. TPWD also offers other opportunities for public comment throughout the rule-making process including online public comment periods submitted in writing through the website.[13] When significant management changes are proposed for industry, TPWD will develop task forces of industry representatives and stakeholders to assist in the development of these regulations. TPWD maintains a CRAC composed of public stakeholders to advise the commission on matters that cross fishery and geographic boundaries of coastal Texas.[14]

Texas also gains industry and stakeholder input through participation in the GSMFC. GSMFC serves as a discussion center for marine resource issues, allowing stakeholders across all five Gulf States to voice concerns and opinions regarding fishery resource management. GSMFC meetings are open to the public and allow for public comment periods. Meeting dates, locations and agendas can be found on the GSMFC website.[15]

A number of associations are also instrumental in the management of the Texas shrimp industry, including the TSA, PASA, ASPA, SSA and Go Texan. TSA is a non-profit organization that aims to educate stakeholders (consumers, lawmakers, press, environmental groups, and the public) regarding the protection of Texas shrimp as an economically important product, while incorporating a sustainable, environmentally safe shrimp fishery.[16] Similarly, PASA is a nonprofit group in Port Arther that assists the commercial shrimp industry by holding trainings and

workshops.[17] ASPA represents and promotes the interests of domestic. U.S. Gulf shrimp processing industry through raising awareness in regards to Gulf shrimp quality and provide industry support.[18] SSA represents shrimp harvesters and other shrimp industry stakeholders across the Gulf and South Atlantic.[19] Go Texas – Texan Shrimp organizes industry members and represents their interests by promoting their business to consumers.[20]		

[1] "Gulf Council FAQs" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/resources/education_faqs/education_council_faqs.php

[2] "Scoping through Implementation" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/scoping-thru-implementation.php

[3] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[4] "Enhancing Transparency" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/management/recreational/policy/goal_4.html

[5] "Stock Status Updates" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html

[6] "Fishery Bulletin Archives" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/bulletin_archives/index.html

[7] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[8] Tex. Gov. Code § 551 http://www.statutes.legis.state.tx.us/SOTWDocs/GV/htm/GV.551.htm

[9] "TPW Commission Meetings" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/meetings/

[10] "TPW Commission Meetings" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/meetings/

[11] TPWD. Letter to Shrimp License Holders. November 20, 2014.

[12] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

[13] "Comment on Proposed Regulations and Transactions" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/business/feedback/public_comment/

[14] 31 T.A.C. §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

[15] *Gulf States Marine Fisheries Commission*. Web. Accessed September 2015. http://www.gsmfc.org/

[16] *Texas Shrimp Association*. Web. Accessed September 2015. http://www.texasshrimpassociation.org/

[17] Port Arthur Area Shrimpers Association. 1500 Jefferson Dr., Port Arthur TX 77642.

[18] *American Shrimp Processors Association*. Web. Accessed September 2015. http://www.americanshrimp.com/association/about/

[19] *Southern Shrimp Alliance*. Web. Accessed September 2015. http://www.shrimpalliance.com/about/

[20] "Texas Shrimp" *Go Texan*. Web. Accessed September 2015. http://www.gotexan.org/ExperienceGOTEXAN/GOTEXANShrimp/ShrimpSuppliers.aspx

7.1.3 (a) Where transboundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more states, do the states concerned cooperate to ensure effective conservation and management of the resources? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Gulf of Mexico shrimp fishery can be considered a transboundary fishery in the context that the fishery is prosecuted in all five U.S. states' territorial waters throughout the Gulf of Mexico, as well as in federal waters of the U.S. EEZ. Management of the Gulf of Mexico shrimp fishery is the responsibility of the Gulf of Mexico Fishery Management Council (GMFMC) and NOAA fisheries in waters from three nautical miles out to 200 nautical miles. Individual states maintain responsibility for management within state waters; therefore, TPWD is responsible for management of shrimp in Texas state waters out to three nautical miles. TPWD participates in the GMFMC and collaborates with other state and federal agencies on shrimp management in the Gulf. The Gulf of Mexico Fishery Management Council (GMFMC) is one of the regional Fishery Management Councils established by the Fishery Conservation and Management Act of 1976.[1] The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce. In addition, there are four nonvoting members representing the U.S. Coast Guard, U.S. Fish and Wildlife Service, Department of State, and the Gulf States Marine Fisheries Commission. GMFMC meets five times a year at various locations around the Gulf coast. Proposed rule changes are then submitted to NOAA Fisheries for further review and approval before implementation. Additionally, Texas is a member of the Gulf States Marine Fisheries Commission (GSMFC), which was established by Congress in 1949 (P.L. 81-66) as a compact of the five U.S. Gulf states.[2] GSMFC is charged with promoting "better utilization of the fisheries, marine, shell and anadromous, of the seaboard of the Gulf of Mexico, by the development of a joint program for the promotion and protection of such fisheries and the prevention of the physical waste of the fisheries from any cause." Three representatives from each of the five Gulf States sit on the Commission, including the head of each state's marine resource agency, a member of the		

legislature, and a citizen with knowledge of marine fisheries.[3] The Commission makes recommendations regarding the management of the fisheries to the governors and legislatures of the five Gulf States. These recommendations are based on scientific studies made by experts from both state and federal resource agencies, and on advice from law enforcement officials and representatives from the commercial and recreational fishing industries. <u>International:</u> There is a shrimp fishery prosecuted in Mexican waters in the Gulf of Mexico that harvests the same species (*Farfantepenaeus aztecus* and *Litopenaeus setiferus)*, but no formal management body exists across international boundaries in the Gulf of Mexico.[4] US-Mexico do collaborate on fishery management issues through the United States-Mexico Fisheries Cooperation Program, which is a bilateral consultative agreement that was informally agreed upon by the U.S National Marine Fisheries Service (NMFS) and the Mexican Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación (SAGARPA) in 1983.[5] Three memoranda of understanding (MOU) have been formalized through this relationship including the MEXUS-Golfo research program. Fishery Cooperation Talks (FCT) between NMFS and Mexico's National Commission of Aquaculture and Fishing (CONAPESCA) occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles, enforcement cooperation, aquaculture, collaborative research and participation in fisheries related international organizations.[6] For the purposes of management and assessments of shrimp, no detailed information is available for shrimp caught and and/or landed in Mexico; therefore, the Gulf of Mexico shrimp stocks are considered from the Mexican border to Florida and assessed accordingly. The SEFSC Galveston Lab shrimp research program includes an Information Transfer for Shrimp Fisheries' project. This project includes communications with Mexico Fishery Laboratories to enhance data collection and promote global stewardship of resources.[7]		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[3] "Commissioners List" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[4] FAO. "Shrimp fishing in Mexico" Global Study of Shrimp Fisheries. ftp://ftp.fao.org/docrep/fao/011/i0300e/i0300e02b.pdf

[5] Secretaria de Agricultura, Ganaderia, Desaorrollo rural, Pesca y Alimentacion (SAGARPA), 2012. Diario Oficial, Segunda sección, 24 de agosto de 2012. Actualización de la Carta Nacional Pesquera, 236 pp. http://www.inapesca.gob.mx/portal/documentos/publicaciones/CARTA%20NACIONAL%20PESQUERA/24082012%20SAGARPA.pdf

[6] NOAA. 2014. International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries. http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

[7] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

7.1.3 (b) Is there a formal fishery commission or arrangement to which all parties fishing belong? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
The GMFMC was established under the MSA for the management of fisheries in the U.S. EEZ.[1] This area begins where state waters end and extends out to the 200 nautical mile limit of the Gulf of Mexico. GMFMC consists of 17 voting members and four nonvoting members. GMFMC voting members consist of the Southeast Regional Administrator of the National Marine Fisheries Service, directors of the Gulf states marine resource management agencies, nominees and appointees from state governors and the Secretary of Commerce. Nonvoting members consist of representatives from the U.S. Coast Guard, U.S. Fish & Wildlife Service Department of State, and the GSMFC.[2] The GSMFC is a regional body made up of representatives from each of the five U.S. Gulf States to address state fisheries cooperation and fisheries that span state and federal boundaries. It is made up of 15 Commissioners, three from each Gulf state, who provide direction for policies, projects and associated budgets. One-third are appointed by the state legislatures, one-third are private citizens appointed by states' governors, and the remaining voting members are state fishery resource agency directors. Meeting locations and appointed officers rotate among the states so as to better represent the fisheries and coastal areas of the entire Gulf of Mexico.[3] Gulf fisheries are also managed through multiple sectors within NOAA Fisheries, all of which rely on cooperation and coordination with each Gulf state. NOAA Fisheries Gulf Branch within the Southeast Regional Office works with GMFMC to develop FMPs, implements regulations, guides fishery management measures, and coordinates public review and comment periods.[4] The NOAA Southeast Fisheries Science Center (SEFSC) manages multiple species in the Gulf, including shrimp.[5] NOAA SEFSC collects, analyzes, and manages both economic and biological data for Gulf shrimp species.[6] SEFSC is tasked with managing the Gulf Shrimp System, a shrimp data program specifically engaged in collecting statistical data from commercial harvesters.[7] The Galveston Laboratory assists NOAA SEFSC with shrimp research and management. The Galveston Laboratory is a research facility that assesses, manages, maintains and enhances Gulf fishery stocks. It specifically monitors Gulf shrimp stocks (and evaluates their impact on other fisheries) and provides shrimp data to reduce uncertainty in the fishery management plan process.[8] While Gulf states are not active members of the branches of NOAA Fisheries, their cooperation and coordination are heavily relied upon.[9]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[3] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[4] "Gulf of Mexico Fisheries" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/

[5] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[6] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[7] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[8] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[9] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

7.1.4 Do States which have a real interest in the fisheries or the resource outside their jurisdiction cooperate in the work of the relevant regional fisheries management organization or arrangement by becoming a member of such organization and arrangement and by actively participating in its work?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Each Gulf state is represented as Voting Members on the Gulf of Mexico Fishery Management Council (GMFMC), which prepares fishery management plans (FMPs) to manage fishery resources in the Gulf's EEZ.[1] Aside from their role as Voting Members, individual state agents may be called upon by GMFMC to serve on panels and committees.[1] State agencies that work in coordination with GMFMC are the Alabama Department of Conservation and Natural Resources Division, Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, Louisiana Department of Wildlife and Fisheries, Mississippi Department of Marine Resources, and Texas Parks and Wildlife Department.[2] Gulf fisheries are also managed through multiple sectors within NOAA Fisheries, all of which rely on data supplied by each Gulf state. NOAA Fisheries Gulf Branch within the Southeast Regional Office works with GMFMC to develop FMPs, implement regulations, guides fishery management measures, and coordinates public review and comment periods.[3] The NOAA Southeast Fisheries Science Center (SEFSC) manages multiple species in the Gulf, including shrimp.[4] NOAA SEFSC collects, analyzes, and manages both economic and biological data for Gulf shrimp species.[5] SEFSC is tasked with managing the Gulf Shrimp System, a shrimp data program specifically engaged in collecting statistical data from commercial harvesters		

through port agents.[6] The Galveston Laboratory assists NOAA SEFSC with shrimp research and management.[7] The Galveston Laboratory is a research facility that assesses, manages, maintains and enhances Gulf fishery stocks. It specifically monitors Gulf shrimp stocks (and evaluates their impact on other fisheries) and provides shrimp data to reduce uncertainty in the fishery management plan process. All five Gulf states contribute to this effort through NOAA Fisheries' port agent data collection system and observer programs.[8] **Gulf States:** The Gulf States Marine Fisheries Commission (GSMFC) is an organization of the five Gulf states that works together to conserve, develop, and fully utilize fishery resources.[9] Each Gulf state is represented equally as GSMFC Commissioners, which set policy, approve budgets, and direct GSMFC activities. GSMFC serves as a discussion center for marine resource issues, allowing states to voice concerns and opinions regarding fishery resource management. GSMFC also serves as an avenue for coordination of state and federal agency programs related to fishery management and decisions. **Texas:** Texas is a member of both GMFMC and GSMFC, and maintains representatives on subcommittees and advisory panels of each organization.[10,11] TPWD staff members also participate in research conducted by each organization (explained in more detail below). Texas also contributes fishery dependent data to NOAA Fisheries.[12]		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] "Links" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/links/index.php

[3] "Gulf of Mexico Fisheries" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/

[4] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[5] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[6] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[7] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[8] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[9] *Gulf States Marine Fisheries Commission*. Web. Accessed September 2015. http://www.gsmfc.org/

[10] "Commissioners List" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015.

http://www.gsmfc.org/#:content@10:links@11

[11] "Committee Members" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/panels_committees/index.php

[12] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

7.1.4 (a) Do all parties attend meetings and collect data in the specified format?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Representatives from Texas (and other Gulf States) serve on GMFMC and its subcommittees.[1] GMFMC meets five times a year in full session and subcommittees meet as needed based on specific project requirements.[2] Through the management of NOAA Fisheries SEFSC and Galveston Laboratory, the Gulf Shrimp System, established in 1960, is a thorough, consistent data collection system which has provided the NOAA Fisheries Galveston Laboratory scientists with statistical information needed to conduct assessments of the commercial shrimp fishery.[3] Port agents collect shrimp fishery data related to pounds of shrimp harvested, value of the catch, size composition, and fishing effort. Trip ticket data provided by each state is verified against port agent sampling data and integrated into the GSS. Port agents have collected these data for decades in a very similar format, allowing for consistent, reliable scientific analysis of the commercial shrimp fishery. Each Gulf State (including Texas) provides data to NOAA port agents in this specific format. This program monitors Gulf shrimp stocks (and evaluates their impact on other fisheries) and provides much needed data to reduce uncertainty in the fishery management plan process. The Galveston Laboratory utilizes port agent data to assist in numerous scientific projects associated with the Gulf shrimp fishery. NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states. Information gathered from this survey helps determine economic trends of the industry and helps understand the social and economic impacts regulation changes may have on the fishery and communities.[4] NOAA Fisheries data are also gathered through observer programs. The Shrimp Bycatch Reduction Device Evaluation Research is an observer program organized and conducted through the Galveston Laboratory and is part of the National Observer Program run by NOAA.[5] This project consists of onboard monitoring and scientific data analysis. This program evaluates the use of TEDs and 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 on the shrimping industry. All five Gulf states contribute to this effort.

Texas:

Representatives from Texas (and other Gulf States) also sit on the GSMFC and its advisory committees, attend full commission meetings twice annually, and frequent ad hoc committee meetings as needed.[6,7] TPWD staff participate in and provide data for the following GSMFC programs, among others:[8,9,10,11,12]

- Fisheries Information Network (FIN)
- Interjurisdictional Fisheries Program (IJF)
- Fisheries Economic Data Program
- Southeast Area Monitoring and Assessment Program (SEAMAP)

Each program works to standardize the format of the data collection process based on program needs and coordinates with state agencies and other partners to carry out that process. Due to the independent development of each states' scientific monitoring programs, some sampling methods are not fully standardized across the region; however, similarities in protocols and type of data collected allow for standardization.

GSMFC recently completed an inshore shrimp fleet data collection program within their Fisheries Economic Data Program to better understand economic performance of the inshore fishery and economic impacts of potential management changes.[13] GSMFC collected data from inshore vessels throughout the five Gulf states. Data consisted of revenue, operating costs, annual expenditures, employment, and vessel characteristics. This information was used to publish multiple reports regarding the economic characteristics of the shrimp industry.

TPWD's Coastal Fisheries Division conducts year-round monitoring programs to gather specific data for management purposes. Specifically for the shrimp industry, these data are used to determine season openings.[14,15] TPWD representatives attend collective Gulf State meetings and assist in the data collection efforts detailed above.

[1] "Committee Members" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/panels_committees/index.php

[2] "Meetings" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/council_meetings/index.php

[3] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[4] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[7] "Commissioners List" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[8] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[9] "Fisheries Information Network (FIN)" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/fin.php

[10] "Interjurisdictional Fisheries Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/ijf.php

[11] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[12] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[13] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[14] TPWD Press Release, May 6, 2015, "Gulf Shrimp Season Closing on Friday, May 15th" https://tpwd.texas.gov/newsmedia/releases/?req=20150506a

[15] Parks and Wildlife Department Coastal Fisheries Division Records, 1951-1999, 2004-2009 http://www.lib.utexas.edu/taro/tslac/20157/tsl-20157.html

7.1.4 (b) Is the population analysis updated regularly and in cooperation by a scientific group?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries, tasked with conducting research on the Gulf shrimp fishery, analyzes shrimp populations regularly. The NOAA SEFSC manages multiple species in the Gulf, including shrimp. NOAA SEFSC collects, analyzes, and manages both economic and biological data for Gulf shrimp species.[1] NOAA SEFSC Galveston Lab is tasked with managing the GSS, a shrimp data program specifically engaged in collecting statistical data from commercial harvesters through port agents (see 7.1.4(a) for details on GSS). The Galveston Laboratory also assists NOAA SEFSC with shrimp research and management by specifically monitoring Gulf shrimp stocks (and evaluates their impact on other fisheries) and providing shrimp data to reduce uncertainty in the fishery management plan process.[2] The Galveston Laboratory assesses, manages, maintains, and enhances the shrimp stock by analyzing fishery dependent landings and independent catch statistics, evaluating FMPs and regulations, developing models to forecast future landings, and monitoring industrial activities which may adversely impact the shrimp stock.[3] Port agents collect data needed to complete stock assessment modeling and monitoring, analyze trends of EEZ closures, develop models to assess impacts of closure options, monitor shrimping effort trends and effects on non-target species, and develop ecosystem		

based fishery models.[3] NOAA fishery scientists have established five research projects that utilize port data to accomplish the objectives of the Shrimp Fishery Research Program:[4]

- Shrimp Management: The objective of this project is to determine federal management impacts on the fishery and evaluate alternative management regulations to potentially increase economic growth.
- Shrimp Stock Assessment: The objectives of this project are to monitor trends in the shrimp fishery, conduct annual stock assessments, evaluate management options, and develop more reliable stock assessment models.
- Information Transfer for Shrimp Fisheries: The objective of this project is to ensure that the best available scientific knowledge is available to fishery managers and decision makers, which is accomplished through data exchanges, meetings, workshops, symposia, cooperative research, and publications.
- Forecasting Shrimp Harvests: The objective of this project is to produce annual forecasts for brown shrimp harvests (Texas and Louisiana) and pink shrimp harvests (off Florida) to aid management agencies in adjusting measures throughout the year.
- Revision of Trophic Model of Assessment of Ecological Interactions Among Shrimp and Bottomfish Assemblages: The objective of this project is to update a trophic ecosystem model that is used in assessing the impacts of trawl bycatch mortalities on trophic structure/ecology, nutrient cycling, and fishery yields of shrimp and finfish.

In most cases, the stock assessment will be prepared by NOAA Fisheries assessment biologists; however, occasionally, the assessment may be prepared by a state agency or by a university or independent assessment biologist under contract to NOAA Fisheries or a state agency.[5] Stock assessments for popular shrimp species were recently completed in 2014 (including data through 2013).[6]

The Scientific and Statistical Committee (SSC), made up of experts and scientists, also advises GMFMC.[8] The SSC helps determine research priorities for GMFMC and submits these priorities to NOAA SEFSC.[7]

Texas:

TPWD is responsible for managing the Texas shrimp fishery in inshore waters.[8] TPWD has not completed a quantitative assessment of shrimp in Texas waters since the stock is assessed by NOAA for each shrimp species throughout its range, which includes the entire Gulf of Mexico. However, TPWD continually monitors the shrimp populations through their Coastal Fisheries Division. This Division conducts year-round monitoring programs to gather specific data for management purposes. Specifically for the shrimp industry, data are gathered to assess population levels.[9] The fishery population is also monitored via the Trip Ticket Program.[10]

[1] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] NMFS. 2014 Status of U.S. Fisheries Stock Assessments and other Sources that support Status Determinations. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2014/stockassessments_2014_rtc.pdf

[7] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[8] TPWD. *Executive Summary, The Texas Shrimp Fishery*. September 2002 http://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_v3400_857.pdf

[9] Texas Parks and Wildlife Department: Coastal Fisheries Division Records, 1951-1999, 2004-2009. Web. Accessed September 2015. http://www.lib.utexas.edu/taro/tslac/20157/tsl-20157.html

[10] "Commercial Harvest Reporting/Trip Ticket Program" *Texas Parks and Wildlife Department*. Web. Accessed September 2015. https://tpwd.texas.gov/fishboat/fish/commercial/tripticket.phtml

7.1.4 (d) Are scientific recommendations of groups reflected in the regulations?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC maintains a Standing SSC and Special SSC's for individual management units to provide scientific advice to the Council. The SSC is responsible for advising the Council on the adequacy of scientific information and analyses for proposed management measures and alternatives. The SSC reviews FMPs and amendments, including environmental impact statements, environmental assessments, and regulatory impact reviews and provides a determination of whether these are based on the best scientific evidence available. Additionally, NS1 mandates that annual catch limits (ACLs) set by the Council cannot exceed the recommendations of the SSC.[1] The Shrimp FMP and amendments form the basis for the regulations that are promulgated through the Code of Federal Regulations (CFR) by NOAA Fisheries.[2] Title 50 of the CFR, Part 622, Subpart C contains the regulations for the shrimp		

fishery of the Gulf of Mexico.[3] These regulations reflect the scientific recommendations made through the GMFMC process. **<u>Texas</u>:** Texas regulations also reflect the scientific recommendations made by TPWD biologists, as well as recommendations by GMFMC and GSMFC. Season dates for the shrimp fishery are determined annually, based on scientific data provided by the Coastal Fisheries Division independent sampling program, to protect juvenile shrimp until they have reached a size to allow for reproduction before entering the fishery.[5] Other regulations for the inshore shrimp fishery include area closures to protect nursery habitat, as recommended by GMFMC, and gear restrictions to reduce impacts to habitat and the ecosystem.[6]		

[1] GMFMC, 2012. Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[3] 50 CFR §622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] TPWD. Press Release, May 6, 2015, "Gulf Shrimp Season Closing on Friday, May 15th" https://tpwd.texas.gov/newsmedia/releases/?req=20150506a

7.1.4 (e) Are the regulations respected by the parties concerned? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Regulations promulgated through the Code of Federal Regulations (CFR) are required by law for all participants fishing in the U.S. EEZ and are enforced by NOAA Fisheries Law Enforcement and the U.S. Coast Guard (USCG) Living Marine Resources division.[1,2,3] Regulations made by GMFMC are respected by the individual states and state regulations for territorial waters are consistent with federal regulations.[4] Each of the five Gulf States has a Joint Enforcement Agreement (JEA) with NOAA Fisheries through the Cooperative Enforcement Program which allows U.S. state conservation law enforcement officers to enforce federal laws and regulations pertaining to marine resources and endangered species.[5]		

[1] 50 CFR §622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

7.1.6 (a) Should representatives from relevant organizations, both governmental and non-governmental, concerned with fisheries be afforded the opportunity to take part in meetings of subregional and regional fisheries management organizations and arrangements as observers or otherwise, in accordance with the procedures of the organization or arrangement concerned? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
GMFMC meetings are open to public and allow public comment periods.[1] Meeting dates, locations and agendas are publicized prior to the meeting date. The GMFMC also holds public hearings throughout the region when specific rule changes are proposed. These meetings are also made available through webinar access on the Council website.[2] GSMFC meetings are also open to the public and allow public comment periods. Meeting dates, locations and agendas can be found on the GSMFC website.[3]		

[1] "Meetings" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/council_meetings/index.php

[2] "Watch our meetings live" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/Webinars.php?utm_source=Standing+and+Special+SSC+Meeting+8%2F14&utm_campaign=SSC+8-14&utm_medium=email

[3] *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

7.1.6 (b) Subject to the procedural rules on access, are such representatives given timely access to the records and reports of such meetings? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
The GMFMC meeting agendas, meeting minutes, transcripts, scientific reports and other publications are made available online through their website and are also available in writing through public records requests.[1] The GMFMC also provides briefing materials through their website for committee members and general public to access prior to each meeting.[2] Timelines vary for documents posted in briefing folders depending upon the project but are typically posted a few weeks prior to the meeting for documents being referenced. Meeting minutes from the most recent prior council meeting appear in the briefing folder for the next upcoming council		

meeting (council meetings occur five times a year and generally fall about two months apart.) GSMFC publishes reports and assessments as soon as possible once approved by the Commission. These reports are posted online in the publications area of the GSMFC website.[3] Notification of availability is sent to newspapers and local media as well as posted on GSMFC and state agency social media and web pages and is announced in the GSMFC quarterly newsletter. Meeting minutes and records are compiled into a 'draft minutes book' twice a year after both the Spring and Fall annual meetings and sent to the Commissioners and meeting participants within 2-3 months. All GSMFC meeting minutes are collated by year and published annually on the website. Documents that are not immediately available on the website can be requested directly from GSMFC and are typically provided within one week of the request.		

[1] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[2] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[3] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

7.1.7 (a) Have mechanisms been established for fisheries monitoring, surveillance, control and enforcement to ensure compliance with their conservation and management measures for the fishery in question? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
MONITORING: Federal: The SEFSC Fisheries Monitoring Branch monitors the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (see response to 7.1.4(a) for details on the GSS).[2] Furthermore, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data.[3] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program. The ELB program began in 2007 and between 2007 and 2013, NOAA Fisheries funded and collected data on approximated 500 shrimp vessels through the program.[4]		

The ELB program collects data on the amount and location of shrimp harvested. This allows both total fishing effort and catch-per-unit effort to be estimated for various shrimping locations, time periods, and vessels. Data from the program is also utilized to generate mortality estimates for a number of bycatch species including red snapper and incidental take of sea turtles. In 2014, improvements in technology prompted the program to change format to a cELB program. Utilizing cellular networks, data are now automatically uploaded and transmitted to the Galveston Laboratory when the vessel enters into cellular range. The program continues to use a stratified random sampling method to select participants each year with coverage on approximately one third of the fleet at any given time. If selected, Gulf shrimp permit holders are required to participate and permit renewal is contingent upon participation.

Gulf shrimp permit holders are also required to carry an observer if selected for the Observer Program run by the Galveston Laboratory. Similar to the ELB program, permit holders are selected by the Southeast Regional Director (SRD) through a stratified random sampling method. The focus of data collection for the Observer Program for the shrimp fishery is bycatch data collection and BRD/TED evaluation.[5,6] 50 CFR 622.52 requires any vessel with a Gulf commercial shrimp permit, if selected by the SRD, to carry a NOAA Fisheries-approved observer and allow the observer free and unobstructed access to the vessel's bridge, working decks, holding bins, weight scales, holds, and any other spaces used to hold, process, weight or store fish.[7]

50 CFR 622.51 requires the following reporting activities for the Gulf of Mexico shrimp fishery:[8]

1- General Reporting: commercial vessel owners and operators are required to provide information for any fishing trip, when requested by the SEFSC Science and Research Director, including vessel identification, gear, effort, amount of shrimp caught by species, shrimp condition, fishing areas and depths, and person to whom sold.
2- Electronic Logbook Reporting: vessel owners with a federal Gulf shrimp commercial vessel permit may be selected by the SRD and must participate in the electronic logbook reporting program sponsored by NOAA Fisheries. Compliance with these reporting requirements is required for permit renewal.
3- Vessel and Gear Characterization Form: all vessel owners/operators must complete and annual Gulf Shrimp Vessel and Gear Characterization Form when applying for permit renewal. Compliance with these reporting requirements is required for permit renewal.
4- Landings Report: the owner/operator of a Gulf commercial shrimp vessel with a federal permit must annually report the vessel's total annual landings of shrimp and value, by species. These data are collected annually from all permit holder using the ALF and compliance with these reporting requirements is required for permit renewal.
5- Gulf shrimp dealers: a person who purchases shrimp from a vessel, or person, that fishes for shrimp in the Gulf EEZ or adjoining state waters, or lands

shrimp in an adjoining state must provide the following information upon request by the SRD:

a. Name and number of vessel from which the shrimp was received
b. Amount of shrimp received, by species and size category for each receipt
c. Ex-vessel value, by species and size category, for each receipt

NOAA Fishery-Independent resource surveys are conducted through the SEFSC Mississippi Labs. Shrimp/Bottomfish surveys are conducted each Fall and Summer, which are designed to provide a time-series for monitoring trends in resource abundance.[9] Surveys conducted by NOAA are part of the SEAMAP regional sampling program, coordinated through GSMFC, providing independent data to enhance scientific evidence used in management decisions.[10] The Summer and Fall SEAMAP Shrimp/Groundfish Surveys are designed to monitor size, abundance, and distribution of demersal species, including penaeid shrimp, in the northern Gulf of Mexico from inshore waters out to 60 fathoms.[11] Sampling is conducted across all five U.S. Gulf states using standardized methodologies and records data on all species caught and environmental parameters at each sampling site. All data from SEAMAP surveys is entered into the SEAMAP Information System, which contains a consistent dataset, starting in 1982, and data are available to all participating agencies and to the public upon request.

Texas:
TPWD maintains rigorous monitoring programs for both fishery-dependent and fishery-independent data collection.[12,13] The independent resource sampling program is a stratified cluster sampling design that utilizes gill nets, bag seines, and trawls to determine relative abundance, size, life history stages, species composition, temporal and spatial distribution of fish and shellfish throughout all habitats of coastal Texas waters.[14] Gill net sampling is conducted seasonally with sampling distributed over a ten week period each spring and fall. Bag seine and trawl samples are conducted monthly with samples distributed evenly between each half of the month. The Trip Ticket Program gathers commercial harvest data that is reported on a per trip basis and submitted to TPWD monthly.[15] These programs ensure constant monitoring of fishery resources.

CONTROL:
Federal:
The Gulf of Mexico shrimp fishery is managed by the GMFMC and NOAA fisheries and has regulations in place for entry into the fishery, methods of take, seasonal and area closures and gear requirements.
Federal regulations promulgated through 50 CFR 622 include:[16]

- Moratorium permits required. Any vessel fishing for shrimp in the Gulf of Mexico EEZ must have been issued a moratorium permit. No new permits have been added to the fishery since 2005. Permits may be transferred. Permits not renewed are terminated and will no longer be issued for the fishery.
- Permit renewals are contingent on compliance with all reporting requirements

- A NOAA certified bycatch reduction device (BRD) is required in each net that is rigged for fishing.
- Closure areas:
    - Texas Closure: from May 15-July 15 each year trawling is prohibited in the EZZ off Texas
    - Southwest Florida seasonal trawl closure from January 1through May 20 each year
    - The Tortugas shrimp sanctuary (off the Florida coast) is completely closed to trawling
    - Potential closures of the Gulf fishery, determined annually, based on the need for reduction in red snapper bycatch
    - Shrimp/Stone crab separation zones to prevent gear conflicts between the two fisheries

Texas:
The Texas shrimp fishery has strict regulations in place for entry into the shrimp fishery, methods of take for both recreational and commercial fishermen and required reporting of landings.

The Inshore Bay and Bait Shrimp License Buyback Program was implemented in Texas in 1995, and the Texas Gulf Shrimp License Moratorium went into effect in 2005.[17,18] These programs created a limited entry systems for the shrimp fishery and set rules to establish eligibility requirements, provisions for transfer, number of licenses an individual may possess and license requirements when shrimping.[19]

Regulations on method of take for commercial, bait and recreational shrimping are established by the Statewide Hunting and Fishing Proclamation and include restrictions on legal gear types, gear requirements, and closure areas and seasons.[20] Full details on commercial shrimp regulations can be found in the Texas Commercial Fishing Guide.[21]

The Trip Ticket Program went into effect in Texas in 2006 replacing the previous fishery dependent data collection system, the MAPR. The current Trip Ticket Program was implemented to collect harvest data on a trip basis for commercial landings. Data are reported by seafood dealers, wholesalers, or directly by fishermen if they sell direct to an individual, restaurant, or retailer. Data collected includes species harvested, ex-vessel value, area fished, gear type and fishermen's identification information.[22]

SURVEILLANCE AND ENFORCEMENT:
Federal:
Enforcement of federal fishing regulations is coordinated through NOAA Fisheries Office of Law Enforcement (OLE) and occurs in partnership with the U.S. Coast Guard (USCG) and state agency law enforcement divisions.

NOAA Fisheries OLE plays a direct role in enforcing fishery regulations and protection of marine wildlife and habitat by enforcing domestic and international laws

which are "designed to ensure these global resources are available for future generations."[23] NOAA agents and enforcement officers are responsible for ensuring compliance with national marine resource laws and take action if laws are violated. NOAA Fisheries Law Enforcement is responsible for enforcing laws and statutes that fall under the Magnuson-Stevens Fishery Conservation Act, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Lacey Act and the National Marine Sanctuaries Act. NOAA Office of General Counsel is the civil prosecutor, and the U.S. Department of Justice and the U.S. Attorney's Office serve as legal advisors and prosecutorial partners in criminal cases. NOAA agents conduct patrols by air, land, and sea, board vessels, conduct investigations, and inspect processing facilities. NOAA also works closely with the U.S. Coast Guard (USCG) as the nation's leading maritime law enforcement agency and NOAA's main enforcement partner. The USCG is the only military organization within the Department of Homeland Security and is responsible for safeguarding U.S. maritime interests and environment.[24] The USCG is present on local, regional, national and international levels and is a significant tool to ensure maritime safety, security and environmental stewardship. The USCG is responsible for enforcing federal fisheries laws and regulations as well as marine safety and marine environmental protection laws. The Living Marine Resources division has three main priorities:[25]

- preventing illegal foreign fishing operations from entering the U.S. EEZ
- Enforcing domestic fisheries law
- International fisheries agreement development and enforcement.

<u>Texas:</u>

TPWD Law Enforcement Division (LED) is responsible for statewide law enforcement to protect the wildlife, other natural resources and the environment of Texas.[26] The LED also provides safe boating and recreational water safety on public waters. Texas Game Wardens are the agents responsible for the enforcement of Texas regulations and laws pertaining to wildlife as determined by the Parks and Wildlife Code, TPWD regulations, the Texas Penal Code and other statutes and regulations regarding clean air and water, hazardous materials and human health. [27] Specific violations related to blue crab and the associated regulations can be found on the TPWD website under Fishing Violations, Section E.[28] TPWD LED actively monitors the blue crab fishery, issues citations for violations and maintains records of violations and repeat offenses.[29,30]

Texas also has a Joint Enforcement Agreement (JEA), which is a partnership between the National Oceanic and Atmospheric Administration's NMFS and TPWD on enforcement related activities. The Cooperative Enforcement Program of GSMFC develops Cooperative Enforcement Agreements (CEA).[31] CEAs authorize state marine law enforcement officers to enforce federal laws and regulations. JEAs are formal operations that provide funding to state and territorial law enforcement agencies to perform law enforcement of federal regulations.[32]

[1] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[2] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[3] 2010 Analysis of Gulf Shrimp Moratorium Permits, NOAA.

[4] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "National Observer Program: Shrimp" *NOAA Office of Science and Technology*. Web. Accessed November 2015. https://www.st.nmfs.noaa.gov/observer-home/regions/southeast/shrimp

[7] 50 CFR §622.52 http://www.gpo.gov/fdsys/granule/CFR-2013-title50-vol12/CFR-2013-title50-vol12-sec622-52

[8] 50 CFR §622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[9] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[10] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 15 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[11] "SEAMAP Gulf of Mexico Resource Surveys" *Southeast Area Monitoring and Assessment Program*. Web. Accessed Nov. 2015. http://www.gsmfc.org/seamap-gomrs.php

[12] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[13] TPWD. Response to "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department" AFS, 2005. Unpublished Report.

[14] Steve VanderKooy (ed). 2013. GDAR01 Gulf of Mexico Blue Crab Stock Assessment Report (Gulf States Marine Fisheries Commission. Ocean Springs, MS. GSMFC Number 215, 2013) http://www.gsmfc.org/publications/GSMFC%20Number%20215.pdf

[15] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[16] 50 CFR §622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[17] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[18] Tex. Parks & Wild. § Code 77.151 http://codes.findlaw.com/tx/parks-and-wildlife-code/parks-wild-sect-77-151.html

[19] Tex. Parks and Wild. Code § 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

[20] 31 Tex. Admin. Code § 57
http://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=5&ti=31&pt=2&ch=57&sch=N&div=3&rl=Y

[21] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015).
http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[22] 5 Tex. Admin. Code § 66.019 http://codes.lp.findlaw.com/txstatutes/PW/5/B/66/A/66.019

[23] "Enforcement" *NOAA Office of General Council*. Web. Accessed June 2015. http://www.gc.noaa.gov/enforce-office.html

[24] *United States Coast Guard*. Web. Accessed June 2015. http://www.uscg.mil/top/about/

[25] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015.
http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[26] "Law Enforcement Division" *Texas Parks and Wildlife Department*. Web. Accessed June 2015.
http://tpwd.texas.gov/business/about/divisions/law_enforcement/

[27] "Texas Game Wardens" *Texas Parks and Wildlife Department*. Web. Accessed June 2015.
http://www.tpwd.texas.gov/warden/

[28] "Fishing Violations" *Texas Parks and Wildlife Department*. Web. Accessed June 2015.
http://www.tpwd.texas.gov/warden/fishing

[29] TPWD. "Law Enforcement Report. Crab Violations 2010 – Present" Unpublished Report. September 2014.

[30] TPWD, "Law Enforcement Report. Crab Violations, Repeat Offenders 2010-Present. Unpublished Report. September 2014.

[31] "Cooperative Enforcement Program" Gulf States Marine Fisheries Commission. Web. Accessed June 2015.
http://www.gsmfc.org/#:content@11:links@12

[32] National Marine Fisheries Service, *Cooperative Enforcement Program, Program Manual 2012*. (NOAA, 2012).
http://www.nmfs.noaa.gov/ole/docs/2012/2012_program_manual.pdf

7.1.7 (b) Have these measures proved effective? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries OLE produces Quarterly reports by region to report on enforcement activities, which includes details on violations issues under each federal act enforced by NOAA agents and reports activities of each of the JEAs for states within that region. The FY15 First Quarter Report reflects active monitoring of fisheries in the Southeast Division with 58 total incidents including 25 incidents reported in violation of the MSA, 4 incidents of the endangered species act, 10 incidents of the Marine Mammal Protection Act.[1] OLE also maintains a current listing of enforcement actions on its website, and an archived listing of enforcement news reporting OLE program activities.[2,3]		

The Annual Review of the United States Coast Guard's Mission Performance (2013) report provides details of USCG activities for each division, including marine living resources.[4] According to this report, USCG spent 93,004 resource hours on living marine resources activities and compliance with fishing regulations remains above 97% (see chart below).

Performance Measures and Results: The USCG uses the percentage of fishing vessels observed at sea complying with domestic regulations as a measure of its impact on enforcement of U.S. fisheries and protected species regulations. The measure reflects the percentage of USCG boardings at sea where no significant violations of domestic living marine resources regulations were detected. As shown in the following chart, the USCG reported that it met its fishing regulation compliance rate living marine resources performance measure in FY 2013.

Living Marine Resources			
Performance Measure – Fishing Regulation Compliance Rate			
FY 2011 Actual	FY 2012 Actual	FY 2013 Target	FY 2013 Actual
97.4%	98.3%	96%	98.1%
√ Met	√ Met		√ Met

Source: DHS OIG based on USCG-provided data.

Texas:

The TPWD Annual Report reflects successes of the LED including statistics on miles and areas patrolled, boat hours, arrests made for various violations including boating safety and fishery regulation, and number of interactions with game wardens. In 2008, TPWD LED conducted 11,234,793 miles of vehicle patrols, 131,888 hours of boat patrols, made 20,786 arrests pertaining to hunting and fishing regulation violations and 9,749 arrests for water safety violations and logged 3,364,096 individual contacts or interactions between game wardens and public users.[5] TPWD enforcement reports reflect active monitoring and citations for the shrimp fishery to ensure compliance of regulations.

[1] NOAA Fisheries. *Office of Law Enforcement FY15 First Quarter Enforcement Report*. July 2013. http://safmc.net/sites/default/files/Regulations/pdf/NOAAOLE_Q1_2015_PublicReport_Final.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "News Archive" *NOAA Fisheries Office of Law Enforcement.* Web. Accessed June 2015. http://www.nmfs.noaa.gov/ole/newsroom/08_news_archive.html

[4] Department of Homeland Security, Office of Inspector General. *The Annual Review of the United States Coast Guard's Mission Performance (2013)*. OIG-14-140. September 2014. https://www.oig.dhs.gov/assets/Mgmt/2014/OIG_14-140_Sep14.pdf

[5] Texas Parks and Wildlife Department. *2008 Annual Report* (TPWD, 2009). http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_e0100_003_01_09.pdf

7.1.8 (a) Have mechanisms been established to (identify, quantify) prevent or eliminate excess fishing capacity? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Kirkely et al. (2006) includes an analysis of the Gulf of Mexico shrimp fishery to determine the level of overcapacity and costs associated with reducing overcapacity within the fleet.[1] This analysis utilized the average annual yield of shrimp between 1981 and 2001 (101.6 million pounds) as an equivalent to MSY, and used this as the target level in determining the overcapacity of the fishery. The fishery was broken down into subgroups; capacity was determined for each division and then extrapolated to estimate total fleet level activity. Amendment 13 of the Gulf of Mexico Shrimp FMP established a 10-year moratorium on the issuance of commercial shrimp vessel permits capping the number of vessels in the federal fishery.[2] Amendment 13 notes that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource; however, economically the fishery has been operating at a negative profit margin, and a fewer number of vessels in the fishery would allow more profitable harvest of available shrimp resources. Amendment 13 also notes that, due to competition with foreign imports and rising fuel costs, the number of vessels in the fleet has declined and was expected to continue to decline until approximately 2012 when the number of participants reached a more profitable level. Since the implementation of the moratorium, license numbers have been reduced from 1933 permits in 2007 to 1470 permits in 2014.[3] The 10-year moratorium put in place by Amendment 13 expires in December of 2016 and the GMFMC is currently in discussions on the development of Amendment 17 to determine if the moratorium will expire, by extended, or development of a limited-access system will be put in place. Amendment 17 has been divided into two separate draft amendments: 17A and 17B. Amendment 17A will determine whether the moratorium will be extended, which is currently the preferred option in place. Amendment 17B is currently working to address the appropriate number of permits for the fishery.[4] A number of issues have been identified in the current draft of Amendment 17B that must be addressed in order to determine the most appropriate action. First, the number of vessels in the fleet have continued to decline due to economic hardships and there is concern that this trend will continue indefinitely. Second, the current OY for the fishery is defined as equal to MSY, but MSY is calculated for each species individually, not for the fishery as a whole (combined penaeid species). The goal of Amendment 17B is to define optimal yield for the fishery and determine the appropriate number of permits for the fishery based on this updated information. **Texas:** In 1995, the Texas Inshore Bay and Bait Shrimp License Buyback Program was implemented.[5] Due to increased effort in the inshore fisheries (Bay and Bait shrimpers), concern was raised about biological pressure on the stock and loss of larger shrimp to the Gulf and federal offshore fleets and a license limitation and		

buyback program was implemented with the goal of reducing inshore shrimping effort by 50%. The Shrimp License Management Program established limited-entry requirements for the Bay and Bait shrimp fisheries, established a voluntary buyback system, created definitions of flagrant offenses and license suspension and revocation penalties for violations, and limited vessel upgrade option to prevent increased effort under current licenses available.[6] When the program began, there were over 3200 licenses in the Bay and Bait fisheries; as of 2015, there are now less than 800 licenses, which has exceeded the target reduction goal of the program.[7] In 2005, a limited entry system was also implemented for Texas Gulf shrimp licenses in conjunction with the limited entry system established for federal waters by GMFMC.[8]		

[1] James E. Kirkley, John M. Ward, James Nance, Frank Patella, Karyl Brewster-Geisz, Chris Rogers, Eric Thunberg, John Walden, Will Daspit, Brad Stenberg, Steve Freese, Jim Hastie, Stephen Holiman, and, Mike Travis, 2006. *Reducing Capacity in U.S. Fisheries*. NOAA Technical Memorandum NMFS-F/SPO-76. http://spo.nmfs.noaa.gov/tm/tm76.pdf

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[4] GMFMC. *Draft options for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-%205%20Shrimp%2017b-%20OY%20and%20Permit%20Pool.pdf

[5] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[6] 31 Tex. Admin. Code §58.130 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=130

[7] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

[8] Tex. Parks & Wild. § Code 77.151 http://codes.findlaw.com/tx/parks-and-wildlife-code/parks-wild-sect-77-151.html

7.1.8 (b) Have these measures proved effective? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The moratorium put in place by Amendment 13 capped the number of licenses in the fishery to the number of qualifying permits that were issued in the first year of the moratorium: 1,933 permits.[1] Since 2007, permit numbers have decreased to 1470 permits in 2014 through termination of permits that were not renewed by the permit holder.[2]		

Texas: When the Texas Inshore Bay and Bait Shrimp License Buyback Program was implemented in 1995, there were over 3200 licenses in the Bay and Bait fisheries; as of 2015, there are now less than 800 licenses, which has exceeded the target reduction goal of the program.[3,4] The Texas Gulf shrimp license moratorium, implemented in 2005, has also led to a reduction in Gulf licenses since licenses that are not renewed or transferred as removed from the fishery.[5]		

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[3] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[4] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

[5] Tex. Parks & Wild. § Code 77.151 http://codes.findlaw.com/tx/parks-and-wildlife-code/parks-wild-sect-77-151.html

7.1.9 Are the arrangements followed for assessment, management of the fishery and the decision-making process in general transparent?

(i) - Assessment **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
Federal: The GMFMC observes the utmost transparency with regard to their FMP and amendments via their website, open meetings, and public comment policies. While GMFMC plays a major role in the management of the Gulf shrimp fishery, it relies heavily on assessment data from NOAA Fisheries. NOAA Fisheries is responsible for assessing and managing Gulf shrimp fisheries.[1] Gulf shrimp stock assessments are conducted annually by the NOAA SEFSC Galveston Laboratory. To perform these stock assessments, NOAA Fisheries utilizes data from port agents, state trip ticket programs, electronic logbooks (ELB) and observer programs. Information about these data gathering programs is published on the Galveston Laboratory website.[2] While the actual data from the ELB program are not published, permit holders and vessel operators can request copies of their ELB GPS data. These data are used by NOAA Fisheries and GMFMC to assess the status of shrimp stocks.[3] NOAA Fisheries SERO website contains the Gulf of Mexico Shrimp FMP and each amendment.[4] NOAA SEFSC published the Economics of the Federal Gulf Shrimp Fishery Annual Report on their website, supplying the public with the most recent assessments of the financial and economic status of the fishery.[5] Stock		

assessments for the penaeid shrimp specie are conducted annually and reviewed by the GMFMC SSC and Standing Shrimp SSC for approval. The most recent assessments are posted on the Galveston Website.[6]

Gulf States:
The GSMFC also plays a role in the Gulf shrimp fishery's assessment process, and does so transparency. GSMFC organizes state supplied data to create regional reports. Once approved by their Commission, GSMFC publishes reports in the publications area of their website.[7] Notification of availability is sent to newspapers and local media as well as posted on GSMFC and state agency social media and web pages.[8] GSMFC assessment programs specific to the shrimp industry include the Southeast Area Monitoring and Assessment Program (SEAMAP) Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[9,10] SEAMAP Gulf of Mexico Resource Surveys assess the shrimp fishery through the Summer and Fall Shrimp/Groundfish Surveys. The Fisheries Economic Data Program published peer-reviewed economic reports in 2014.[11,12] These reports assessed the economic landscape of the shrimp industry, providing revenue, operating cost, annual expenditure, employment, and harvesting/harvester data. Both the SEAMAP and the Fisheries Economic Data Program examples follow the transparency and publication practices of GSMFC listed above.

GSMFC recently developed a website, Gulf FINFO, which also contains information on the shrimp fisheries of the Gulf of Mexico.[13] The site summarizes management practices, biological information, assessment and monitoring activities, and harvest data and contains links to population assessments and other relevant documents.

Texas:
The TPWD and the TPWC are responsible for managing the shrimp fisheries in marine waters of the State of Texas. TPWC considers scientific recommendations from TPWD and industry concerns through their commercial fishing representative as they determine season openings and other management measures for the Texas shrimp fishery. TPWC holds an annual public hearing in August to gain feedback from stakeholders on issues related to TPWD's policies, programs, goals, and responsibilities.[14] Per the requirement of the TX Open Meetings Act, information regarding meeting date, time, location, and purpose is publically posted via the TPWD website at least 72 hours prior to the meeting and a must be physically posted and accessible to the public during normal business hours.[15] TPWD posts proposed rules and public notices on their website, and allows for written comment by mail or email.[16] When the public voices concerns and makes suggestions regarding the shrimp industry, TPWD conducts hearings to discuss potential regulation changes with stakeholders. TPWD held a recent public hearing for the shrimping industry, as there have been proposed regulations changes from the commercial fishermen regarding count/size requirements in certain bays and inland waters. This meeting was held in April 2015.[17]

TPWD maintains manuals to ensure proper procedure for sampling and assessments, and conducts an annual review process of scientific data reports for

each fishery to determine management decisions. See review process outline provided by TPWD.[18]		

[1] *FishWatch*. Web. Accessed November 2015. http://www.fishwatch.gov/

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] "SPGM Electronic Log Book" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/

[4] "Gulf of Mexico Shrimp Rulemakings" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/rules/gulf/shrimp/index.html

[5] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[6] NMFS. 2014 Status of U.S. Fisheries Stock Assessments and other Sources that support Status Determinations. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2014/stockassessments_2014_rtc.pdf

[7] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[8] "Recent News from the Gulf States" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/news.php

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[11] Miller, Alexander, Maryam Tabarestani, and Jack Isaacs. 2014. *A Survey of Recreational Shrimpers in the Northern U.S. Gulf of Mexico*. Gulf States Marine Fisheries Commission Publication, Publication Number 228. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20228.pdf

[12] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[13] *Gulf FINFO*, Web. Accessed June 2015. http://gulffishinfo.org/Species?SpeciesID=102

[14] "Commission Meetings" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/business/feedback/meetings/

[16] Tex. Gov. Code § 551 (Open Meetings Act) http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.551.htm

[17] "Opportunities for Comment" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/public_comment/

[18] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

[19] Texas Parks and Wildlife Department. *Review Process Procedures*. Unpublished document.

7.1.9 (ii) - Management **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
Federal: GMFMC manages the Gulf shrimp fishery resources through the Shrimp FMP. This plan, implemented as federal regulation in 1981, is available to the public along with all amendments via the GMFMC website.[1] These amendments are the result of a transparent five step process that includes scoping, public hearings, final action, rule making and implementation.[2] GMFMC meetings are open to the public and allow for public comment periods.[3] Meeting dates, locations and agendas are publicized prior to the meeting.[4] GMFMC also holds public hearings throughout the region when specific rule changes are proposed. These meetings are also made available through webinar access on the GMFMC website.[5] GMFMC meeting agendas, meeting minutes, transcripts, scientific reports and other publications are made available online through their websites and are also available in writing through public records requests.[6] GMFMC also provides briefing materials through their website for committee members and the general public to access prior to each meeting.[7] Timelines vary for documents posted in briefing folders depending upon the project but are typically posted a few weeks prior to the meeting. Meeting minutes from the most recent prior GMFMC meeting appear in the briefing folder for the next upcoming meeting (GMFMC meetings occur five times a year and generally fall about two months apart). NOAA Fisheries, along with GMFMC, is responsible for managing Gulf shrimp fisheries. Stock assessments are developed by the NOAA Fisheries Galveston Laboratory to aid in the management of the fishery.[8] NOAA Fisheries relies on communication with the public to enhance transparency and increase public confidence in management activities. NOAA Fisheries publishes public comments on their website each month. All reports, including their latest shrimp stock assessment reports, are always publically accessible via their website. **Texas:** Regulatory hierarchy in Texas for fishery management is as follows: - Governor -- State Legislature --- Texas Parks and Wildlife Commission (nine members, appointed by governor) ---- Texas Parks and Wildlife Department Executive Director ----- TPWD Deputy Executive Director, Natural Resources ------ TPWD Coastal Fisheries Division Director As governing bodies, TPWC and TPWD are subject to the Texas Open Meetings Act requiring transparency in how the Commission and the department make management decisions regarding wildlife.[9] TPWC meetings are open to the public, allow public comment, and transcripts are published after the meeting on the TPWD website.[10] Fishermen are active participants at Commission meetings and typically make public comment on proposed regulatory changes. Public records are also		

available for all government bodies, including TPWD as required by the Texas Public Information Act.[11] There is public participation throughout the decision-making process for proposed rule and regulation changes as required by Texas Government Code Chapter 2001 on Administrative Procedure.[12] TPWD typically conducts scoping meetings with industry members prior to proposed rulemaking and consults advisory committees consisting of industry representatives, such as the CRAC, for industry recommendations and support throughout the regulatory process.[13,14] TPWC will not take action on any proposed regulation until it has gone through a formal public comment period. Once action has been taken, adopted regulations are published in the *Texas Register* and disseminated through various media by TPWD.[15]		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] "Scoping through Implementation" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/scoping-thru-implementation.php

[3] "Meetings" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/council_meetings/index.php

[4] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[5] "Watch our meetings live" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/Webinars.php?utm_source=Standing+and+Special+SSC+Meeting+8%2F14&utm_campaign=SSC+8-14&utm_medium=email

[6] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[7] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[8] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[11] Tex. Gov. Code § 551 http://www.statutes.legis.state.tx.us/SOTWDocs/GV/htm/GV.551.htm

[12] "TPW Commission Meetings" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/meetings/

[13] Tex. Gov. Code § 552.021 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.552.htm#552.021

[14] Tex. Gov. Code § 2001.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.2001.htm

[15] 31 Tex. Admin .Code §51.622 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=5&p_dir=&p_rloc=121277&p_tloc=&p_ploc=&pg=1&p_tac=121277&ti=31&pt=2&ch=51&rl=622

[16] 31 T.A.C. §51.672
http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

[17] "Texas Register" The Portal to Texas History. Web. Accessed June 2015.
http://texashistory.unt.edu/explore/collections/TR/

7.1.9 (iii) - Decision-making **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
Federal: GMFMC and NOAA Fisheries observe the same transparency requirements in decision-making regarding public meeting information, proposed regulation changes, reports and assessments, and other shrimp fishery publications as detailed in the assessment and management sections above. **Gulf States:** GSMFC also observers the same transparency requirements detailed in the assessment section above. Additionally, a recently developed website sponsored by GSMFC, Gulf FINFO, also contains information on the shrimp fisheries of the Gulf of Mexico, summarizing management practices, biological information, assessment and monitoring activities, and harvest and contains links to population assessments and other relevant documents.[1] **Texas:** TPWD and TPWC observe the same transparency requirements in decision-making regarding shrimp industry related activities as detailed in the assessment and management compliance sections above.		

[1] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=102

7.1.10 Are the conservation and management measures adopted for management of the fishery and the related decision-making process given due publicity in order to ensure that laws, regulations and other legal rules governing their implementation are effectively disseminated?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Aside from the actions listed above (see response to 7.1.9 regarding scoping and public comment periods, etc.), the GMFMC publishes scientific reports, management plans, amendments, meeting agendas, minutes, and transcripts on their website, ensuring regulatory information is effectively disseminated.[1,2] Prior to each meeting, briefing materials are also made available online, allowing stakeholders to become familiar with subjects of interest.[3] The GMFMC website also contains information regarding recent updates to Gulf fishery regulations, ensuring the public		

stays apprised of the latest legal rules governing the fishery.[4] GMFMC also communicates publicly via newsletters, social media posts, and cell phone applications, all in an effort to effectively disseminate conservation and management information.[5] NOAA Fisheries SERO posts updated links to published fishery bulletins seeking public comment on proposed fishery regulation changes.[6,7] Their website also contains a News Room link where the public may access recent media activity.[8] The NOAA Fisheries SEFSC website contains a publication database searchable by topic/species. Grants, research programs, technical reports, peer-reviewed publications, and initiatives may be searched through the publications database as well.[9] The SEFSC Library is also available to the public through the SEFSC website.[10] The SEFSC Galveston Laboratory website also publicizes recent press releases on their website and displays information and links regarding shrimp harvest forecasting reports and assessment information.[11,12] **Gulf States:** The GSMFC publishes reports and assessments as soon as possible once approved by the Commissioners. These reports are posted online in the publications area of the GSMFC website.[13] Notification of availability is sent to newspapers and local media as well as posted on GSMFC and state agency social media and web pages. Meeting minutes and records are compiled into a "draft minutes book" twice a year after both the Spring and Fall annual meetings and sent to the Commissioners and meeting participants within two to three months. All GSMFC meeting minutes are collated by year and published annually on the website.[14] Documents that are not immediately available on the website can be requested directly from GSMFC. GSMFC meetings are open to the public and allow for public comment periods. Meeting dates, locations and agendas can be found on the GSMFC website. **Texas:** Aside from the actions listed above (see responses to 7.1.9), TPWD takes several actions to ensure that adopted regulations are adequately publicized. The TPWD website posts all fishing regulations and maintains a series of social media accounts to provide updated information to specific user groups. Handbooks, such as the 2014-15 Texas Commercial Fishing Guide, are also available in print form and are distributed widely.[15,16,17]		

[1] "Meetings" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/index.php

[2] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[3] "Meetings" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/index.php

[4] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[5] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[6] "Fishery Bulletin Archives" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/bulletin_archives/index.html

[7] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[8] *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/index.html

[9] "Publications" *NOAA Fisheries Southeast Fisheries Sciences Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/publications/

[10] "Library" *NOAA Fisheries Southeast Fisheries Sciences Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/library/

[11] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[12] "Brown Shrimp Forecast 2015" *NOAA Fisheries Galveston Laboratory*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/stories/2015/Brown%20Shrimp%20Forecast/index.html

[13] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[14] "Meeting Minutes" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=MINUTES

[15] *"Fishing Rules and Regulations" Outdoor Annual, Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/

[16] "Social Media" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/socialmedia/

[17] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

7.2 Management objectives

7.2.1 (a) Are fisheries measures based on the best scientific evidence?

Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The state and federal agencies (GMFMC, NOAA Fisheries, TPWC and TPWD) charged with management of shrimp in Texas and the Gulf of Mexico are mandated by laws to manage the fishery based on best available scientific evidence. These agencies work closely on research and monitoring and timely scientific information is provided to managers during the decision-making process. For further details on scientific programs and management measures, **refer to 7.1.1(a).**		

7.2.1 (b) Are they qualified by relevant environmental and economic factors?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: MSA NS1 requires the consideration of social, economic, and ecological factors in the determination of OY for the fishery.[1] To the extent possible, relevant social, economic, and ecological factors used should be quantified and must be specified when determining OY. An FMP must address each factor: social, economic, and ecological within the report. Amendment 13 of the Shrimp FMP contains a discussion of environmental and socioeconomic impacts in Actions 6 and 7 with regard to the setting of MSY and OY for the penaeid shrimp species.[2] Amendment 15 of the Shrimp FMP includes revisions to the SDC for the fishery and contains updated information on environmental and socioeconomic impacts.[3] The National Environmental Policy Act (NEPA) requires the analysis of any potentially significant environmental impacts that may result from new regulations or agency actions by all federal government agencies.[4] Section 304(i) of MSA requires compliance with NEPA regulations with regard to fishery management plans and actions.[5] NOAA Fisheries determines the analysis level necessary to comply with MSA and NEPA regulations for each FMP amendment and management action.[6] A summary of findings is compiled in either a Record of Decision or a Finding of No Significant Impact (FONSI) which is included in each FMP or amendment. For the shrimp FMP, an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) has been conducted for each amendment, as necessary. The most recent EA is included with Amendment 13.[7] SEC. 303 (a)(9) of the MSA requires that FMPs include a fishery impact statement (FIS) for the plan or amendment.[8] The FIS includes an assessment of the likely biological, social, economic, and administrative effects, if any, of the conservation and management measures on fishery participants and their communities as well as participants in other fisheries conducted in adjacent areas. NOAA Fisheries also requires a Regulatory Impact Review (RIR) for each regulatory action of public interest, which provides a review of the level and incidence of impacts associated with the action, a review of the problems and policies prompting the action, and ensures that the agency has comprehensively considered all alternatives.[9] **Texas:** The 1989 Texas Shrimp FMP defines optimum yield as "the amount of shrimp the fishery will produce on a continuing basis to achieve the maximum economic benefits to the shrimping industry and the state, as modified by any relevant social or ecological factors."[10] Based on FAO guidelines, one typical method of addressing the broad economic context of a fishery is through consultation with legitimate users.[11] TPWD conducts scoping meetings and public hearings to gain socioeconomic		

information prior to finalizing new regulations and considers these factors in the decision-making process.[12,13] The Texas Administrative Procedures Act requires public participation in the TPWC and TPWD decision-making process and requires that a Local Employment Impact Statement be filed for proposed regulations, which requires an evaluation of local economic impact of the proposed rule.[14] Environmental factors are addressed within the Texas Shrimp FMP, which notes that TPWD is requires to research environmental parameters and other factors influencing shrimp abundance through PW Code 77.004, and recommends that TPWD continue to aggressively protect shrimp habitat and water quality.[15]		

[1] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[4] "National Environmental Policy Act" *NOAA Office of Planning and Integration*. Web. Accessed November 2015. http://www.nepa.noaa.gov/

[5] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[6] "National Environmental Policy Act Requirements" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/msa/nepa.html

[7] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[8] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[9] "Guidance for Conducting Economic and Social Analyses of Regulatory Actions. *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/economic_social/index.html

[10] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

[11] FAO, *A fishery manager's guidebook: Management measures and their application*. FAO Fisheries Technical Paper 424. (Rome, 2002). http://www.fao.org/docrep/015/i0053e/i0053e.pdf

[12] "Comment on Proposed Regulations and Transactions" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/business/feedback/public_comment/

[13] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

[14] Tex. Gov. Code § 2001.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.2001.htm

[15] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

7.2.1 (c) Have formal reference point(s) based on stock size been established?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance	
Yes	**No**
Amendment 13 (2005) of the GMFMC Shrimp FMP originally defined the reference points for the Gulf of Mexico shrimp fishery. At the time, amendment 13 noted the following: *In accordance with the National Standards guidelines set by MSA, for annual stocks, like penaeid shrimp, it is appropriate to establish an MSY control rule based on maintaining a constant level of escapement (parent stock) each year that will produce sufficient recruits to maintain harvest at historic levels. This approach relates MSY in terms of catch to a quantifiable level of escapement in each stock, where a proxy for B_{MSY} is established as the minimum parent stock size known to have produced MSY the following year.*[1] Based on these guidelines, Amendment 13 established the following: The MSY values for the penaeid shrimp stocks fall within the range of values defined by the lowest and highest landings taken annually from 1990-2000 that does not result in recruitment overfishing as defined herein: - Brown shrimp: MSY is between 67,000,000 and 104,000,000 lbs. of tails - White shrimp: MSY is between 35,000,000 and 71,000,000 lbs. of tails The overfishing threshold is defined as a rate of fishing that results in the parent stock number being reduced below the MSY minimum levels listed below: - Brown shrimp- 125 million individuals, age 7+ months during the November through February period - White shrimp- 330 million individuals, age 7+ months during the May through August period An overfished condition would result when a parent stock number falls below one-half of the overfishing definition listed below. - Brown shrimp - 63 million individuals, age 7+ months during the November through February period - White shrimp - 165 million individuals, age 7+ months during the May through August period Due to recent updates in stock assessment modeling, stock assessments for shrimp are now being conducted with a new model. This model provides different outputs than the original stock assessment models used when the SDC for shrimp stocks was set in Amendment 13. In 2015, the SDC for the shrimp fishery were redefined, through Amendment 15 of the GMFMC Shrimp FMP as the following:[2] **MSY:** - **Brown shrimp: 146,923,100 pounds of tails** - **White shrimp: 89,436,907 pounds of tails** **Overfishing:** - **Brown shrimp: F_{MSY} 9.12** - **White shrimp: F_{MSY} 3.48** **Overfished:** - **Brown shrimp: SSB_{MSY} is 6,098,824 pounds of tails** **White shrimp: SSB_{MSY} is 365,715,146 pounds of tails**	

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

7.2.2 Have management measures taken into account the need to avoid excess capacity and promote conditions under which the interests of fishermen, especially the small-scale, artisanal and subsistence fishery sectors, are protected, the biochemistry conserved, depleted stocks restored and adverse environmental impacts assessed and corrected?

(a)(i) - Is the level of excess capacity defined?[1] **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The Gulf of Mexico shrimp fishery conducted in federal waters is managed by GMFMC and NOAA Fisheries under a federal shrimp permit moratorium system. Capacity of the federal fleet was analyzed in 2006 by Kirkely et al. in a larger study examining overcapacity in several U.S. fisheries.[1] Since that time, the Gulf of Mexico shrimp fishery has seen significant reductions in license numbers due to economic losses of the fishery. The current license moratorium for the federal fleet will expire in 2016. GMFMC and NOAA Fisheries are currently working to assess the capacity of the fishery and determine the appropriate number of permits through Amendments 17A and 17B.[2,3] For additional details, refer to 7.1.8(a). **Texas:** Funk et al. (2003) utilized models to analyze the Bay and Bait License Reduction Program and calculated the excess capacity of the Bay shrimp fishery and determined that there were still 289 excess vessels in the fishery.[4] Considering that approximately 50% of licenses purchased in the buyback program, it was estimated that it would take about 15 years to reach the target goal. However, increases in import competition caused a drops in shrimp prices and, coupled with increases in fuel prices, the fishery has seen significant reductions and the combined Bay and Bait fisheries are now under 800 total licenses as of 2015.[5]		

[1] James E. Kirkley, John M. Ward, James Nance, Frank Patella, Karyl Brewster-Geisz, Chris Rogers, Eric Thunberg, John Walden, Will Daspit, Brad Stenberg, Steve Freese, Jim Hastie, Stephen Holiman, and, Mike Travis, 2006. *Reducing Capacity in U.S. Fisheries*. NOAA Technical Memorandum NMFS-F/SPO-76. http://spo.nmfs.noaa.gov/tm/tm76.pdf

[2] GMFMC. *Draft options for Amendment 17A of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-4PHDraftShrimp17A

[3] GMFMC. *Draft options for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-%205%20Shrimp%2017b-%20OY%20and%20Permit%20Pool.pdf

[4] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[5] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

7.2.2 (a)(ii) - Is excess capacity avoided? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The moratorium put in place by Amendment 13 capped the number of licenses in the fishery to the number of qualifying permits that were issued in the first year of the moratorium: 1,933 permits. Since 2007, permit numbers have decreased to 1470 permits in 2014 through termination of permits that were not renewed by the permit holder.[1] GMFMC and NOAA Fisheries are currently reassessing the appropriate number of permits for the fishery through the development of Shrimp FMP Amendment 17B. **Texas:** Funk et al. (2003) utilized models to analyze the Bay and Bait License Reduction Program and calculated the excess capacity of the Bay shrimp fishery and determined that there were still 289 excess vessels in the fishery.[2] Considering that approximately 50% of licenses purchased in the buyback program, it was estimated that it would take about 15 years to reach the target goal. However, increases in import competition caused a drops in shrimp prices and, coupled with increases in fuel prices, the fishery has seen significant reductions and the combined Bay and Bait fisheries are now under 800 total licenses as of 2015.[3]		

[1] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[2] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[3] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

7.2.2 (b) - Do the economic conditions under which the fishery operates promote responsible fisheries? **Y Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance
N/A
This question has been omitted from scoring.

7.2.2 (c) - Are interests of small-scale, etc., fishermen accounted for? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The original shrimp FMP implemented in 1981 contains a socioeconomic characterization of the fishery.[1] Section 3.5.5 addressed subsistence fishing and determined that there are no individuals, communities or societies were identified to meet the accepted definition; however, there may be some fishermen who partially subsist on shrimp. These fishermen typically fish under recreational permits.		

Section 3.5.6 addresses Native American rights to resources and traditional fishing practices and did not identify any persons or communities in Texas that would require consideration within the FMP.

MSA NS4 and NS8 require an evaluation of fishing participants and communities within the fishery and mandates equitable distribution of resources and consideration of community reliance on resources when setting regulations:[2]

NS4: Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (a) fair and equitable to all such fishermen; (b) reasonably calculated to promote conservation; and (c) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privilege.

NS8- Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.

Additionally, Executive Order 12898 directs federal agencies to identify and develop strategies to address the human health or environmental effects that agency actions may have a disproportionately high and adverse effect on minority and low-income populations.[3]

Amendment 13 of the Shrimp FMP section 7.3.2 contains information on the social environment of the shrimp fishery and identifies important communities within the Gulf of Mexico that rely on the shrimp fishery. Amendment 13 identifies 24 communities that are relatively vulnerable to social and economic impacts of management changes within the shrimp fishery and should be given additional consideration.[4]

Texas:

There is no strict definition of "small-scale" or "artisanal" based on FAO guidelines or documents; however, there is agreement that these terms reference specific aspects of a fishery, such as size and scale of the fishery, its proximity to shore and duration of trip, use of technology, and individual ownership as opposed to businesses or corporations.[5] Based on these guidelines, the many participants of the Texas inshore shrimp fishery conducted within state waters could be considered small-scale fishermen. Vessel sizes that are generally small in comparison to the larger, offshore fleets and fishers tend to work with few crewmembers, if any, to a boat. Trips are inshore and daily, not several days out at sea. The 2003 report on the Texas Inshore Bay and Bait license Buyback Program notes that the Bay fishery, which harvests shrimp for human consumption from inshore waters typically uses vessels between 15 to 60 feet, whereas the Gulf fleet typically utilized vessels from 60-90 feet.[6] TPWD considers all of these factors when setting regulations for the shrimp fishery and

consults with industry representatives through the workshops and public hearings to discuss these factors.[7,8,9,10,11] TPWD maintains separate licenses to address these various users with Bay and Bait licenses for inshore waters and Gulf licenses for offshore areas.[12] TPWD publicizes public hearings, scoping meetings, comment periods for proposed management actions through the TPWD website and encourages public participation through these outlets, and fishermen are actively engaged.[113,14]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] Executive Order 12898 http://www2.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

[4] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[5] Fisheries and Aquaculture topics. Small-scale and artisanal fisheries. Topics Fact Sheets. Text by Jan Johnson. In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 27 May 2005. [Cited 11 August 2014]. http://www.fao.org/fishery/topic/14753/en

[6] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[7] Art Morris, Personal Communication. Texas Parks and Wildlife Department. June 2014.

[8] TPWD. Letter to Shrimp License Holders. November 20, 2014.

[9] "Comment on Proposed Regulations and Transactions" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/business/feedback/public_comment/

[10] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[11] Tex. Gov. Code § 2001.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.2001.htm

[12] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[13] "Texas Register" The Portal to Texas History. Web. Accessed June 2015. http://texashistory.unt.edu/explore/collections/TR/

[14] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

7.2.2 (d) - Has the biodiversity of aquatic ecosystems been conserved (as a result of operation of the fishery in question)? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	There are two overarching considerations for the Texas shrimp fishery with regard to conservation of biodiversity of ecosystems: bycatch and bottom habitat impacts. **<u>Bycatch</u>:** Bycatch is a major concern in shrimp fisheries globally. A FAO report on fishery discards (Kelleher 2005) indicates that, world-wide, shrimp trawl fisheries have both the highest discard rate and volume of all fisheries.[1] This report also notes that warm-water shrimp trawl fisheries typically have significantly higher proportions of bycatch (average: 75% of total catch), than cold-water fisheries (average: 10% of total catch). Environmental impacts associated with bycatch include depletion of species typically caught as bycatch, which may include species that are listed as protected, endangered, or threatened (PET), and alterations of the food web such as trophic cascades. Managers and shrimp fishermen throughout the Gulf of Mexico have collaborated to develop and utilize best-practices for bycatch reduction and have made substantial progress in minimizing bycatch impacts. Collaboration is ongoing to develop innovative methods to further address bycatch concerns. NOAA Fisheries National Bycatch Report acknowledges the improvements made to the Gulf of Mexico shrimp fishery and also provides suggestions for additional improvement.[2] Trawling, in general, is not considered a selective form of fishing; however, the selectivity of trawls is dependent on a variety of factors including the type and size of trawls, modifications such as BRDs, geographic area fished, and regulations on how they are used. A recent report by the Sustainable Fisheries Partnership (SFP) on shrimp fisheries bycatch highlights the progress that the Gulf of Mexico shrimp fishery has made in recent years to substantially reduce bycatch including the required use of BRDS, TEDs, area closures, effort limitations, and gear restrictions such as configuration and size limits of trawls.[3] The SFP report notes that the Gulf of Mexico shrimp otter trawl fishery has received "low risk" scores for a majority of categories, with only a few "medium-risk' areas, and no "high-risk" ratings. The initial NOAA National Bycatch Report, published in 2011, indicated that the fishery bycatch ratio (ratio of the total fishery bycatch to total fishery catch) for the Gulf of Mexico shrimp fishery was .76, the highest of all U.S. fisheries analyzed in the report (note: some fisheries were data-deficient and could not be included, such as the South Atlantic shrimp trawl fishery).[4] The 2013 update to the National Bycatch Report indicates that improvements in bycatch estimation and bycatch reduction in the Gulf of Mexico shrimp trawl fishery have resulted in a decrease of the fishery bycatch ratio from .76 to .63.[5] This report shows continued progress in efforts to reduce impacts of bycatch in the fishery; however, the shrimp fishery does still remain one of the highest bycatch fisheries in the U.S. The fishery bycatch ratio for all U.S. fisheries combined is .17. The National Bycatch Report includes a Bycatch Estimation Improvement Plan for the Gulf of Mexico shrimp trawl fishery with recommendations for the fishery.	

Initial bycatch ratio estimates for the Gulf of Mexico shrimp fishery from 1970s were approximately 10:1, with some estimates based on season and area as high as 13.7:1.[6] Since that time, the implementation of turtle excluder devices (TEDs), bycatch reduction devices (BRDs) and significant reductions in shrimp effort have all contributed to considerable reduction in the bycatch of this fishery. Estimates in 2009 concluded that bycatch ratios had remained consistent at approximately 4:1 since 2000.[7] The 2012 report by Scott-Denton et al, utilizing observer data, determined that total bycatch to shrimp ratios had decreased further to to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[8] Currently, observer data are the only long-term data set documenting bycatch of the fishery and observer coverage is limited (1-2% coverage). The National Bycatch Report, published by NOAA, considers the observer coverage on the Gulf of Mexico shrimp fleet to be at a pilot/baseline stage and ranks the fishery as a Tier 2 (0=lowest, 4=most successful) for bycatch estimation, indicating that methods for obtaining data and estimating bycatch need improvements before being considered reliable.[9] Characterization of bycatch composition from Scott-Denton et al. (2012) for the federal offshore fleet shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*) are common.[10] The bycatch species identified are consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Many incidental catch species are utilized by fishermen and may be retained up to certain limits (varies by state), such as seabobs, rock shrimp, blue crabs, and some finfish species.

National Standard 9 of the MSA requires that "conservation and management measures shall, to the extent practicable: (1) minimize bycatch; and (2) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."[11]

The GMFMC shrimp FMP contains two goals/objectives that directly address this mandate of the MSA:[12]

- Objective 4: "Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act."
- Objective 5: "Minimize the incidental capture of finfish by shrimpers, when appropriate."

Amendment 13 of the shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[13] These methods include the implementation of an electronic logbook program (ELM) for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition. Amendment 13 also required annual completion of a Gulf Shrimp Vessel and Gear Characterization Form, requires reporting of landings, and placed a moratorium on the issuance of new permits in the fishery. Due to the high costs of outfitting boats with observers, NOAA Fisheries determined that 1% coverage would be adequate to document information on bycatch composition in the fishery and these data could be combined with detailed effort data from ELBs to extrapolate total bycatch numbers

for the fishery. Observer data goes into the SEDAR process and is utilized in models to determine bycatch of individual species, which is then used in assessments of those species. There are criticisms by some stakeholders that 1% is not an adequate amount of coverage and could lead to the "observer effect", where fishermen modify their behavior when observers are present; however, NOAA Fisheries analysts consider 1% to be sufficient.

ENDANGERED SPECIES:
One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the Endangered Species Act (ESA), which includes five species of sea turtles (Hawksbill, green, Kemp's Ridley, leatherback, and loggerhead), smalltooth sawfish, and Gulf sturgeon (a subspecies of Atlantic sturgeon).[14] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. NOAA Office of Protected Resources provides detailed information on each species on their website, with each species site containing details on species status, description, habitat, distribution, population trends, threats, regulatory history and conservation efforts.[15]

Sea Turtles:
Five species of sea turtles are known to inhabit areas that overlap with shrimp trawling activity in the Gulf of Mexico:

- Hawksbill (*Eretmochelys imbricate*)
- Kemp's ridley (*Lepidochelys kempii*)
- Leatherback(*Dermochelys coriacea*)
- Green (*Chelonia mydas*)
- Loggerhead (*Caretta caretta*)

Kemp's ridleys are of most concern among the five species due to their limited range, which is primarily within the Gulf of Mexico. The other four species of sea turtles are found worldwide.[16]

A National Research Council (NRC) report published in 1990 determined that shrimp trawl bycatch was one of the most significant sources of mortality causing declines in sea turtle populations.[17] Research on TEDs began in the late 1970s, and in 1981 a voluntary program was initiated to encourage fishermen to utilize TEDs in shrimp trawls. Early TED designs were cumbersome and difficult to use and did not gain favor with most fishermen; therefore, TED use was low throughout the 1980s.[18] Federal legislation was passed in 1987 and went into effect in 1989 requiring widespread use of TEDs in shrimp trawls and by 1990 most shrimp trawls were equipped with TEDs. In 1993 a modification was made to allow for increased escape of leatherback turtles and in 2003, and additional modification in regulations to require larger opening further increased escape rates for larger loggerheads and leatherbacks. The 2003 regulation change was expected to reduce mortality of loggerheads by 94% and leatherbacks by 97%. Certified TED designs are required to meet a minimum efficiency threshold of 97% escapement of turtles within a five minute time period. TEDs have been very effective at reducing sea turtle shrimp trawl mortality as summarized by Finkbeiner et al. (2011):[19]

Species	Mortality	
Atlantic/Gulf	Pre-regulation	Post-Regulation
Lepidochelys kempii	4,300	2,700
Caretta caretta	63,500	1,400
Chelonia mydas	500	300
Dermochelys coriacea	2,300	40
Eretmochelys imbricata	20	<10
	70,620	4,450

Post-TED mortality estimates are about 94% lower, (4,450 total deaths) than pre-regulation estimates (70,620). Mandatory TED requirements are currently in place for otter trawls in the shrimp fishery in both state and federal waters.

Mandatory TED requirements are currently in place for all otter trawls in the shrimp fishery in both state and federal waters (federal jurisdiction of protected species extends into state waters) and Texas fully complies with TED requirements and requires TEDs under state laws as well.[20]

NOAA and USFWS are jointly responsible for sea turtle conservation under the ESA and are required to consult on all activities that may impact the recovery of each species. Through this consultation process, NOAA has produced several Biological Opinions pertaining to sea turtle conservation and continued authorization of the Gulf of Mexico shrimp fishery. Each Biological Opinion produced by NOAA has authorized the continued operation of the shrimp fishery and includes an Incidental Take Statement. The 2012 Biological Opinion established requirements for enforcement and compliance with TED use in shrimp trawls and set a 'sea turtle capture rate standard' that limits the fishery to a 12 % sea turtle capture rate.[21] The 2014 Biological Opinion maintains this standard (88% effectiveness) in the Incidental Take Statement as a procedure for determining if impacts of the action (continued operation of the shrimp trawl fishery) exceed the expected authorized take.[22] If an Incidental Take Statement is exceeded, a new Biological Opinion is initiated. Compliance rates are actively monitored and a minimum 88% effectiveness rate with TED use must be maintained otherwise NOAA Fisheries is required to take action, which could include closure of the fishery.[23] NOAA Fisheries posts compliance data on their website and current data indicate that the Gulf of Mexico shrimp fleet (including Texas) is in compliance with TED requirements.[24]
Currently, TED compliance is enforced by NOAA Fisheries enforcement agents, USCG, and each of the five state agency enforcement officers. The effectiveness rate required by the Biological Opinion is calculated using NOAA enforcement and inspection rates. Violations are ranked from Level 1 through Level 4 based on severity of violation and likelihood that the offense would lead to a higher turtle capture rate.[25] These compliance data are entered into a matrix to determine the overall effectiveness rate of TEDs in the shrimp trawl fleet. NOAA enforcement and inspection data are currently the main sources of information on TED compliance used to determine effectiveness for the Gulf shrimp fleet. Though TED enforcement and inspections are conducted by the USCG and each state agency, these data are not

made public and not necessarily included in NOAA's calculations. Many stakeholders believe that measuring TED compliance using only enforcement data biases the calculation negatively because enforcement is not random, rather, enforcement agents tend to target vessels that are more likely to be out of compliance. This leads to higher reporting of offenses and a lack of documentation of vessels that are in compliance. In 2015, representatives from each of the enforcement agencies met to further discuss inconsistencies in inspection methods and concerns over methods used to determine TED compliance.[26] State and federal agencies continue to discuss possible solutions to these concerns. NOAA enforcement and inspection rates for the shrimp fishery are low due to a limited number of enforcement agents and few members of the NOAA Gear Monitoring Team (GMT) capable of conducting inspections. In 2015, the federal fishery has over 1300 permits and the number of state licenses range from 300-1000+ permits. NOAA inspections cover about 200 vessels per year.[27] Compliance rates are calculated by quarter, and small sample sizes in some months can lead to biases the overall compliance percentages. The inclusion of USCG and state agency enforcement data could improve the sample size and reduce bias in these calculations.

Compliance rates have fluctuated for the past several years and maintaining high TED compliance and effectiveness rates for the fishery requires ongoing efforts. A particular period of concern occurred from March to November 2011, when the TED compliance rate was as low as 66%, with an effectiveness rate ranging between 83-85%.[28] It should be noted that investigation into TED compliance during this time found that the majority of violations were from newly installed TEDs that were not properly installed by net shops. NOAA was able to trace the TEDs back to specific net shops to rectify the problem and the TEDs were corrected prior to the opening of shrimp season; therefore, while compliance rates appear low for this time period, the actual risk to sea turtle populations was avoided.[29] Since 2011, education, outreach, and increased courtesy inspections by NOAA GMT and Sea Grant have helped to increase compliance ratings and NOAA now posts compliance numbers quarterly on their website.[30] In 2015, overall effectiveness rates remained above 88% for every month, except April (85.15%) with an average overall effectiveness of 93.34%.

In addition to efforts to reduce sea turtle mortality from fishery interactions, NOAA Fisheries, USFWS, GSMFC, state agencies and shrimp industry groups have contributed to efforts to protect sea turtle nesting beaches in Mexico and areas throughout the Gulf coast to assist in the recovery of sea turtle populations.[31] Protection of nesting grounds has been a significant conservation action by eliminating direct harvest of turtle eggs and reducing nest predation. NOAA SEFSC Galveston Lab participates in a Captive Rearing Program.[32]

Smalltooth sawfish (*Pristis pectinata*)

The Recovery Plan for smalltooth sawfish cites bycatch in other fisheries as a primary reason for the decline of this species.[33] Previous documentation of landings as incidental catch in the shrimp fishery were reported between 1940s-1980s in Louisiana and Texas; however, there has been minimum documentation of recent

landings and informal interviews by port agents indicate that recent interactions are rare. The population of smalltooh sawfish is thought to have declined by as much as 95% and the geographical range of the species is likely significantly diminished. Currently, three National Wildlife Refuges in Florida provide habitat protection for known reproducing populations of smalltooth sawfish, catch or harm of smalltooth sawfish is illegal, and guidelines have been published on the handling and release of smalltooth sawfish that are incidentally caught in commercial and recreational fisheries. The recovery Plan estimates for 1 smalltooth sawfish taken in the shrimp trawl fishery per year. It is possible that the implementation of TEDs and BRDs in the shrimp fishery would allow for smalltooth sawfish escape should interactions with shrimp trawls occur. There is still some question; however, as to whether trawl bycatch might impact recovery if/when this species population begins to rebuild and potential interactions increase.

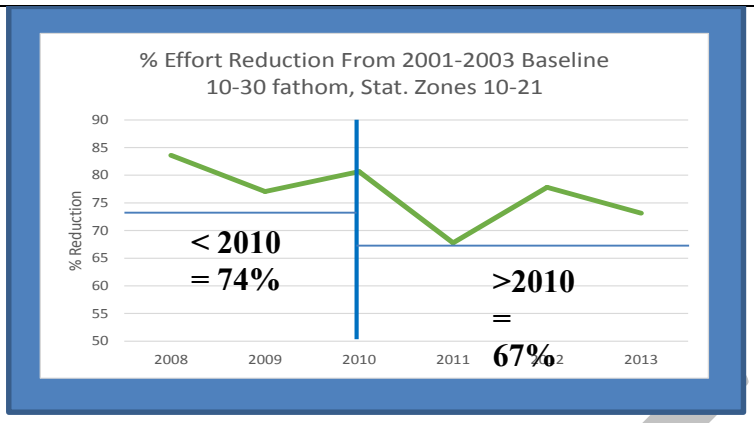
Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
The most recent 5-year review (2009) for the Recovery Plan for Gulf Sturgeon notes that bycatch in shrimp trawls has been infrequently documented in past and that implementation of TED and BRD regulations has likely mitigated bycatch impacts to this species.[34] No regulatory actions are required directly in relation to bycatch of Gulf sturgeon for the shrimp fishery.

Marine Mammals:
The Marine Mammal Protection Act (MMPA) 1994 revision includes changes of regulation regarding the incidental take of marine mammals in commercial fishing operations, requiring a goal to reduce serious injury and mortality of marine mammals to "insignificant levels", approaching a zero mortality rate.[35] "Insignificant Level" is defined as less than 10% of the potential biological removal (PBR). NOAA's Office of Protected Species evaluates fisheries based on their potential interaction with marine mammals during fishing operations and places fisheries into three categories: Cat. I- high interaction, Cat. II- med-low interaction, and Cat. III- little or no known interactions.[36] The Gulf of Mexico shrimp fishery is currently listed as a Category II fishery on the List of Fisheries.[37] This determination was based on potential interactions with bottlenose dolphins. Lack of a calculated PBR for the Gulf of Mexico bottlenose dolphin populations, data from stranding programs, and low observer coverage in the fishery are all reasoned that prompted NOAA to assign a Cat. II ranking. Cat. II designation requires that each fishery participant be registered with the Office of Protected species and carry an authorization certificate. Typically, registration with the Marine Mammal Authorization Program is combined with state and federal permitting systems and all fishermen receiving permits are registered with the Office of Protected Species automatically. Cat. II requirements also require the fishery to have an observer program and fishermen must carry an observer onboard if requested, and must comply with any take reduction plans in place. There is currently no take reduction plan in the Gulf of Mexico for bottlenose dolphins. Fishermen are also required to report all incidental injuries and mortalities of marine mammals to the Office of Protected Species.

Commercially and/or Recreationally Important Finfish Species Bycatch:
Red snapper (*Lutjanus campechanus*)

Red Snapper bycatch has been another major concern in the GOM shrimp fishery. The Red Snapper fishery in the Gulf of Mexico is considered overfished and is in a rebuilding plan.[38] This rebuilding plan included a significant reduction in juvenile red snapper bycatch in the GOM shrimp Fishery. Amendment 9 of the shrimp FMP deals directly with the reduction of red snapper bycatch.[39] The goal of Amendment 9 was to reduce bycatch of juvenile red snapper in age 0 and age 1 groups by 50%, which was the amount determined by NOAA Fisheries as necessary for the rebuilding plan. Amendment 9 required the use of Bycatch Reduction Devices (BRDs) in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ. East of Cape San Bal was exempt at the time due to low abundance of red snapper in this area, and state waters were not considered a factor because it was determined that juvenile red snapper typically occur beyond depths of 5 fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms).[40] BRD requirements included: 1) reduction of finfish/shrimp ration by 50%, 2) does not reduce shrimp catch by more than 3%, and 3) does not increase gear cost by more than 10%. BRD devices are certified by NOAA Fisheries and BRDs are required in all shrimp trawls except royal red trawls and try nets (nets smaller than 12 ft). The implementation of BRD regulations in 1998, and the requirement of TEDs, which also allow for the release of some finfish bycatch, along with the closure seasons/areas in place, and reduction in shrimp effort since the 1990s have all contributed to significant reductions in juvenile red snapper bycatch. The BRD certification criteria were changed by an August 2006 Regulatory Amendment to require that total finfish reduction be reduced by 30% with no specific red snapper requirement.[41] In 2007, Amendment 14 (effective in 2008) established a specific bycatch reduction target for the shrimp fishery and designated seasonal closure restrictions that could be used to manage shrimp fishing effort in relation to the target bycatch reduction goal.[42] The seasonal closure area were designated within the statistical zones 10-21 between 10-30 fathoms and designed to start in conjunction with the annual Texas Closure, if needed. The need for the closure, and its duration and extent is determined annually by an SEFSC assessment of the previous year's shrimp effort within the designated zone, and associated red snapper mortality. If it is determined that a seasonal closure is necessary, then the Regional Administrator will set the closed season area and duration as necessary to meet the bycatch reduction target.

Bycatch reduction target for juvenile red snapper in the shrimp fishery have been meet and exceeded through use of BRDs and significant reductions in shrimp effort (see chart below).[43]



Some stakeholders have also raised concern over other commercially and recreationally important species, such as blacknose shark (*Carcharhinus acronotus*). In 2007, NOAA Fisheries determined that blacknose shark was overfished and experiencing overfishing, and bycatch and associated mortality from the shrimp trawl fishery was considered a factor in the decline of the species.[44] Since this time, the blacknose shark population has been divided into two separate populations- an Atlantic population and a Gulf of Mexico population.[45] The Atlantic population remains listed as overfished and overfishing; however, the GOM stock is currently considered unknown based on the 2011 NOAA Fisheries stock assessment.[46] Raborn et al. (2012) determine that implementation of TEDs was effective in mitigating bycatch of blacknose sharks in the gulf of Mexico shrimp fishery since sharks are also capable of escaping trawls through TEDs.[47]

Other Common Bycatch Species Bycatch:

Amendment 9, requiring BRDs in shrimp trawls west of Cape San Blas, FL was implemented primarily with the intent of reducing juvenile red snapper; however, it also accomplished bycatch reduction of other common finfish species caught in trawls. Amendment 10 followed, requiring BRDs in shrimp trawls east of Cape San Blas to reduce finfish bycatch by 30% as required by the MSA bycatch reduction requirements.[48] There are no other strategies in place designed to specifically reduce other finfish in the Gulf of Mexico, and targets for reduction are based on finfish as a group. No other finfish in the Gulf of Mexico have been identified as being "at risk" due to bycatch in the shrimp fishery. Many of the typical species caught in shrimp trawls are highly productive, short-lived species with high resilience to fishing pressure.

Common species caught in shrimp trawls include:

- Atlantic croaker (*Micropogonias undulates)*
- Seatrouts (*Cynoscion sp.*)
- Longspine porgy (*Stenotomus caprinus*,)
- Inshore Lizardfish (*Synodus foetens*)

Based on a recent analysis by Raborn et al. (2014) these are the only finfish species and genus that represent 5% or higher in bycatch of shrimp trawls. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to any of these species.[49]

Texas:

BRDs are required in shrimp trawls in Texas waters as well as federal waters.[50] Bycatch studies on the Texas Bay Shrimp Spring and Fall seasons from 1993-95 indicated that bycatch to shrimp ratios were higher in the Fall than in Spring and varied among bay systems throughout the coast.[51] The highest ratio was 4.25:1 in Matagorda Bay in Fall and the lowest ratio was .36:1 in Laguna Madre in the Spring. Major bycatch species identified were gulf menhaden (*Brevoortia patronus*), Atlantic croaker (*Micropogonias undulatus*), bay anchovy (*Anchoa mitchilli*), spot (*Leiostomus xanthurus*), sand seatrout (*Cynoscion arenunus*), hardhead catfish (*Anus felis*), pinfish (*Lagodon rhomboides*), lesser blue crab (*Callinectes sirnilis*), blue crab (*Callinectes sapidus*), Atlantic brief squid (*Lolliguncula brevis*) and cabbagehead (or cannonball) jellyfish (*Stomolophus meleagris*). Retained incidental catch is documented through Trip Ticket Program if sold for commercial purposes.[52] The TPWD CFD conducts comprehensive fishery-independent surveys and its database is among the largest and longest-running program in the US.[53] These surveys are conducted monthly and are utilized to determine relative abundance, size, species composition, and temporal and spatial distribution of various life history stages of all fish and invertebrates in Texas coastal waters.[54] Trends in bycatch species are monitored through the fishery-independent sampling program.

In addition to enforcing federal TED regulations, TPWD implemented mandatory TED regulations in Texas state waters through 31 T.A.C. §58.160.[55]

Texas, in cooperation with NOAA Fisheries, also participates in turtle recovery programs for endangered Kemps Ridley turtles. A secondary nesting area (primary nesting is in Mexico) was developed on Padre Island, through a "head-start" program where turtles are raised and imprinted and released on Padre Island, where they return to nest in the Padre Island National Seashore. This area is protected by the National Park Service and each year volunteers are trained to patrol on monitor sea turtle nests on the island.[56]

Bottom Habitat Impacts:

Shrimp trawling can also cause damage to the sea floor by burying, exposing, or injuring marine organisms and submerged vegetation and may also impact ecosystem by resuspension of sediments and release of nutrients into the water column. The shrimp trawl fishery in the northern Gulf of Mexico primarily trawls with smaller nets 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. Chang et al. (2001) examined resuspension of sediments during hurricane events and determined that impacts occur to depths beyond 70 meters.[57] Typical shrimp trawling activities occur in shallower depths, generally above 30 meters. Dellapenna et al. (2006) determined that the turbidity plume following a shrimp trawl was comparable to the turbidity produced by a 9 to 10 m/s wind event at the study area in Galveston Bay, Texas.[58] The degree to which bottom trawls disturb sediment depends on the sediment type and the gear type, weight and speed. There are wide-ranging results from previous trawl impact studies possibly due to

differences in trawl methods, gear and/or habitat type; however, since trawl gear is designed to maintain contact with the seabed, some level of resuspension and sediment penetration is inevitable. An understanding of ecological effects is dependent on the site-specific characteristics such as bottom type, depth, community type, gear and methods used and the intensity of activity and other natural disturbances. Recovery of trawled substrate is also dependent on sediment type, depth, and natural influences. Few studies have focused on habitat recovery after trawl impacts and most existing studies have not addressed cumulative impacts of repeated trawling occurrences that would be typical of commercial fishing over time.[59] NRC (2002) reported that, based on rough estimates of the number of time a given area was swept, the Gulf of Mexico was one of the areas of highest intensity of effort.[60] NRC (2002) also notes that a significant reduction in effort has occurred in many areas due to area closures, seasonal closures and gear restrictions. A study by Jennings and Kaiser (1998) found it plausible that light shrimp trawls likely do not cause significant disturbance to shallow water communities in poorly sorted sediments. Additionally, they note that organisms in soft mud are capable of burrowing up to two meters deep and are likely not impacted by passing trawls.[61] Dellapenna et al. (2006) conducted studies on the impact of shrimp trawling in Galveston Bay, Texas and found that the maximum depth excavated by trawl gear was 1.5 cm.[62] Sanchez et al. (2000) similarly found that sporadic episodes of trawling in muddy habitats "may cause relatively few changes in community composition" and that "natural variability at some sites may exceed the effects of disturbance from fishing" and Ball et al. (2000) notes that epifauna are generally scarce in muddy sediment habitats.[63] Impacts on essential fish habitat (EFH) have been assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[64] The Initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico shrimp FMP (brown, white, pink, and royal red). Section 6.1 identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is reviewed and updated every five years.

The 2005 EFH Amendment 3 recommends the following management measures related to the shrimp fishery to minimize impacts:[65]

- prohibit use of trawl gear, bottom longlines, buoy gear and traps on coral reefs in the EEZ (includes East and West Flower Garden Banks, McGrail Bank, Pulley Ridge, North and South Tortugas Ecological Reserve, and coral communities in Stetson Bank)
- require a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf of Mexico EEZ.

These recommendations were adopted into regulation by NOAA Fisheries.[66] The EFH review in 2010 found that effort in all commercial fisheries had declines between 2000 and 2008, and that no new recommendations were necessary beyond the 2005 recommendations.

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7.2.2 (e) - Have depleted stocks been allowed to recover or, where appropriate, restored?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
The FAO defines 'depleted' as "a stock, driven by fishing, at very low level of abundance compared to historic levels, with dramatically reduced spawning biomass and reproductive capacity."[1] Based on the recent assessments of brown shrimp and white shrimp, neither population has experienced overfishing or an overfished status since NOAA Fisheries began monitoring the stocks and, therefore, has never been considered a depleted stock.[2,3] Amendment 13 of the GMFMC Shrimp FMP states "since shrimp are an annual crop, in that abundance in a given year is dependent on environmental factors rather than fishing effort, fluctuations in effort either up or down have not resulted in significant reductions in spawning stock biomass that could subsequently have caused recruitment overfishing."[4] In Amendment 13 (2005), the GMFMC established an overfishing level for each of the penaeid species in terms of a parent stock level, and defined an overfished condition as one half of the overfishing parent stock levels. Recently, NOAA Fisheries changed from a VPA model to a Stock Synthesis Model to improve the quality of stock assessments. The GMFMC SSC determined that the Stock Synthesis model was the best available science for determining the status of the Gulf shrimp stocks. New SDC were developed to align with model outputs. In 2015, Amendment 15 of the Shrimp FMP redefined the MSY, overfishing and overfished definitions for the shrimp fishery to the following:[5] MSY: - Brown shrimp: 146,923,100 pounds of tails - White shrimp: 89,436,907 pounds of tails		

Overfishing: - Brown shrimp: F_{MSY} 9.12 - White shrimp: F_{MSY} 3.48 Overfished: - Brown shrimp: SSB_{MSY} is 6,098,824 pounds of tails - White shrimp: SSB_{MSY} is 365,715,146 pounds of tails NOAA Fisheries has monitored stock levels for both shrimp species since 1970. Stock levels for both species have remained above the established thresholds throughout the monitoring period and neither stock is not considered overfished or undergoing overfishing.		

[1] "FAO Term Portal: Fisheries" *Food and Agricultural Organization of the United Nations*. Web. Accessed November 2015. http://www.fao.org/fi/glossary/

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[2] Hart, R.A. 2014. Stock Assessment Update for White Shrimp, *Litopenaeus setiferus*, in the U.S. Gulf of Mexico for 2014. SEFSC Galveston. 18pp. http://www.galvestonlab.sefsc.noaa.gov/publications/pdf/958.pdf

[3] Hart, R.A. 2014. Stock Assessment Update for Brown Shrimp, *Farfantepenaeus aztecus*, in the U.S. Gulf of Mexico for 2014. SEFSC Galveston. http://www.galvestonlab.sefsc.noaa.gov/publications/pdf/956.pdf

[4] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[5] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

7.2.2 (f) - Have adverse environmental impacts on the stocks from human activities been assessed and, where appropriate, **rectified**? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
.	Due to increases in coastal populations, high shipping traffic and the high activity of oil and gas industry in the Gulf region, environmental impacts from human activities are a constant concern and require regular assessment and rectification when necessary. There is a network of agencies and programs responsible for addressing the various human impacts on marine and coastal environments and natural resources in Texas and across the Gulf region, as listed below. While efforts by these agencies are ongoing and substantial restoration has taken place, many impacts are still being assessed and have not been fully rectified. Continuing efforts are needed to understand the impacts of disaster events, such as the 2010 Deepwater Horizon Oil Spill and the more recent Galveston oil spill in 2014, as well as the ongoing concerns of wetlands loss and pollution due to continued coastal population increases. State agencies: - Texas General Land Office (GLO): The GLO Oil Spill Prevention and Response Program is the lead agency for oil spills.[1] The GLO is also responsible for reducing nonpoint source pollution from sources such as forestry, agriculture, urban areas, marina, and shoreline modifications. Marine	

debris clean ups are organized through the GLO, as well as wetlands protection and restoration due to loss from urban development, channelization, pollution and sea level rise.

- Texas Commission on Environmental Quality (TCEQ): The TCEQ Emergency Response Program is the lead agency for release of hazardous substances.[2] TCEQ is also responsible for water usage (freshwater inflow), and water quality.
- TPWD Environmental Assessment, Response and Restoration Program (EARR) is the lead wildlife response agency that addresses impacts to fish and wildlife as a result of human impacts.[3] TPWD's Kills and Spills Team (KAST) and legal team work within this program to investigate fish and wildlife kills, pollution affecting fish and wildlife, and harmful algal blooms.[4,5]

Federal Agencies:

- USCG Marine Environmental Protection Program addresses concerns of invasive species, oil and chemical spills, and ocean dumping.[6]
- Environmental Protection Agency (EPA) Emergency Management Program ensures that facilities and organizations take steps to prevent oil spills, chemical accidents, and other emergencies, implement planning and preparedness requirements, and respond to environmental emergencies.[7]
- NOAA- Office of Response and Restoration provides comprehensive solutions to environmental hazards caused by oil, chemicals, and marine debris, and serves as the scientific support coordinator for the USCG during responses to spills.[8]
- USFWS- Environmental Contaminants Program emphasizes contingency planning and cooperation at the local, regional and national level in an effort to minimize the injury to fish, wildlife, and sensitive environments from oil spills.[9]

PROGRAMS:

- The Natural Resource Damage Assessment (NRDA) is a legal process that works to restore natural resources to pre-spill conditions after they have been impacted due to oil and chemical spills and to compensate the public for impacted resources and services.[10] NRDA is designed to carry out the objectives set forth in the Clean Water Act, the Oil Pollution Act, the Comprehensive Environmental Response Compensation and Liability Act, the Texas Water Code, and the Texas Oil Spill Prevention and Response Act.
- The Coastal Impact Assessment Program (CIAP) provides federal funding derived from offshore oil and gas lease money to oil-producing states for restoration projects for remediation of industry impacts.[11]
- State Methodology for Determination of Needs in the Major Estuaries of Texas is a program jointly established and maintained by Texas Water Development Board (TWDB), TPWD, and TCEQ to address ecological needs of freshwater inflows within management of water resources that are being impacted by growing demand for water resources to accommodate human uses.[12]

	- Aransas County and the Coastal Conservation Association (CCA) have also created a public-private partnership for the restoration of the Cedar Bayou pass that was closed off in 1979 during the Ixtoc I oil spill.[13] The reopening of a channel between Cedar Bayou and the Gulf of Mexico is designed to reestablish tidal flow within the bay and allow for juvenile migration of important species, including blue crab, back into the nursery areas that the bayou provides. The project was recently completed and the pass reopened in September of 2014. - Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) Act: The recovery and restoration in response to the 2010 Deepwater Horizon oil spill is still ongoing. In July of 2012 the RESTORE Act was signed into law to direct the majority (80%) of the civil penalties paid under the Federal Water Pollution Control Act as a result of the spill. RESTORE funds are dedicated to restoration efforts in each of the affected Gulf States.[14] TCEQ maintains a website specifically for the RESTORE efforts in Texas, which includes information on progress of restoration efforts, grant opportunities and long-terms plans.[15]	

[1] "Oil Spills" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/oil-spills/index.html

[2] "Emergency Response – Spills" *Texas Commission on Environmental Quality*. Web. Accessed June 2015. http://www.tceq.state.tx.us/response/spills.html

[3] "TPWD's Environmental Assessment, Response and Restoration (EARR) Program" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/environconcerns/damage_assessment/earrp.phtml

[4] "Kills and Spills Team" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/environconcerns/kills_and_spills/

[5] Cindy Contreras, *Thirty Years of Investigating Fish and Wildlife Kills and Pollution in Texas*. Resource Protection Division. Texas Parks and Wildlife Department. WRTS-2003-001, June 2003. http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_rp_v3400_1044.pdf

[6] "Marine Environmental Protection Program" *United States Coast Guard*. Web. Accessed June 2015. http://www.uscg.mil/top/missions/marineenvironmentalprotection.asp

[7] "Emergency Management" *Environmental Protection Agency*. Web. Accessed June 2015. http://www.epa.gov/emergencies/

[8] *NOAA Office of Response and Restoration*. Web. Accessed June 2015. http://response.restoration.noaa.gov/

[9] "Environmental Contaminants Program" *U.S. Fish & Wildlife Service*. Web. Accessed June 2015. http://www.fws.gov/contaminants/Issues/OilSpill.cfm

[10] "Natural Resource Damage Assessment FAQ" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/environconcerns/damage_assessment/faq.phtml

[11] "Coastal Impact Assistance Program" *U.S. Fish & Wildlife Service*. Web. Accessed June 2015. http://wsfrprograms.fws.gov/Subpages/GrantPrograms/CIAP/CIAP.htm

[12] Texas Water Department Board. "State Methodology for Determination of Needs in the Major Estuaries of Texas" Austin, TX March 2013. http://www.twdb.texas.gov/surfacewater/flows/freshwater/doc/State_Methodology.pdf

[13] *Cedar Bayou Restoration Project*. Web. Accessed October 2014. http://www.restorecedarbayou.org/about/

[14] *Restore the Gulf*. Web. Accessed June 2015. http://www.restorethegulf.gov/

[15] *RESTORE the Texas Coast*. Web. Accessed June 2015. http://restorethetexascoast.org/

7.2.2 (g)(i) - Have pollution and waste been minimized? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: U.S. fisheries are governed by U.S. Coast Guard regulations that aim to minimize environmental impacts including pollution and waste and comply with international MARPOL regulations.[1] **Texas:** Texas law also addresses waste and pollution through the Litter Abatement Act and the Water Code, which place restrictions on disposal of solid wastes and discharge of waste into Texas waters.[2] TCEQ is the environmental agency of the state responsible for protecting the state's public health and natural resources consistent with sustainable economic development.[3] The TCEQ creates and enforces regulations regarding clean air, clean water and safe management of waste.		

[1] "Environmental Standards Division" *United States Coast Guard*. Web. Accessed November 2015. https://homeport.uscg.mil/mycg/portal/ep/channelView.do?channelId=-18361&pageTypeId=13489

[2] "Texas Litter Abatement Act and Water Code" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/spdest/parkinfo/rules_and_regulations/

[3] "Pollution Prevention Programs" *Texas Commission on Environmental Quality (TCEQ).* Web. Accessed June 2015. http://www.tceq.state.tx.us/p2/pollution_prevention.html

7.2.2 (g)(ii) - Has catch by lost and abandoned gear of commercial species and other organisms been minimized? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Since gear remains attached to the vessel while actively fishing, typically damaged gear is recovered and repaired, if possible.		

The original Gulf of Mexico shrimp FMP (1981) notes that one of the problems identified in the fishery is "loss of gear and trawling grounds due to man-made underwater obstructions" and Goal 7 of the FMP is to "minimize adverse effects of underwater obstructions to shrimp trawling".[1] Measure 10 of the shrimp FMP adopted by the council is "The GMFMC will attempt to reduce, where feasible, the loss of offshore trawlable bottom by establishing within GMFMC a committee to monitor and review construction of offshore reefs, with attention to the needs of reef fish, and shrimp user groups." The Texas Sea Grant program developed guide books for shrimp vessels in the Gulf of Mexico documenting bottom obstructions and areas to avoid trawling due to potential interactions.[2,3] Most vessels have utilizes these book, and in more recent years, other technologies that help track sea floor obstacles that may interfere with trawl gear. Trawls are also required to have a weak link in the tickler chain that makes contact with the bottom, which is designed to break away to prevent gear from entanglement.[4]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Gary Graham, David Veal, and Bill Hosking. *"Hangs" and Bottom Obstructions of the Mississippi/Alabama Gulf*. TAMU-SG-83-505. Texas Sea Grant, 1983 http://texasseagrant.org/assets/uploads/publications/1983/83-505.pdf

[3] Gary Graham. *Bottom Fishing Obstructions: Texas/Louisiana Gulf*. TAMU-SG-76-502. Texas Sea Grant. 1975. http://texasseagrant.org/assets/uploads/publications/1976/76-502.pdf

[4] U.S. 50 CFR §622.9 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_19

7.2.2 (g)(iii) - Have selective and environmentally-safe and cost-effective fishing methods been developed? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	The primary gear type in the Texas commercial shrimp fishery are otter trawls. Beam trawls are also legal gear as try nets and may be utilized in some inshore areas as a primary net.[1,2,3] <u>Otter trawls</u>: The basic otter trawl is the most common gear type used in Texas waters.[4] Otter trawls were introduced in the shrimp fishery in 1917 and became the dominant gear type of the Gulf of Mexico shrimp fishery.	

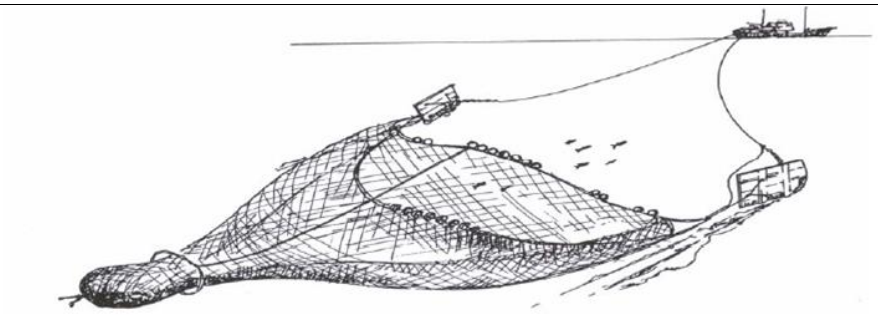

Figure 3 Otter Trawl

In the offshore fleet, several configurations of otter trawls have been developed and used over time. From 1917-1940s, the single rig (shown above) was the main style, and is still in use in inshore fisheries. In the 1950s as shrimping moved further offshore, the double rig was developed which utilizes two smaller nets instead of one large net, which increased efficiency and reduced handling problems. More recently, the twin trawl system has become popular, which utilizes four small trawls (one twin trawl on each side of the boat from the outriggers). Studies on twin trawl design show increased catch efficiency, leading to reduced trip time and higher quality, and reduced fuel consumption.[5]

Federal and state regulations require the use of TEDs in all otter trawls in the Texas shrimp fishery to reduce sea turtle capture.[6,7] Federal regulations requiring TEDs in all otter trawls for the shrimp fishery went into effect in 1989.[8] Additional Texas state regulations requiring TEDs went into effect in 2001.[9] TEDs are not 100% effective; certified TED designs are required to meet a 97% efficiency rate for turtle exclusion within a 5 minute period. Current certified TEDs in use; therefore, are effective in allowing the escape of most turtles caught within shrimp trawls. Turtle mortality has decreased significantly since the implementation of TEDs and most sea turtle populations show signs of rebuilding.[10] Maintaining compliance rates and TED effectiveness above the 88% threshold set by the 2014 Biological Opinion requires continuous efforts throughout the Gulf of Mexico shrimp fishery.

Federal regulations also require the use of BRDs in all shrimp trawls fishing in federal waters to reduce the incidental catch of various finfish species.[11] Amendment 9 first required the use of Bycatch Reduction Devices (BRDs) in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ for the purpose of reducing juvenile red snapper bycatch.[12] East of Cape San Bal was exempt at the time due to low abundance of red snapper in this area, and state waters were not considered a factor because it was determined that juvenile red snapper typically occur beyond depths of 5 fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms).[13] Amendment 10 followed, requiring BRDs in shrimp trawls east of Cape San Blas to reduce total finfish bycatch by 30% as required by the MSA bycatch reduction requirements.[14]

Many of the typical species caught in shrimp trawls are highly productive, short-lived species with high resilience to fishing pressure.
Common species caught in shrimp trawls include:

- Atlantic croaker (*Micropogonias undulates)*
- Seatrouts (*Cynoscion sp.*)
- Longspine porgy (*Stenotomus caprinus*,)
- Inshore lizardfish (*Synodus foetens*)

Based on a recent analysis by Raborn et al. (2014) these are the only finfish species and genus that represent 5% or higher in bycatch of shrimp trawls. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to any of these species.[15]

BRDs are also required in state waters in Texas.[16] Bycatch studies on the Texas Bay Shrimp Spring and Fall seasons from 1993-95 (prior to BRD regulations) indicated that bycatch to shrimp ratios were higher in the Fall than in Spring and varied among bay systems throughout the coast.[17] The highest ratio was 4.25:1 in Matagorda Bay in Fall and the lowest ratio was .36:1 in Laguna Madre in the Spring. Major bycatch species identified were gulf menhaden (*Brevoortia patronus*), Atlantic croaker (*Micropogonias undulatus*), bay anchovy (*Anchoa mitchilli*), spot (*Leiostomus xanthurus*), sand seatrout (*Cynoscion arenunus*), hardhead catfish (*Anus felis*), pinfish (*Lagodon rhomboides*), lesser blue crab (*Callinectes sirnilis*), blue crab (*Callinectes sapidus*), Atlantic brief squid (*Lolliguncula brevis*) and cabbagehead (or cannonball) jellyfish (*Stomolophus meleagris*). Retained incidental catch is documented through Trip Ticket Program if sold for commercial purposes.[18] The TPWD CFD conducts comprehensive fishery-independent surveys and its database is among the largest and longest-running program in the US.[19] These surveys are conducted monthly and are utilized to determine relative abundance, size, species composition, and temporal and spatial distribution of various life history stages of all fish and invertebrates in Texas coastal waters.[20] Trends in bycatch species are monitored through the fishery-independent sampling program.

Gear development:

The SEFSC Pascagoula Lab contains the Harvesting Systems Unit, which is a team of gear specialists and fishery biologists performing research into critical problems relating to commercial and recreational fishing gear to inform and improve fisheries resource management.[21] The Harvest Systems Unit is responsible for the development, evaluation, certification, and national and international technology transfer of turtle excluder devices (TEDs) for trawling gear. The Harvesting Systems Unit is also responsible for the development and assessment of bycatch reduction devices (BRDs) to reduce finfish bycatch in shrimp trawls. Research on TEDs and BRDs for the shrimp fishery is ongoing with annual testing on new designs of these devices to improve efficiency in reducing bycatch and minimizing shrimp loss and studies are conducted both independently, and in collaboration with commercial shrimpers through cooperative research projects. There are currently several certified designs of both TEDs and BRDs approved by the NOAA.[22,23] Members of the Harvesting Systems Unit also conduct courtesy inspections of TEDs and BRDs installed on shrimp boats during dock visits, workshops and upon request to ensure that these devices are properly used.

Bottom habitat impacts:

Shrimp trawling can also cause damage to the sea floor by burying, exposing, or

injuring marine organisms and submerged vegetation and may also impact ecosystem by resuspension of sediments and release of nutrients into the water column. The shrimp trawl fishery in the northern Gulf of Mexico primarily trawls with smaller nets 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. Chang et al. (2001) examined resuspension of sediments during hurricane events and determined that impacts occur to depths beyond 70 meters.[24] Typical shrimp trawling activities occur in shallower depths, generally above 30 meters. Dellapenna et al. (2006) determined that the turbidity plume following a shrimp trawl was comparable to the turbidity produced by a 9 to 10 m/s wind event at the study area in Galveston Bay, Texas.[25] The degree to which bottom trawls disturb sediment depends on the sediment type and the gear type, weight and speed. There are wide-ranging results from previous trawl impact studies possibly due to differences in trawl methods, gear and/or habitat type; however, since trawl gear is designed to maintain contact with the seabed, some level of resuspension and sediment penetration is inevitable. An understanding of ecological effects is dependent on the site-specific characteristics such as bottom type, depth, community type, gear and methods used and the intensity of activity and other natural disturbances. Recovery of trawled substrate is also dependent on sediment type, depth, and natural influences. Few studies have focused on habitat recovery after trawl impacts and most existing studies have not addressed cumulative impacts of repeated trawling occurrences that would be typical of commercial fishing over time.[26] NRC (2002) reported that, based on rough estimates of the number of time a given area was swept, the Gulf of Mexico was one of the areas of highest intensity of effort.[27] NRC (2002) also notes that a significant reduction in effort has occurred in many areas due to area closures, seasonal closures and gear restrictions. A study by Jennings and Kaiser (1998) found it plausible that light shrimp trawls likely do not cause significant disturbance to shallow water communities in poorly sorted sediments. Additionally, they note that organisms in soft mud are capable of burrowing up to two meters deep and are likely not impacted by passing trawls.[28] Dellapenna et al. (2006) conducted studies on the impact of shrimp trawling in Galveston Bay, Texas and found that the maximum depth excavated by trawl gear was 1.5 cm.[29] Sanchez et al. (2000) similarly found that sporadic episodes of trawling in muddy habitats "may cause relatively few changes in community composition" and that "natural variability at some sites may exceed the effects of disturbance from fishing" and Ball et al. (2000) notes that epifauna are generally scarce in muddy sediment habitats.[30] Impacts on essential fish habitat (EFH) have been assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[31] The Initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico shrimp FMP (brown, white, pink, and royal red). Section 6.1 identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is reviewed and updated every five years.

The 2005 EFH Amendment 3 recommends the following management measures related to the shrimp fishery to minimize impacts:[32]

1. Prohibit use of trawl gear, bottom longlines, buoy gear and traps on coral reefs in

	the EEZ (includes East and West Flower Garden Banks, McGrail Bank, Pulley Ridge, North and South Tortugas Ecological Reserve, and coral communities in Stetson Bank) 2. Require a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf of Mexico EEZ. These recommendations were adopted into regulation by NOAA Fisheries.[33] The EFH review in 2010 found that effort in all commercial fisheries had declines between 2000 and 2008, and that no new recommendations were necessary beyond the 2005 recommendations.	

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] 31 T.A.C. §58.160 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

[3] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[4] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

[5] Twin Trawl design study http://www.crimond.com/twintrawlreport.htm

[6] 50 CFR § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[7] 31 T.A.C. §58.160 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

[8] "History of Turtle Excluder Devices (TEDs)" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/history.htm

[9] TPWD, *The Texas Shrimp Fishery*. Report to the Texas Governor and the 77th Legislature. 2002. https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_v3400_857.pdf

[10] Elena M. Finkbeiner, Bryan P. Wallace, Jeffrey E. Moore, Rebecca L. Lewison, Larry B. Crowder, and Andrew J. Read, "Cumulative estimates of sea turtle bycatch and mortality in USA fisheries between 1990 and 2007" Biological Conservation 144 (2011) 2719–2727 http://micheli.stanford.edu/pdf/Cumulative%20estimates%20of%20sea%20turtle%20bycatch%20and%20mortality%20in%20U.S.A.%20fisheries%20between%201990-2007.pdf

[11] 50 CFR §622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[12] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[13] Nichols, Scott. *The spatial and temporal distribution of the bycatch of red snapper by the shrimp fishery in the offshore waters of the US Gulf of Mexico*. Pascagoula, Mississippi: National Marine Fisheries Service, Mississippi Laboratories, 1990.

[14] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2002. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[15] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[16] 31 Tex. Admin. Code §58.160 https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

[17] Billy Fuls, Tom Wagner and Lawrence McEachron. *Characterization of Commercial Shrimp Trawl Bycatch in Texas During Spring and Fall Commercial Bay-Shrimp Seasons: 1993-1995.* (Texas Parks and Wildlife, Coastal Fisheries Division, MDS 180, 2002). https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS180.pdf

[18] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[19] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[20] Jan Culbertson, Lance Robinson, Page Campbell, and Linda Butler, *Trends in Texas Commercial Fishery Landings, 1981-2001*. (TPWD MDS No. 224, 2004) https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS224.pdf

[21] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[22] "TED Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/designs.htm

[23] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[24] G. C. Chang, T. D. Dickey, and A. J. Williams III. "Sediment Resuspension over a continental shelf during Hurricanes Edward and Hortense." *Journal of Geophysical Research, Vol. 106, No. C5*. May 2001 http://onlinelibrary.wiley.com/doi/10.1029/2000JC900032/pdf

[25] Dellapenna et al., 2006 as cited in GMFMC. *5-Year Review of the Final Generic Amendment Number 3 Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the Fishery Management Plans of the Gulf of Mexico*. October 2010. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/EFH%205-Year%20Review%20Final%2010-10.pdf

[26] Michael C. Barnette. *A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat*. NOAA Technical Memorandum NMFS-SEFSC-449. February 2001 http://www.safmc.net/managed-areas/pdf/Barnettegear.pdf

[27] National Research Council. *Effects of Trawling and Dredging on Seafloor Habitat*. Washington, DC: The National Academies Press, 2002. doi:10.17226/10323 http://www.arrancoast.com/science/effects_of_trawling_and_dredging_on_seafloor_habitat.pdf

[28] Simon Jennings and Michel Kaiser. "The Effects of Fishing on Marine Ecosystems" *Advances in Marine Biology*. January 1998. http://www.researchgate.net/profile/Michel_Kaiser/publication/222490649_The_Effects_of_Fishing_on_Marine_Ecosystems/links/0fcfd50af7a1a0577a000000.pdf

[29] Dellapenna et al., 2006

[30] Sanchez et al., 2001 and Ball et al., 2001 as cited in Barnette, 2001 http://www.safmc.net/managed-areas/pdf/Barnettegear.pdf)

[31] "Essential Fish Habitat Amendments" *Gulf of Mexico Fishery Management Council*. Web. Accessed November. 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

[32] GMFMC. *Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 2005. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL3_EFH_Amendment.pdf

[33] 50 CFR § 622.15 (coral protection) and § 622.9 (prohibited gear) http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

7.2.3 Have the impacts of environmental factors on target species and those species associated with, dependent on, or belonging dependent on the target stocks, been assessed?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Environmental influences are a significant factor in the population dynamics of the three penaied shrimp species (brown, white and pink) managed under the federal shrimp FMP. The original shrimp FMP implemented in 1981 states "each year's take of brown, white, and pink shrimp will be heavily influenced by water salinity and temperature during critical periods of estuarine shrimp growth", and found that the critical determinant of shrimp production is estuarine environmental conditions.[1] Griffen et al. (1976) attempted to determine yield as a function of discharge from the Mississippi River, which highly impacts salinity and temperature of primary estuarine habitats in the northern Gulf of Mexico.[2] Tropical storms and heavy rainfall are also noted as significant environmental factors effecting shrimp populations. The SEFSC Galveston Lab recently conducted a study on temperature and salinity effects on growth and survival of white and shrimp in relation to freshwater inflow and potential implications of river diversions.[3] Environmental impacts in relation to target and non-target species are addressed in the Environmental Assessments (EAs) and Environmental Impact Statements (EISs) prepared for each FMP and amendments.[4] The original shrimp FMP contains predator and prey information for each penaeid shrimp species. The Essential Fish Habitat (EFH) Generic Amendment (applied to all Gulf of Mexico FMPs) and accompanying EIS also contain detailed information on the shrimp		

fishery habitat needs, environmental factors, prey dependence, biological and environmental impacts of fishing methods.[5,6] During the larval stage, shrimp feed on phytoplankton and zooplankton. Postlarval shrimp migrate into estuaries where they become bottom feeders and typically feed on epiphytes, detritus, and algae. Juveniles and adults become more predatory and often prey on polychaetes, amphipods, nemotods, and chironomid larvae, but also continue to feed on detritus and algae. Penaeid shrimp shrimps are preyed upon by a wide variety of finfish species. Primary predators include black drum, redfish, speckled trout, southern flounder, Atlantic croaker, bass and several species of catfish. Many of these species are also common bycatch in the shrimp fishery. These species are monitored through independent sampling programs including annual SEAMAP surveys and resource surveys conducted by the NOAA SEFSC Pascagoula Lab.[7,8] **Texas:** TPWD CFD monitors the effects of environmental factors on target species and associated species through their fishery-independent sampling program. The fishery-independent sampling aims to assess the entire fish community and utilizes different gear types to collect data of various species and stages of life cycle within different habitats. A habitat characterization is done with each assessment type.[1] Salinity, water temperature, dissolved oxygen and turbidity are also recorded for each sample.[2] TPWD ERP is responsible for research on coastal issues including freshwater inflow, and habitat protection including wetlands and seagrasses.[3] TPWD also coordinate with other agencies on environmental monitoring. The State Methodology for Determination of Needs in the Major Estuaries of Texas is a program jointly established and maintained by TWBD, TPWD, and TCEQ.[4] The program is responsible for data collection and study determining the needs for freshwater inflows to the state's bays and estuaries to ensure maintenance and productivity of economically important and ecologically characteristic sport or commercial fish and shellfish, and the maintenance of estuarine life upon which such fish and shellfish are dependent.		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Griffen et al. as cited in GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://gulfcouncil.org/docs/amendments/SHRIMP%20FMP%20Final%201981-11.pdf

[3] "Fishery Ecology" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_ecology/currentresearch/caernarvon/index.html

[4] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[5] GMFMC. *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp*

Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral. 1998. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINALEFH-%20Amendment%201-%20no%20appendices.pdf

[6] GMFMC. Final Environmental Impact Statement *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 2004. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20EFH%20EIS.pdf

[7] "Southeast Area Monitoring and Assessment Program(SEAMAP)" *NOAA Fisheries*. Web. Accessed November 2015.http://sero.nmfs.noaa.gov/operations_management_information_services/state_federal_liaison_branch/seamap/index.html

[8] "Surveys" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[9] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[10] Steve VanderKooy (ed). GDAR01 Gulf of Mexico Blue Crab Stock Assessment Report (Gulf States Marine Fisheries Commission. Ocean Springs, MS. GSMFC Number 215, 2013) http://www.gsmfc.org/publications/GSMFC%20Number%20215.pdf

[11] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[12] Texas Water Department Board. "State Methodology for Determination of Needs in the Major Estuaries of Texas" Austin, TX March 2013. http://www.twdb.texas.gov/surfacewater/flows/freshwater/doc/State_Methodology.pdf

7.3 Management framework and procedures

7.3.1 (a) Have the management measures developed taken into account the whole stock unit over its entire area of stock distribution? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The federal Shrimp FMP implemented in 1981 determined the stock unit for the three penaeid shrimp species (brown, white and pink) to be the area of U.S. waters of the Gulf of Mexico bounded on the east side by a natural biological break in fauna on the southeast coast of Florida, and bounded on the west side by the political boundary with Mexico.[1] Detailed information on shrimp stocks and harvest in Mexican waters has not been available at the time of assessments by NOAA Fisheries; therefore, the assumption is made that shrimp moving across international boundaries between the U.S. and Mexico flows equally in both directions, and stocks are assessed and managed only for U.S. waters.[2] While NOAA Fisheries only regulates the fishery within federal waters, the GMFMC contains representatives from each of the five Gulf states, and the federal		

shrimp FMP developed by the GMFMC considers all state management measures when determining goals and actions for the federal FMP. Objective 3 of the FMP is to "coordinate the development of shrimp management measures by the GMFMC with the shrimp management programs of the several states, where feasible." Several actions have been taken since the initial implementation of the FMP to coordinate federal and state measures including adjustment, implementation, and repeal of certain minimum size regulations to create consistency across management areas, and implementation of area and seasonal closures coordinated between state and federal waters. Texas participates in the GMFMC process and manages the shrimp fishery in state waters consistent with the GMFMC shrimp FMP and federal regulations.		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] James Nance. Stock Assessment *Report 2008 Gulf of Mexico Shrimp Fishery*. NMFS SEFSC Galveston Lab. October 2008. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/BB%202009-10/D%20-%204%20Stock%20Assessment%20Report%20GOM%20Shrimp%20Fishery.pdf

7.3.1 (b) Have previously-agreed management measures established and applied in the same region been considered? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
<u>Federal</u>: The GMFMC considers a set of alternatives for each management action when determining measures for the Gulf of Mexico shrimp fishery.[1] Each FMP and amendment contains the full set of alternatives for each action with a discussion of the options and a rationale for the preferred alternative that is selected. Alternatives are developed using a wide range of sources, including management measures that have been established and applied in the region by state management agencies as well as measures applied in the South Atlantic shrimp fishery. Some examples include: - A cooperative closure with the state of Texas has been established. Federal EEZ waters adjacent to Texas are closed annually in conjunction with Texas state territorial waters to protect small brown shrimp migrating from estuaries out into the Gulf.[2] - A minimum size requirement for white shrimp landed in Louisiana. Since Louisiana maintains a minimum size limit for white shrimp in state waters, federal regulations also require that white shrimp caught in the EEZ must meet the minimum size limits set in Louisiana if landed in Louisiana ports.[3] **<u>Texas:</u>** TPWD has considered all management measures that are utilized by the GMFMC and NOAA Fisheries and by the state agencies in the other Gulf States and has implemented several regulations based coordination with these organizations.		

TPWD participates in the GMFMC process and manages the shrimp fishery consistent with the federal shrimp FMP.		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[3] 50 CFR § 622.56
http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

7.3.1 (c) Have all removals and the biological unity and other biological characteristics of the stock been considered? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**

Federal:

As noted in the draft Amendment 15 to the GMFMC shrimp FMP- "The biological characteristics that affect sustainable yields for penaeid shrimp are unusual. They are an annual crop."[1]

Few individuals survive beyond one year and harvest is primarily on the 0-year class. No stock-recruitment relationship has been determined for the three penaeid shrimp species (brown, white, pink) in the Gulf, and recruitment overfishing is considered not to be possible given economic and technological capabilities of the fishery. "Because of these characteristics, MSY is essentially all the shrimp available to harvest, using current technology." Abundance greatly varies on an annual basis dependent on temperature and salinity condition in estuaries.

In determining MSY for the three penaeid shrimp species in the initial shrimp FMP, a Schaefer model was used to determine MSY based on commercial estimates, then modified to consider environmental factors.[2] Estimates of recreational and bait fishery harvest, and discards are also added to establish a maximum probable catch for each species.

	Maximum Commercial Yield based on Schaefer model and environmental influences	Recreational	Bait	Discard	Total
Brown shrimp	117 million pounds of tails	8	2	5	132
White Shrimp	52 million pounds of tails	8	1	3	64
Pink shrimp	19 million pounds of tails	0	1	0	20
All 3 species combined					216

[1] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[2] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

7.3.1 (d) Has the best scientific evidence available been used to determine, inter alia, the area of distribution of the resource? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The MSA NS2 requires that the best available science be used when establishing conservation and management measures.[1] The GMFMC ensures this through rigorous review of the science and data used to inform management decisions by SSC. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[2] The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf States.[3] The SEFSC Galveston Lab shrimp fishery research program continues to research and maintain the best available science for use in stock assessments and management of the Gulf of Mexico shrimp fishery.[4] Stock assessments and other scientific reports by the Galveston Lab are reviewed by the GMFMC SSC and Special Shrimp SSC to confirm that they meet the requirement of best available science. The original shrimp FMP developed by the Gulf council contains detailed information on the stocks, areas of distribution, and biological characteristics of the species under management within the plan. The FMP contains the following information for brown, white and pink shrimp:[5] - Brown shrimp- range from along the north Atlantic and Gulf of Mexico Coast from Martha's Vineyard, Massachusetts, to the northwestern coast of the Yucatan. The range is not continuous but is marked by an apparent absence of brown shrimp along Florida's west coast between the Sanibel and the Apalachicola shrimping grounds. (Perez Farante, 1969). Highest catches in the Gulf of Mexico are found along the Texas, Louisiana, and Mississippi coasts. Mark-recapture studies have been conducted on brown shrimp populations in the Gulf and indicate mixing of populations along the north central and northwestern Gulf coast. (Gunter, 1962) - White shrimp- range along the Atlantic coast from Fire Island, New York, to Saint Lucie inlet, Florida, and along the Gulf coast from the mouth of the Ochlachonee River, Florida to Campeche. There are two centers of abundance in the Gulf: one along the Louisiana coast and one in the Campeche area (Perez Farante, 1969).		

- Pink shrimp- range along the Atlantic from the lower Chesapeake Bay south to around the Florida Keys and up and around the Gulf coast to Isla Mujeres, Mexico. Major concentrations are found off southwest Florida and in the southeast part of Golfo de Campeche. Additionally, the Essential Fish Habitat (EFH) Amendment includes detailed descriptions of all habitats in the Gulf of Mexico utilized by each shrimp species throughout its life cycle, and defines EFH for each species.[6]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] 50 CFR §600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[3] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[6] "Essential Fish Habitat Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

7.3.1 (f) Has the area through which the species migrates during its life cycle been considered?
Yes... [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The life cycles of the penaeid shrimp species found in the Gulf of Mexico are complex and include migration through several different environments. Detailed information on the biology and life cycle of brown and white shrimp is contained in the GMFMC shrimp FMP.[1] Adults typically spawn in the Gulf of Mexico, where fertile eggs hatch into free-swimming larvae. Larval shrimp go through several molts during this free-swimming pelagic stage. During the postlarval stage, shrimp enter estuarine environments and become bottom feeders. Within estuaries, juvenile shrimp typically feed within the marshwater or mangrove-water interface or submerged grass beds where there are high concentrations of food supply (detritus, algae, microfauna) and greater protection from predators. The wetland zone is an important component of shrimp habitat because the salinity regimes critical to shrimp growth occur in these areas. As shrimp grow larger (typically between 2.75-4.7 inches), they move to deeper waters and emigrate out into the Gulf of Mexico. This emigration is influenced by tide, temperature, and size. Adult white and brown shrimp prefer soft mud or peat bottoms that contain large amounts of vegetation or decaying matter. Brown shrimp are typically found in mud, sand or shell bottoms		

and some juvenile brown shrimp may be found in sand or clay bottom. White shrimp prefer muddy or silty bottoms, and are sometimes found in sand or clay bottom that contain fragments of shell. Pink shrimp prefer mud or silt bottoms with coral sand and mixed mollusk shell, or firm sand. White shrimp predominantly occur in depths shallower than 20 fathoms, brown shrimp are typically found at depths greater than 20 fathoms, and pink shrimp are typically found between 20-35 fathoms. The shrimp FMP recommends that that the Gulf States each consider sanctuary areas within state waters to protect sensitive shrimp nursery habitats. Texas has designated nursery areas for shrimp, including tributary bays, bayous, inlets, lakes and rivers, where shrimping is prohibited.[2] Additionally, the Essential Fish Habitat (EFH) Amendment includes detailed descriptions of all habitats in the Gulf of Mexico utilized by each shrimp species throughout its life cycle, and defines EFH for each species.[3]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[3] "Essential Fish Habitat Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

7.3.2 In the case of a transboundary, straddling and highly migratory fish stock or high seas fish stock throughout its range, are the conservation and management measures established for such stock within the jurisdiction of the relevant States, or the appropriate subregional, regional fisheries management organizations and arrangements, compatible? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
Federal: NOAA Fisheries and the GMFMC are responsible for management measures within the federal EEZ waters of the Gulf of Mexico and each individual state is responsible for management of the fishery within each state's territorial waters (FL and TX: out to nine nautical miles; LA, MS, AL: out to three nautical miles). The federal shrimp FMP implemented in 1981 determined the stock unit for the three penaeid shrimp species (brown, white and pink) to be the area of U.S. waters of the Gulf of Mexico bounded on the east side by a natural biological break in fauna on the southeast coast of Florida, and bounded on the west side by the political boundary with Mexico.[1] Detailed information on shrimp stocks and harvest in Mexican waters has not been available at the time of assessments by NOAA Fisheries; therefore, the assumption is made that shrimp moving across international boundaries between the U.S. and Mexico flows equally in both directions, and stocks are assessed and managed only for U.S. waters.[2]		

While NOAA Fisheries only regulates the fishery within federal waters, the GMFMC contains representatives from each of the five Gulf states, and the federal shrimp FMP developed by the GMFMC considers all state management measures when determining goals and actions for the federal FMP. Objective 3 of the FMP is to "coordinate the development of shrimp management measures by the GMFMC with the shrimp management programs of the several states, where feasible." Several actions have been taken since the initial implementation of the FMP to coordinate federal and state measures including adjustment, implementation, and repeal of certain minimum size regulations to create consistency across management areas, and implementation of area and seasonal closures coordinated between state and federal waters. **Texas:** Texas participates in the GMFMC process and manages the shrimp fishery in state waters consistent with the GMFMC shrimp FMP and federal regulations. Texas regulations include closure areas, closed seasons, and gear restrictions. **Other Gulf States:** All other Gulf States similarly participate in GMFMC and regulations across all U.S. Gulf States are compatible with federal regulations. **Interanational:** While no formal organization exists between the U.S. and Mexico on fisheries management, there is collaboration between the two countries and regulations in place in Mexico are compatible with U.S. regulations. Fishery management measures in Mexico for the shrimp fishery include the use of TEDs, closure areas, gear restrictions, and effort controls designed to maintain a minimum spawning biomass to ensure long term stability and use of the resource. [3]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] James Nance. Stock Assessment *Report 2008 Gulf of Mexico Shrimp Fishery*. NMFS SEFSC Galveston Lab. October 2008. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/BB%202009-10/D%20-%204%20Stock%20Assessment%20Report%20GOM%20Shrimp%20Fishery.pdf

[3] FAO, Global Study of Shrimp Fisheries, Fisheries Technical Paper No. 475. 2008. ftp://ftp.fao.org/docrep/fao/011/i0300e/i0300e02b.pdf

7.3.3 Have long-term management objectives been translated into a plan or other management document (subscribed to by all interested parties)?

- Is there a plan? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
Federal: The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the		

U.S. The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management. The MSA requires that all species managed by the Councils be included in a FMP. The GMFMC manages the three penaeid shrimp species (brown, white, and pink) and royal red shrimp under the Gulf of Mexico shrimp FMP. The shrimp FMP was initially implemented in 1981and has been amended several times as new information and scientific evidence has led to changes in management measures.[1]

The goals and objectives of the shrimp FMP are:

- Optimize the yield from shrimp recruited to the fishery
- Encourage habitat protection measures to prevent undue loss of shrimp habitat
- Coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible.
- Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act
- Minimize the incidental capture of finfish by shrimpers, when appropriate
- Minimize conflicts between shrimp and stone crab fishermen
- Minimize adverse effects of underwater obstructions to shrimp trawling
- Provide for statistical reporting system

All five states participate in the GMFMC process and contributed to the development and amendments of the FMP. Each state maintains representatives on the GMFMC, the Shrimp SSC, and the shrimp Advisory Panel (AP). The FMP addresses compatibility between state and federal agencies in joint management of the shrimp fishery. Several measures in the initial FMP adopted by the GMFMC pertain to collaboration between states and/or state and federal management, including:

- Measure 1: establishment of a cooperative closure with Florida and federal agencies to protect small pink shrimp until the reach legal size.
- Measure 2: establishment of a cooperative closure of Texas territorial waters with Federal EEZ waters adjacent to Texas for the protection of small brown shrimp.
- Measure 5: The Gulf States are encouraged to adopt flexible management procedures which would provide regulation by administrative agencies of the shrimp resources in inland waters and territorial seas.
- Measure 6: The Gulf States are encouraged to adopt reciprocal internal management decisions flexible enough to allow joint management of shrimp with other states and federal agencies.

TPWD participates in the GMFMC process, and manages the shrimp fishery in state waters consistent with federal regulations and recommendations.

Texas: The primary goal of the 1989 Texas Shrimp FMP is "to provide a management strategy for the shrimp fishery in Texas" and requires the TPW Commission to consider the following:[2] - Measures to prevent overfishing while achieving, on a continuing basis, the optimum yield for the fishery - Measures based on the best scientific information available - Measures to manage shrimp throughout their range - Measures, where practicable, that will promote efficiency in utilizing shrimp resources, except that economic allocation may not be the sole purpose of the measures - Measure, where practicable, that will minimize cost and avoid unnecessary duplication in their administration - Measures which will enhance enforcement This FMP defines optimum yield as "the amount of shrimp the fishery will produce on a continuing basis to achieve the maximum economic benefit to the shrimping industry and the State, as modified by any relevant social or ecological factors". The 17 recommendations were provided in the FMP, which served as the basis for regulations developed in subsequent years to ensure the sustainability of the shrimp fishery. Since 1989, the Texas Shrimp FMP has not been updated to include regulatory changes and changes in the industry.		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

(7.3.3 cont.)

- Is it subscribed to? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The Shrimp FMP and amendments form the basis for the regulations that are promulgated through the Code of Federal Regulations (CFR) by NOAA Fisheries. Title 50 of the CFR, Part 622, Subpart C contains the regulations for the shrimp fishery of the Gulf of Mexico. These regulations reflect the recommendations made through the GMFMC process. Regulations promulgated through the CFR are required by law for all participants fishing in the U.S. EEZ and are enforced by NOAA Fisheries Law Enforcement and the U.S. Coast Guard (USCG) Living Marine Resources division. Regulations made by GMFMC and NOAA Fisheries are respected by the individual states and state regulations for territorial waters are consistent with federal regulations.[4]		

Each of the five Gulf States has a Joint Enforcement Agreement (JEA) with NOAA Fisheries through the Cooperative Enforcement Program which allows U.S. state conservation law enforcement officers to enforce federal laws and regulations pertaining to marine resources and endangered species.[5] **Texas:** The recommendations provided in the 1989 Texas Shrimp FMP have led to numerous regulatory changes in Texas and shrimp regulations promulgated by TPWD are found in the Tex. Parks and Wild. Code § 77 and 31 T.A.C. §58.160.[6,7] Regulations are actively enforced by TPWD law enforcement agents.		

[1] 50 C.F.R. § 622
http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015.
http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015).
http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015.
http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

[6] Tex. Parks and Wild. Code § 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

[7] 31 T.A.C. §58.160
http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

7.3.4 Have attempts been made to foster cooperation in all matters related to:
(i) - information gathering and exchange? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce.[1] In addition, there are four nonvoting members representing the U.S. Coast Guard, U.S. Fish and Wildlife Service, Department of State, and the Gulf States Marine Fisheries Commission. GMFMC meets five times a year at various locations around the Gulf coast. Information is gathered from the five state agencies and NOAA Fisheries and information exchange occurs through regular meetings of the Council and committees and advisory panels. All information gathered by GMFMC is available through briefing books, reports and other GMFMC documents in the Resource Library posted online.[2]		

Through the management of NOAA Fisheries SEFSC and Galveston Laboratory, the Gulf Shrimp System, established in 1960, is a thorough, consistent data collection system which has provided the NOAA Fisheries Galveston Laboratory scientists with statistical information needed to conduct assessments of the commercial shrimp fishery (refer to 7.1.4(a) for details on GSS).[3] NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states.[4] NOAA Fisheries data are also gathered through the Galveston Lab Observer Program and the ELB program (refer to 7.1.7(a) for details on these programs).[5] GSMFC coordinates with the five Gulf states through several programs to foster cooperation and gather and exchange information. The Fisheries Economic Data Program collects economic data on recreational and commercial fisheries to monitor economic performance and assess economic impacts across all five Gulf States.[6] The Fisheries Information Network (FIN) was developed in 1999 out of a recognized need for coordinated and comprehensive data collection throughout the region for both commercial and recreational fisheries. FIN is divided into two sections, ComFIN for commercial fisheries and RecFIN for recreational fisheries. FIN is a state-federal cooperative program combining the efforts of all five Gulf State marine resource agencies, the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service, the National Park Service, GMFMC and GSMFC. Its purpose is the collection, management and dissemination of statistical data and information on fisheries throughout the region.[7,8] Trip Ticket Programs in each of the five Gulf States are coordinated through the FIN program. The Southeast Area Monitoring and Assessment Program (SEAMAP) was developed for the collection, management and dissemination of fishery-independent data throughout the region and is a partnership between state and federal agencies and university programs. Each year SEAMAP publishes environmental and biological atlases of Gulf of Mexico.[9,10] At the state level, TPWD Coastal Fisheries Division personnel regularly work with state agencies and research institutes (University of Houston- Clear Lake, Texas A & M University, Texas Sea Grant, Texas Commission on Environmental Quality (TCEQ), Texas General Land Office, Texas Water Development Board) as well as federal agencies (NMFS, U.S. Fish and Wildlife Service, and the U.S. Geological Survey). This work typically includes specific data collecting practices. TPWD representatives also attend GMFMC and GSMFC meetings and assist in the data collection efforts detailed above.		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[3] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[4] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[7] "Fisheries Information Network (FIN)" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/fin.php

[8] FIN. *2014 Operations Plan for the Fisheries Information Network in the Southeastern United States*. GSMFC Number 218. June 2013. http://www.gsmfc.org/publications/GSMFC%20Number%20218.pdf

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] SEAMAP Subcommittee. *Annual Report to the Technical Coordinating Committee Gulf States Marine Fisheries Commission. October 1, 2012 to September 30, 2013*. GSMFC No. 221. October 2013. http://www.gsmfc.org/publications/GSMFC%20Number%20221.pdf

7.3.4 (ii) - fisheries research? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Fisheries research for the Gulf of Mexico shrimp stocks is mainly conducted by NOAA Fisheries, with additional research on inshore waters by individual state agencies. This research is shared through the GMFMC and GSMFC processes.[1,2] Through the management of NOAA Fisheries SEFSC and Galveston Laboratory, the Gulf Shrimp System, established in 1960, is a thorough, consistent data collection system which has provided the NOAA Fisheries Galveston Laboratory scientists with statistical information needed to conduct assessments of the commercial shrimp fishery (refer to 7.1.4(a) for details on GSS).[3] NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states. Information gathered from this survey helps determine economic trends of the industry and helps understand the social and economic impacts regulation changes may have on the fishery and communities.[4] NOAA Fisheries data are also gathered through the Galveston Lab Observer Program and the ELB program (refer to 7.1.7(a) for details on these programs).[5] The GMFMC maintains a Scientific and Statistical Committees (SSC) to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for		

fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[6] In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf state agencies. Further collaboration on fisheries research occurs through the GSMFC. GSMFC coordinates with the five Gulf states through several programs to foster cooperation in research. The Fisheries Economic Data Program collects economic data on recreational and commercial fisheries to monitor economic performance and assess economic impacts across all five Gulf States.[7] The Interjurisdictional Fisheries (IJF) Program coordinates management efforts between the five states through the development of regional FMPs for fisheries not covered by a GMFMC FMP.[8] SEAMAP was developed for the collection, management and dissemination of fishery-independent data throughout the region and is a partnership between state and federal agencies and university programs.[9] At the state level, TPWD Coastal Fisheries Division personnel regularly work with state agencies and research institutes (University of Houston- Clear Lake, Texas A & M University, Texas Sea Grant, Texas Commission on Environmental Quality (TCEQ), Texas General Land Office, Texas Water Development Board) as well as federal agencies (NMFS, U.S. Fish and Wildlife Service, and the U.S. Geological Survey). This work typically includes specific data collecting practices. TPWD representatives also attend GMFMC and GSMFC meetings and assist in the data collection efforts detailed above.		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[3] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[4] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[7] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[8] "Interjurisdictional Fisheries Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/ijf.php

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

7.3.4 (iii) - fisheries management? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
GMFMC promotes cooperation in management between the five states and federal agencies. The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce.[1] In addition, there are four nonvoting members representing the U.S. Coast Guard, U.S. Fish and Wildlife Service, Department of State, and the Gulf States Marine Fisheries Commission. GMFMC meets five times a year at various locations around the Gulf coast. GMFMC also maintains a specific Shrimp Management Committee including management representatives from the state agencies, NOAA Fisheries, and GSMFC; a Shrimp Advisory Panel composed of shrimp industry representatives from across the Gulf and a Shrimp SSC made up on biologists from each of the state agencies.[2,3] These processes ensure continued communication and collaboration between state and federal agencies and industry participants on fishery management for the Gulf shrimp fishery. Furthermore, the GMFMC shrimp FMP goals and objectives include "3) coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible."[3] Measures considered and adopted in the original FMP to carry out this goal include: Measure 1: establishment of a cooperative closure with Florida and federal agencies to protect small pink shrimp until the reach legal size. - Measure 2: establishment of a cooperative closure of Texas territorial waters with Federal EEZ waters adjacent to Texas for the protection of small brown shrimp. - Measure 5: The Gulf states are encouraged to adopt flexible management procedures which would provide regulation by administrative agencies of the shrimp resources in inland waters and territorial seas. - Measure 6: The Gulf states are encouraged to adopt reciprocal internal management decisions flexible enough to allow joint management of shrimp with other states and federal agencies. Additionally, GSMFC coordinates with the five Gulf states through several programs to foster cooperation in fisheries management. (For information on GSMFC Programs including the Fisheries Economic Data Program, IJF, and SEAMAP, see responses to 7.3.4 (i) and (ii)).		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[3] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

7.3.4 (iv) - fisheries development? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
FAO definition of development "continued progress towards desirable results, rather than growth".[1] The five Gulf states and NOAA Fisheries continue to collaborate on fisheries development through GMFMC.[2] Through the development of regional assessments and the shrimp FMP, new research is continually shared, additional research and management recommendations are indentified, and implementation is encouraged. Some recent developments include improved technology and data collection through the cellular ELB program, continued improvements and certification of new bycatch reduction devices through the Harvesting Systems Unit.[3,4] Additionally, collaboration through GSMFC has lead to the development and implementation of the Trip Ticket Programs allowing for uniform data collection and reporting throughout the five Gulf states, and enhanced seafood marketing through the Gulf States Marketing Coalition initiative.[5,6]		

[1] "FAO Term Portal- Fisheries" *United Nations Food and Agricultural Organization*. Web. Accessed November 2015. http://www.fao.org/fi/glossary/

[2] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[3] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[4] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[5] "Fisheries Information Network (FIN)" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/fin.php

[6] "Oil Disaster Recovery Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/odrp.php

7.4 Data gathering and management advice

7.4.2 Has relevant research been carried out on:

- the resource? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries is responsible for assessing and managing Gulf shrimp fisheries. NOAA SEFSC is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[1] SEFSC		

maintains labs in Galveston, TX, Lafayette, LA, Panama City, FL, Pascagoula, MS and Stennis, MS. SEFSC Research and Data programs are responsible for biological, economic and socio-cultural research and data collection for commercial and recreational fisheries, economics and fisheries-independent data. SEFSC conducts stock assessments for all species managed by GMFMC; stock assessments for shrimp are conducted annually through the Galveston Lab Shrimp Fishery Research Program.[2] To perform these stock assessments, NOAA Fisheries utilizes data from port agents, state trip ticket programs, electronic logbook data and observer programs.

The SEFSC collects fishery-dependent data for the shrimp fishery through the GSS. The GSS utilizes port agents throughout the Gulf of Mexico to collect landings data (amount and value) from seafood dealers, and interview data (fishing effort and location) from fishermen (refer to 7.1.4(a) for details on the GSS).[3] Additionally, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data.[4] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program (refer to 7.1.7 (a) for further details on ELB and observer programs). NOAA Fishery-Independent resource surveys are conducted through the SEFSC Mississippi Labs. Shrimp/Bottomfish surveys are conducted each Fall and Summer, which are designed to provide a time-series for monitoring trends in resource abundance.[5]

Gulf States:
GSMFC also plays a role in the Gulf shrimp fishery's assessment process. GSMFC organizes state supplied data to create regional reports. Once approved by their Commission, GSMFC publishes reports in the publications area of their website.[6] GSMFC assessment programs specific to the shrimp industry include the Southeast Area Monitoring and Assessment Program (SEAMAP) Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[7,8]
SEAMAP Gulf of Mexico Resource Surveys assess the shrimp fishery through the Summer and Fall Shrimp/Groundfish Surveys. Objectives include (but are not limited to):[9]

- Monitoring panaeid shrimp size and distribution
- Evaluating the "Texas Closure" portion of GMFMC's FMP
- Providing data on shrimp and groundfish stocks
- Obtaining measurements to determine population size structures

The Fisheries Economic Data Program published peer-reviewed economic reports in 2014.[10,11] These reports assessed the economic landscape of the shrimp industry, providing revenue, operating cost, annual expenditure, employment, and harvesting/harvester data.

Texas:
The TPWD CFD databases for fishery-dependent and fishery-independent information are among the largest and longest running programs in the U.S. and the

department also conducts special studies as the need arises.[12] The fishery-independent monitoring program has conducted gill net sampling since 1975, bag seine sampling since 1978, bay trawl sampling since 1982 and gulf trawl sampling since 1985. These surveys are conducted monthly (except gill net sampling, which is seasonal in spring and fall) and are utilized to determine relative abundance, size, species composition, and temporal and spatial distribution of various life history stages of fish and invertebrates in Texas coastal waters. Monitoring of landings and value of commercial marine species began in Texas in 1936 through a mandatory self-reporting system by seafood dealers. Prior to 2007, TPWD collected fishery-dependent data through the Marine Aquatic Products Report (MAPR) system, which required monthly reporting of the body of water, weight and price paid for each commercial species purchased by a seafood dealer each month.[13] In 2006, TPWD enhanced the fishery-dependent data collection by instituting the Program requiring all dealers of aquatic products to report statistical harvest data on a trip basis.[14,15] The Trip Ticket Program is equivalent to the reporting systems used nationally for collection of commercial landings data and requires the following standard information: trip date, trip number, vessel ID #, participant ID #, species, quantity landed, landing condition, market size range, ex-vessel value, location landed, dealer ID, transaction date, gear used, area fished.[16]		

[1] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] 2010 Analysis of Gulf Shrimp Moratorium Permits, NOAA.

[5] "Surveys" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[6] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[7] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[8] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] Miller, Alexander, Maryam Tabarestani, and Jack Isaacs. 2014. *A Survey of Recreational Shrimpers in the Northern U.S. Gulf of Mexico*. Gulf States Marine Fisheries Commission Publication, Publication Number 228. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20228.pdf

[11] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[12] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005.
http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[13] Jan Culbertson, Lance Robinson, Page Campbell, and Linda Butler, *Trends in Texas Commercial Fishery Landings, 1981-2001*. (TPWD MDS No. 224, 2004)
https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS224.pdf

[15] 5 Tex. Admin. Code § 66.019 http://codes.lp.findlaw.com/txstatutes/PW/5/B/66/A/66.019

[16] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[17] David Donaldson, *Overview of State Trip Ticket Programs in Gulf of Mexico* (SEDAR7-DW-20, 2004)
http://sedarweb.org/docs/wpapers/SEDAR7_DW20.pdf

(7.4.2 cont.)

- climatic and environmental factors? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries conducts research on climate change and fisheries.[1,2] In March 2015, NOAA Fisheries released a draft Climate Science Strategy (NCSS) for public comment. This strategy is designed to collect and provide information on changing climate and ocean conditions to better prepare for and respond to climate-related impacts.[3] The NCSS includes the following objectives: - Objective 1: Identify appropriate, climate-informed reference points for managing living marine resources (LMRs). - Objective 2: Identify robust strategies for managing LMRs under changing climate conditions. - Objective 3: Design adaptive decision processes that can incorporate and respond to changing climate conditions. - Objective 4: Identify future states of marine and coastal ecosystems, LMRs, and LMR-dependent human communities in a changing climate. - Objective 5: Identify the mechanisms of climate impacts on LMRs, ecosystems, and LMR-dependent human communities. - Objective 6: Track trends in ecosystems, LMRs and LMR-dependent human communities and provide early warning of change. - Objective 7: Build and maintain the science infrastructure needed to fulfill NOAA Fisheries mandates with changing climate conditions. For each of the objectives listed, there are specific actions identified to help achieve that objective within the strategy. The NCSS also includes a set of priority recommendations.		

NOAA conducts monitoring, research, modeling and assessment activities to inform fisheries management and protected resources in a changing environment. The Fish Stock Climate Vulnerability Assessment is currently being used to identify which stock may be most vulnerable to climate change, identifying areas where more data are needed, and providing a basis for actions that can be taken to reduce impacts.[4]

NOAA Fisheries Climate website provides a series of tools currently available regarding climate resilience including OCEANADAPT, which is a web-based tool developed through a partnership between NOAA Fisheries and Rutgers University that provides information about the distribution of commercially and recreationally important marine species over time.[5,6]

The SEFSC recently published the Ecosystem Status Report for the Gulf of Mexico in December 2013. This report includes information on climate drivers and physical pressures on the GOM ecosystem as well as fishing indicators.[7]

Texas:

According to the 1898 Texas Shrimp FMP, TPWD is required by Chapter 77 of the Texas Parks and Wildlife Code to conduct continuous research and study of environmental parameters that affect finfish, oyster and shrimp. TPWD is also required to study industrial and other pollution of water naturally visited by finfish/shellfish.[8] Current monitoring through the fishery-independent sampling program included collection of data on environmental parameters and studies are conducted to determine if trends in population abundance and stability, movement, growth, mortality, and impacts of environmental factors."[9] TPWD CFD contains a Water Resources Division (WRD) and an Ecosystem Resources Program (ERP) that address environmental factors such as water quality and habitat that affect the fishery.[10,11] In addition to these programs and the habitat assessments undertaken by the Coastal Fisheries department, TPWD also has a Kills and Spills Team (KAST) that works in conjunction with state and federal agencies to investigate fish and wildlife kills, pollution affecting fish and wildlife, and harmful algal blooms.[12]

[1] "Climate, Fisheries, and Protected Resources" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/stories/2014/03/climate_portal.html

[2] NOAA Fisheries. *Fish Stock Climate Vulnerability Assessment*. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/Fish_Stock_Climate_Vulnerability_Assessment.pdf

[3] NOAA Fisheries. *Draft Climate Science Strategy*. January 2015. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/draft_NOAA%20Fisheries_Climate_Science%20Strategy_Jan_2015.pdf

[4] "Assessing the Vulnerability of Fish Stocks in a Changing Climate" *NOAA Fisheries*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/activities/assessing-vulnerability-of-fish-stocks

[5] "Climate Tools" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/tools/index

[6] *Ocean Adapt*. Web. Accessed November 2015. http://oceanadapt.rutgers.edu/

[7] Mandy Karnauskas, Michael J. Schirripa, Christopher R. Kelble, Geoffrey S. Cook and J. Kevin Craig. Ecosystem Status Report for the Gulf of Mexico. NOAA Technical Memorandum NMFS-SEFSC-653. December 2013. http://gulfcouncil.org/docs/Gulf%20of%20Mexico%20Ecosystem%20Status%20Report.pdf

[8] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

[9] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[10] "Water Quality" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/

[11] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[12] Cindy Contreras, *Thirty Years of Investigating Fish and Wildlife Kills and Pollution in Texas*. Resource Protection Division. Texas Parks and Wildlife Department. WRTS-2003-001, June 2003. http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_rp_v3400_1044.pdf

(7.4.2 cont.)

- the socio-economic context? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[1] Each year a third of the permit holders are randomly selected for this survey and information is used to assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. NOAA Southeast Fisheries Science Center also contains a Social Science Research Group (SSRG) that conducts applied research on socio-cultural aspects of marine resources in the Gulf of Mexico.[2] This research largely focuses on participant and community dependence and engagement in fisheries and is directed by the principles of the MSA National Standard 8:[3] - *Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.* In 2005, NOAA conducted a series of studies to identify communities associated		

with the fishing industry and produced a report of the significant fishing communities in Texas.[4] The GMFMC shrimp FMP contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a Regulatory Impact Review.[5] **Gulf States:** GSMFC Fisheries Economic Data Program has conducted similar analyses to the SEFSC Annual Economic Survey for the inshore (non-federally-permitted) fleet in 2008 and 2012.[6,7,8] Additionally, GSMFC has produced reports on the economic baseline and characterization of dockside seafood dealers, and seafood processors for the U.S. Gulf of Mexico.[9,10] **Texas:** TPWD conducts scoping meetings, direct stakeholder communications, public hearings, public comment opportunities and advisory committee meetings to address socioeconomic aspects for potential regulation changes.[11,12] When setting new regulations for the fishery, TPWD is required by the Administrative Procedures Act to evaluate local economic impact prior to adoption of any proposal.[13] Economic impact evaluations are included in the proposed rule listing in the *Texas Register* during the open comment period.[14] For example, TPWD held scoping meetings fir shrimp industry stakeholders in December 2014 throughout the coast to discuss potential regulation changes for the fishery. Letters were sent to all current license holders in the shrimp fishery to notify them of the meetings.[15] In April of 2015, TPWD held a meeting for the public to comment on proposed regulation change regarding count/size requirements of commercial shrimping in inside waters, which was a recommendation by industry members during the December 2014 scoping.[16] The 2002 TPWD report to the Governor and 77th Legislature on the Texas shrimp fishery contains a socio-economic characterization of the fishery.[17]		

[1] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[2] "Social Science Research Group" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] Assessment, Impact. Inc., *Identifying communities associated with the fishing industry in Texas*. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-03-SE-0603. St. Petersburg, FL, 2005. http://www.st.nmfs.noaa.gov/humandimensions/publications/community-profiles-pub/index

[5] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[6] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[7] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[8] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[9] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[10] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[11] Art Morris, Personal communication. Texas Parks and Wildlife Department. June 2014.

[12] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005.
http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[13] Tex. Gov. Code § 2001.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.2001.htm

[14] "Texas Register" *The Portal to Texas History*. Web. Accessed June 2015.
http://texashistory.unt.edu/explore/collections/TR/

[15] TPWD Letter to Shrimp License Holders. November 20, 2014.

[16] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015.
https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

[17] TPWD, *The Texas Shrimp Fishery*. Report to the Texas Governor and the 77th Legislature. 2002.
https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_v3400_857.pdf

7.4.3 Has research been carried out on:

(i) - cost-benefits of fishing? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
N/A		
	Omitted from scoring at this time.	

7.4.3 (ii) - alternative management strategies? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: Alternative management strategies are explicitly and transparently considered throughout the management process through GMFMC. Each FMP contains a		

series of alternatives for each management measure, a rationale for the measure adopted and a list of which alternatives were considered but not adopted.[1] Additionally, all GMFMC meetings, including meetings of the Shrimp Management Committee, Shrimp SSC, Shrimp Advisory Panel, contain discussions of alternative management strategies, which are documented in meeting minutes and are open to the public.[2] **Texas:** TPWD has considered the management regulations utilized by different states throughout the GOM. Management options are discussed between state agencies through the GMFMC council, committee, and advisory panel meetings, which TPD representatives participate in. Within Texas, alternative management options are discussed at various levels: during scoping meetings with industry members, within internal TPWD departmental meetings and during TPWC meetings. PowerPoint presentations and meeting notes from industry scoping meetings document discussions. Meeting minutes from TPWC are available on the TPWD website.[3]		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[3] "TPW Commission Meetings" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/meetings/

7.4.4 Are timely and reliable statistics available on catch and fishing effort maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies.[2] NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Additional information for shrimp is gathered through the GSS, which utilizes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for details on GSS).[3] Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also posted.[4] Federal Gulf shrimp permit holders are required to report annual landings each year		

through the ALF as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data. Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program (refer to 7.1.7(a) for details).[5] 50 CFR 622.51 requires the reporting activities for both harvesters and dealers in the Gulf of Mexico shrimp fishery (refer to 7.1.7(a) for details.)[6] GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[7,8] SEAMAP Gulf of Mexico Resource Surveys assess the shrimp fishery through the Summer and Fall Shrimp/Groundfish Surveys. The Fisheries Economic Data Program published peer-reviewed economic reports in 2014. These reports assessed the economic landscape of the shrimp industry, providing revenue, operating cost, annual expenditure, employment, and harvesting/harvester data. **Texas:** TPWD meets international standards of data collection through a series of programs including the Trip Ticket Program (and previously through the Month Aquatic Products Reports), the CFD fishery-independent sampling program, and through port surveys conducted by CFD with dealers to augment commercial landings information by sampling catch for composition data: sex, size, age statistics (see 7.1.7 (a) for further details).[9,10,11,12,13] These programs gather the necessary information on total catch, gear and fishing methods, vessel information, location, date, length of trip, and effort data, as well as biological information of the species including age, growth, recruitment, distribution, abundance surveys and environmental factors.		

[1] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[2] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[7] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[8] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[9] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[10] Page Campbell, Ted Storck, Vanenise Price, and Lance Robinson, 1992. Trends in Texas Commercial Fishery Landings, 1972-1991. TPWD MDS No. 86, 1992.
http://www.tpwd.state.tx.us/publications/pwdpubs/media/mds_coastal/Series%202_MDS86.pdf

[11] Jan Culbertson, Lance Robinson, Page Campbell, and Linda Butler, *Trends in Texas Commercial Fishery Landings, 1981-2001*. (TPWD MDS No. 224, 2004)
https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS224.pdf

[12] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005.
http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[13] Vincent Guillory, Harriet Perry, and Steven VanderKooy, *The Blue Crab Fishery of the Gulf of Mexico, United States: A Regional Management Plan* Gulf States Marine Fisheries Commission (Ocean Springs, MS, 2001).
http://www.gsmfc.org/publications/GSMFC%20Number%20096.pdf

7.4.5 Has sufficient knowledge of social, economic and institutional factors relevant to the fishery in question been developed through data gathering, analysis and research?
Yes... [1] Some... [½] No...[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC contains a Social Science Research Group (SSRG) that conducts applied socioeconomic and cultural research on marine resources in the Gulf of Mexico.[1] This research largely focuses on participant and community dependence and engagement in fisheries and is directed by the principles of the MSA National Standard 8.[2] Within the SSRG is a Southeast Shrimp Fisheries research group focuses on data collection and analysis of economic information specific to the shrimp industry. This group conducts the Annual Economic Survey of Federal Gulf Permit Holders each spring. This survey collects information on operating costs, and expenses associated with owning and maintaining shrimp vessels. This information is used to assess trends in the economic state of the Gulf shrimp fishery and determine the impacts of regulation changes and other management actions.[3,4] In 2005, NOAA conducted a series of studies to identify communities associated with the fishing industry and produced a report of the significant fishing communities in Texas.[5] NOAA's Office of Science and Technology has developed social indicators of fishing community vulnerability and resilience, and maintains community profiles of fishing communities throughout the U.S.[6,7] NOAA SERO also maintains community snapshots on its website of fishing communities throughout the Gulf and includes information on the dominant fisheries, fleet characteristics and demographics of each community.[8]		

The GMFMC shrimp FMP also contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a Regulatory Impact Review.[9] **Gulf States:** GSMFC Fisheries Economic Data Program has conducted analyses (similar to the SEFSC Annual Economic Survey) for the inshore (non-federally-permitted) fleet in 2008 and 2012.[10,11,12] Additionally, GSMFC has produced reports on the economic baseline and characterization of dockside seafood dealers, and seafood processors for the U.S. Gulf of Mexico.[13,14] **Texas:** TPWD solicits participation from the entire fishing community and is required by law at both the state and federal level to allow public participation. TPWD conducts scoping meetings, direct stakeholder communications, public hearings, public comment opportunities and advisory committee meetings to address socioeconomic aspects for potential regulation changes.[15,16] When setting new regulations for the fishery, TPWD is required by the Administrative Procedures Act to evaluate local economic impact prior to adoption of any proposal.[17] Economic impact evaluations are included in the proposed rule listing in the *Texas Register* during the open comment period.[18] For example, TPWD held scoping meetings fir shrimp industry stakeholders in December 2014 throughout the coast to discuss potential regulation changes for the fishery. Letters were sent to all current license holders in the shrimp fishery to notify them of the meetings.[19] In April of 2015, TPWD held a meeting for the public to comment on proposed regulation change regarding count/size requirements of commercial shrimping in inside waters, which was a recommendation by industry members during the December 2014 scoping.[20] The 2002 TPWD report to the Governor and 77th Legislature on the Texas shrimp fishery contains a socio-economic characterization of the fishery.[21]		

[1] "Social Science Research Group" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[2] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[3] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[4] NMFS SEFSC. *2011 Economics of the Federal Gulf Shrimp Fishery Annual Report.* NOAA Southeast Fisheries Science Center. December 2013. http://www.sefsc.noaa.gov/docs/2011_Gulf_shrimp_econ_report.pdf

[5] Assessment, Impact. Inc., *Identifying communities associated with the fishing industry in Texas*. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-03-SE-0603. St. Petersburg, FL, 2005. http://www.st.nmfs.noaa.gov/humandimensions/publications/community-profiles-pub/index

[6] "About Social Indicators" *NOAA Office of Science and Technology*. Web. Accessed November 2015. https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index

[7] Jepson and Colburn, 2013. "Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions." NOAA OST http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/S3_Fishing_Com_Vulnerability_Resilience.pdf

[8] "Snapshots of Human Communities and Fisheries in the Gulf of Mexico and South Atlantic" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/

[9] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[10] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[11] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[12] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[13] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[14] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[15] Art Morris, Personal communication. Texas Parks and Wildlife Department. June 2014.

[16] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[17] Tex. Gov. Code § 2001.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.2001.htm

[18] "Texas Register" *The Portal to Texas History*. Web. Accessed June 2015. http://texashistory.unt.edu/explore/collections/TR/

[19] TPWD Letter to Shrimp License Holders. November 20, 2014.

[29] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

[21] TPWD, *The Texas Shrimp Fishery*. Report to the Texas Governor and the 77th Legislature. 2002. https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_v3400_857.pdf

7.4.6 Are fishery-related and other supporting scientific data relating to fish stocks covered by subregional or regional fisheries management organizations or arrangements compiled in an agreed format and provided in a timely manner to the organization or arrangement?

(i) - in an agreed format? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
GMFMC: The GMFMC utilizes data collected through NOAA Fisheries and each of the five Gulf state management agencies. GMFMC maintains a standing Data Collection Committee, which "reviews and advises the Council on the data requirements for managing each fishery, the statistical methodology needed, and on all issues related to data and data collection."[1] The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[2] Landings data are collected by the SEFSC Fisheries Statistics Division from each individual state agency Trip Ticket Reporting Program. Data collection methods are coordinated through the GSMFC FIN to ensure that standardized data are collected, where feasible. All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers on standardized trip ticket forms. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for further detail on the GSS).[3] Trip ticket data from each of the states are verified against port agent sampling data and integrated into the GSS. Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species, and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also posted.[4] All federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data.[5] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program.[6,7] The new eELB program, which began in 2014, transmits the most recent data from vessels directly to the Galveston Lab whenever the vessel is within cellular range. Data collection by observers is carried out in a standard format defined in an observer manual. GSMFC: Fishery-related and other supporting scientific data are gathered individually by each state's management agency and submitted and reviewed regularly by GSMFC. The GSMFC meets twice a year (March and October) to review scientific data and regional management activities. Data on fishery trends in landings, values, and other activities of the fishery are presented by each state and reviewed at each meeting. The GSMFC IJF program also collects data regularly for regional assessments and		

FMP updates of stocks not covered by federal FMPs; data are submitted by the states on request based on the needs of specific projects. GSMFC FMPs are reviewed every five years and updated at intervals determined by the TCC.[8] GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[9,10] NOAA coordinates with SEAMAP through the SEFSC Mississippi Labs on annual fishery-independent surveys. Shrimp/Bottomfish surveys are conducted each Fall and Summer, which are designed to provide a time-series for monitoring trends in resource abundance. Data are made available to state and federal resource managers.[11]		

[1] GMFMC, 2012. Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Commercial Fisheries Statistics" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[5] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[6] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[7] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[8] VanderKooy, Steve. GSMFC. Personal Communication. August, 2014.

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[11] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

7.4.6 (ii) - in a timely manner? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
GMFMC: The GMFMC utilizes data collected through NOAA Fisheries and each of the five Gulf state management agencies. GMFMC maintains a standing Data Collection		

Committee, which "reviews and advises the Council on the data requirements for managing each fishery, the statistical methodology needed, and on all issues related to data and data collection."[1] The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[2] All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Data are submitted by dealers on a monthly basis. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico.[3] Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also posted.[4] All federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal.[5] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program.[6,7] The new cELB program, which began in 2014, transmits the most recent data from vessels directly to the Galveston Lab whenever the vessel is within cellular range. Observer coverage is compiled into annual reports made available to federal and state fisheries managers and posted publically on NOAAs website. <u>GSMFC</u>: Fishery-related and other supporting scientific data are gathered individually by each state's management agency and reviewed regularly by GSMFC. The GSMFC meets twice a year (March and October) to review scientific data and regional management activities. Data on fishery trends in landings, values, and other activities of the fishery are presented by each state and reviewed at each meeting. GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[8,9] SEAMAP Shrimp/Bottomfish surveys are conducted each fall and summer.[10] SEAMAP data are entered into the Fisheries Scientific Computer System (FSCS) and made available to state and federal managers.		

[1] GMFMC, 2012. *Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Commercial Fisheries Statistics" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[5] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[6] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[7] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[8] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[9] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[10] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

7.4.7 With respect to the data collected for management purposes, are applicable confidentiality requirements complied with? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
GMFMC: GMFMC maintains confidentiality of statistics in compliance with 50 CFR 600.130, 600.405, 600.425, and NAO 216-100. The GMFMC may establish policies and procedures applicable to it, its committees, and advisory groups to ensure confidentiality of statistics submitted to GMFMC by federal or state authorities, and private persons. In regards to statistics submitted by a state or federal entity, policies and procedures must be consistent with the laws and regulations of the federal or state entity submitting the statistics.[1] 50 CFR §600.130 requires each regional council to establish procedures for ensuring confidentiality, 50 CFR §600.405 defines the types of statistical information that NOAA is authorized to collect and requires to ensure confidentiality of, and 50 CFR §600.425 pertains to circumstances allowing release or refusal of requested information in compliance with other confidentiality requirements.[2,3,4] NOAA Administrative Order (NOA) 216-100 "prescribes policies and procedures for protecting the confidentiality of data submitted to and collected by the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS) as authorized or required by law; informs authorized users of their obligations for maintaining the confidentiality of data received by NMFS; provides for operational safeguards to maintain the security of data; and states the penalties provided by law for disclosure of confidential data."[5] GSMFC: GSMFC follows NOAA administrative Order 216-100 "Protection of Confidential Fisheries Statistics"[5] and adheres to the "Fisheries Rule of Three," which prevents disclosure of proprietary or confidential commercial of financial information		

regarding fishing and fish processing operations thus preventing the distribution of any fisheries data that would identify a single fisheries entity. GSMFC employees and representatives must sign non-disclosure agreements prior to handling confidential statistics, which includes approval from NMFS. Penalties for unauthorized distribution of confidential fisheries data include both civil and criminal actions and are set out in Federal Statutes- U.S.C. 552 and U.S.C 1905.[6,7] As government entity, TPWD must abide by strict confidentially requirements set forth by both state and federal statutes. Summaries of non-confidential data are disseminated to the public and other agencies.[8] TPWD falls under the Texas Government Code, which provides for the confidentiality of commercial or financial information.[8]		

[1] GMFMC, 2012. *Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures.* http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] 50 C.F.R. § 600.130 http://www.gpo.gov/fdsys/pkg/CFR-2010-title50-vol8/pdf/CFR-2010-title50-vol8-sec600-130.pdf

[3] 50 C.F.R. § 600.405 https://www.law.cornell.edu/cfr/text/50/600.405

[4] 50 C.F.R. § 600.425 https://www.law.cornell.edu/cfr/text/50/600.425

[5] NOA 216-100 https://www.st.nmfs.noaa.gov/st1/recreational/documents/Intercept_Appendices/Appendix%20M%20031408%20NOAA%20administrative%20order%20216-100.pdf

[6] U.S.C. § 552 http://www.justice.gov/oip/blog/foia-update-freedom-information-act-5-usc-sect-552-amended-public-law-no-104-231-110-stat

[7] 18 U.S.C § 1905 http://www.law.cornell.edu/uscode/text/18/1905

[8] "Publications" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/publications/fishboat/fish/fisheries_management/mds_coastal.phtml

[9] Tex. Gov. Code § 552.110 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.552.htm

7.5 Precautionary approach

7.5.1 (a) Has the precautionary approach been applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment?[1] **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
yes	**In Part**	**No**
Federal: The Gulf of Mexico shrimp Fishery is managed by NOAA Fisheries and GMFMC under the requirements of the MSA. The ten National Standards of the MSA provide a robust and precautionary approach to fisheries management. The ten national standards are as follows:[2] 1. Achieve OY and prevent overfishing		

2. Based on best available scientific evidence
3. Manage stocks as a unit
4. Allocations should be fair and equitable, promote conservation, and prevent excessive shares
5. Consider efficiency in utilization; not have economic allocation as sole purpose
6. Allow for variations and contingencies
7. Minimize costs and avoid duplication
8. Consider fishing communities to provide for their sustained participation and to minimize adverse economic impacts
9. Minimize bycatch and bycatch mortality
10. Promote safety of human life at sea

NOAA Fisheries has developed a set of guidelines for each National Standard (NS) and all FMPs, amendments and regulations must comply with the NS Guidelines. These guidelines explicitly require the consideration of uncertainties in setting conservation and management measures, and mandate the determination of biological reference points and harvest control rules to ensure that overfishing is prevented, overfished stocks are rebuilt within reasonable timeframes, and bycatch is minimized. Additionally, a NOAA Technical Memorandum was published providing guidance on the use of precautionary approaches when implementing NS1.[3] The GMFMC shrimp FMP and amendments comply with all aspects of the National Standards.[4]

Limit and target reference points have been established for the fishery. Currently, The target for each stock is MSY. Amendment 13 of the shrimp FMP determined that there is no biological reason to set OY below MSY because penaeid shrimp are annual stocks whose abundance in a given year is dictated primarily by environmental conditions.[5]

Recent changes have been made to the model used in stock assessments for penaeid shrimp in the Gulf of Mexico to improve assessments. Previously, a VPA model was used in Gulf shrimp stock assessments; however, recently the SSC approved a new Stock Synthesis model as the best scientific model available for these species. Due to the changes in the model outputs, the GMFMC has changed to the SDC for penaeid shrimp species to fit with the new assessment model outputs in Amendment 15 of the GMFMC Shrimp FMP.

The new reference points are:[6]

MSY

- Brown shrimp: MSY is 146,923,100 lbs. of tails
- White shrimp: MSY is 89,436,907 lbs. of tails

Overfishing

The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the fishing mortality rate at MSY (F_{MSY}).

- Brown shrimp: 9.12
- White shrimp: 3.48

Overfished

The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}).

- Brown shrimp: SSBMSY is 6,098,824 lbs. of tails
- White shrimp: SSBMSY is 365,715,146 lbs. of tails

These values will be updated every 5 years through the framework procedure, unless changed earlier by the GMFMC.

Penaeid shrimp in the Gulf of Mexico are exempt from requirements for ACLs and Accountability measures (AMs) because they have a life cycle of approximately one year. MSA Section 600.310(h)(2) states:[7]

(2) Exceptions from ACL and AM requirements—(i) Life cycle. Section 303(a)(15) of the Magnuson-Stevens Act" shall not apply to a fishery for species that has a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species" (as described in Magnuson-Stevens Act section 303 note). This exception applies to a stock for which the average length of time it takes for an individual to produce a reproductively active offspring is approximately 1 year and that the individual has only one breeding season in its lifetime. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule.

Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT 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.

Brown shrimp and white shrimp stocks have been monitored by NOAA Fisheries since 1970, and have remained above the minimum thresholds; therefore, have never been determine overfished or overfishing. Recent assessments of the fishery have determined that the current fleet capacity does not have the ability to overfish stocks.[8] Management of the fishery is largely focused on improving economic conditions and reducing bycatch mortality. Management measures in effect include closed areas for the protection of habitat and small shrimp (which protects against growth overfishing), effort limitations, and required use of BRDs and TEDs to minimize bycatch.

The Precautionary Approach is also mandated in the Guidelines to NS9, with regard to minimizing bycatch and bycatch mortality.[9]

The Shrimp FMP set the following objective: "promote consistency with the ESA and MMPA." The shrimp fishery has been evaluated in relation to the ESA and MMPA and is consistent with the requirements established to protect species managed under these acts.

ESA:

Section 7(a)(2) of the ESA requires each federal agency to ensure that any action

they authorize is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of any listed species. In 2014 and update Biological Opinion was done, under the Section 7(a)(2) requirements, for the continued implementation of sea turtle conservation measures applicable to shrimp trawling and the continued authorization of the Southeast shrimp fisheries.[10] The opinion provides information on interactions with any threatened or endangered species, states the amount of incidental of listed species that may occur, specifies reasonable or prudent measures that are required to minimize impacts, requires monitoring of effects, and recommends conservation measures to further conserve listed species. The biological opinion was based on the best available scientific data and considered uncertainties within the evaluation process. The 2014 biological opinion made recommendations for measures to minimize impacts of incidental take to sea turtles and smalltooth sawfish, and concluded that continued authorization of the Southeast shrimp fisheries in federal waters is not likely to jeopardize the continued existence of threatened or endangered species.

MMPA:
NOAA Office of Protected Species conducted a risk assessment of the shrimp fishery to determine potential impacts to marine mammals. The shrimp fishery was determined as a Category II fishery, indicating that the annual mortality or serious injury of a marine mammal stock is greater than 1% but less than 50 % of the stocks potential biological removal (PBR).[11] This requires fishery participants to register with the Office of Protected Species, report any incidences of serious injury or mortality of a marine mammal, and compliance with and take reductions plans that are established. This designation was based primarily on interactions with bottlenose dolphins and there is currently no take reduction plan for bottlenose dolphins in the Gulf of Mexico.

Texas:
There is currently no explicit definition of the precautionary approach at the state level of management. While no formal definition of precautionary approach has been implemented for management of the shrimp fishery in Texas, management has taken measures to ensure prudent foresight, reduce or avoid risk to the resource, the environment, and the people and does take into account existing uncertainties and potential consequences of incorrect or suboptimal management measures. Texas also participates in the GMFMC process and manages the shrimp fishery in state waters consistent with federal management, which is managed under precautionary approach guidelines (as shown above).

[1] FAO 2005-2015. *World inventory of fisheries. Precautionary approach to fisheries management*. Issues Fact Sheets. Text by Serge M. Garcia. Bibliographic citation [online]. Rome. Updated 27 May 2005. [Cited 25 January 2015]. http://www.fao.org/fishery/topic/13302/en

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[4] Restrepo, V.R. et al (1998) "Technical Guidance On the Use of Precautionary Approaches to Implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act" NOAA Technical Memorandum.
http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/documents/ns1_restrepo_et_al_1998.pdf

[5] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[6] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[7] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[8] Nance, James, Walter Keithly, Jr., Charles Caillouet, Jr., John Cole, Wilson Gaidry, Benny Gallaway, Wade Griffin, Rick Hart, and Mike Travis. 2008. *Estimation of effort, maximum sustainable yield, and maximum economic yield in the shrimp fishery of the Gulf of Mexico*. NOAA Technical Memorandum NMFS-SEFSC 570.
http://docs.lib.noaa.gov/noaa_documents/NMFS/SEFSC/TM_NMFS_SEFSC/NMFS_SEFSC_TM_570.pdf

[9] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[10] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225.
http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[11] "List of Fisheries" *NOAA Office of Protected Resources*. Web. Accessed November 2015.
http://www.nmfs.noaa.gov/pr/interactions/lof/

7.5.1 (b) Has the absence of adequate scientific information been used as a reason for postponing or failing to take conservation and management measures? **No...**[1] **Occasionally...** [½] **Often...**[0]

Extent of compliance		
No	**Occasionally**	**Often**
The MSA specifically prevents the absence of scientific information as a reason to postpone conservation and management measures through National Standard 6 (NS6). NS 6 requires the following:[1] - To the extent practicable, FMPs should provide a suitable buffer in favor of conservation. Allowances for uncertainties should be factored into the various elements of an FMP. Examples are: (i) *Reduce OY*. Lack of scientific knowledge about the condition of a stock(s) could be reason to reduce OY. (ii) *Establish a reserve*. Creation of a reserve may compensate for uncertainties in estimating domestic harvest, stock conditions, or environmental factors. (iii) *Adjust management techniques*. In the absence of adequate data to predict the effect of a new regime, and to avoid creating		

unwanted variations, a Council could guard against producing drastic changes in fishing patterns, allocations, or practices. (iv) *Highlight habitat conditions.* FMPs may address the impact of pollution and the effects of wetland and estuarine degradation on the stocks of fish; identify causes of pollution and habitat degradation and the authorities having jurisdiction to regulate or influence such activities; propose recommendations that the Secretary will convey to those authorities to alleviate such problems; and state the views of the Council. The GMFMC shrimp FMP is in compliance with all mandates of the MSA and has not used a lack of scientific information as a basis for not implementing conservation measures.[2] **Texas:** TPWD has also taken several proactive management measures for the shrimp fishery to ensure conservation of the fishery prior to scientific evidence. The Texas Legislature, in the 1930s established a 51/2 inch minimum size limit, a shrimping closure during May-July, and trawl requirements to protect shrimp resources; and, in 1959, the Shrimp Conservation Act overhauled shrimp regulations to better allocate resources among user groups.[3]		

[1] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[2] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015.
http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[3] TPWD, *The Texas Shrimp Fishery*. Report to the Texas Governor and the 77th Legislature. 2002.
https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_v3400_857.pdf

7.5.2/7.5.3 Has there been an attempt to determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), and, at the same time, the action to be taken if they are exceeded?

(i) - Have target reference point(s) been established? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In part**	**No**
Limit and target reference points have been established for the fishery. Currently, The target for each stock is MSY. Amendment 13 of the shrimp FMP established MSY for each stock and determined that there is no biological reason to set OY below MSY because penaeid shrimp are annual stocks whose abundance in a given year is dictated primarily by environmental conditions.[1] Recent changes have been made to the model used in stock assessments for penaeid shrimp in the Gulf of Mexico to improve assessments. Previously, a VPA model		

was used in Gulf shrimp stock assessments; however, recently the SSC approved a new Stock Synthesis model as the best scientific model available for these species. Due to the changes in the model outputs, the GMFMC changed the SDC for penaeid shrimp species to fit with the new assessment model outputs. These changes have been adopted through Amendment 15. The new reference points are:[2] - Brown shrimp: MSY is 146,923,100 lbs. of tails - White shrimp: MSY is 89,436,907 lbs. of tails - Pink shrimp: MSY is 17,345,130 pounds of tails		

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

7.5.2/7.5.3 (ii)- Have limit reference points been established? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In part**	**No**
Currently, the limit reference points for the fishery are set as minimum parent stock size. Overfishing and Overfished thresholds are:[1]		

	overfishing	overfished
brown shrimp	125,000,000 individuals, age 7+ months (November – February)	63,000,000 individuals, age 7+ months (November – February)
white shrimp	330,000,000 individuals, age 7+ months (May – August)	165,000,000 individuals, age 7+ months (May – August)
Pink shrimp	100 million individuals, age 5+ months (July – June)	50 million individuals, age 5+ months (July – June)

Brown, white and pink shrimp stocks have been monitored by NOAA Fisheries since 1970, and have remained above the minimum parent stock size thresholds; therefore, have never been determine overfished or overfishing. The 2007 stock assessment for pink shrimp did initially find that pink shrimp were experiencing overfishing; however, it was determined that the traditional model used (VPA) could not accommodate low effort and the finding of overfishing was not accurate. This prompted a change in the model used for shrimp assessments, which are now conducted with a Stock Synthesis Model approved by the GMFMC SSC as the best available model for this species.[2]

Changes to the model used in stock assessments for penaeid shrimp in the Gulf of Mexico from a VPA model to a Stock Synthesis model required changes to the SDC for penaeid shrimp species to fit with the new assessment model outputs.

These changes have recently been adopted through Amendment 15. The new reference points are:[2] **Overfishing:** The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the fishing mortality rate at MSY (F_{MSY}). - Brown shrimp: F_{MSY} = 9.12 - White shrimp: F_{MSY} = 3.48 - Pink shrimp: F_{MSY} = 1.35 **Overfished:** The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}). - Brown shrimp: SSB_{MSY} is 6,098,824 pounds of tails - White shrimp: SSB_{MSY} is 365,715,146 pounds of tails - Pink shrimp: SSB_{MSY} is 23,686,906 pounds of tails These values will be updated every 5 years through the framework procedure, unless changed earlier by the GMFMC.		

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] Nance, J. M. 2008. Review of the status and health of the shrimp stocks for 2007. Report to the Gulf of Mexico Fishery Management Council. August 2008. 6 pp. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/BB%202008-08/D%20-%203%20NMFS%20Status%20&%20Health%20of%20Shrimp%20Stocks.pdf

[3] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

7.5.2/7.5.3 (iii) - Have data and assessment procedures been installed measuring the position of the fishery in relation to the reference points established? **Yes...** [1]**Some...** [½]**No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the Gulf of Mexico shrimp fishery and produces an annual stock assessment report for each shrimp species.[1] GMFMC SSC and Standing Shrimp SSC review stock assessments annually to determine the status of the fishery against established reference points. The current stock assessment model, updated in 2012, now produces different outputs than the previous VPA model that was used at the time reference points were set. GMFMC and NOAA Fisheries have recent updated the SDC for shrimp to match the current model outputs.[2]		

[1] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

7.5.2/7.5.3 (iv) - Have management actions been agreed to in the eventuality that data sources and analyses indicate that these reference points have been exceeded? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Penaied shrimp in the Gulf of Mexico are exempt from requirements for Annual Catch Limits (ACLs) and Accountability measures (AMs) because they have a life cycle of approximately one year. MSA Section 600.310(h)(2) states:[1] (2) *Exceptions from ACL and AM requirements*—(i) *Life cycle*. Section 303(a)(15) of the Magnuson-Stevens Act" shall not apply to a fishery for species that has a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species" (as described in Magnuson-Stevens Act section 303 note). This exception applies to a stock for which the average length of time it takes for an individual to produce a reproductively active offspring is approximately 1 year and that the individual has only one breeding season in its lifetime. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule. Amendment 15 updating the SDC for shrimp, also updated actions to be taken should reference points be exceeded as follows:[2] - "Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT 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." Furthermore, the MSA Section 305 (c) allows for the promulgation of emergency actions. The Secretary of Commerce may promulgate an emergency regulation to respond to an emergency, overfishing, public health or oil spill event, or at the request of GMFMC.[3] Such emergency regulations may remain in effect until the circumstance no longer existed, provided that there is an opportunity for public comment after the rule is published. Emergency regulations may address the following situations: - Ecological- to prevent overfishing or other serious damage to the resource or habitat - Economic- to prevent a significant direct economic loss - Social- to prevent a significant community impact or conflict between user group - Public Health- to prevent significant adverse health effects to fishery participants and/or consumers		

[1] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[3] NMFS. *Policy Guidelines for Use of Emergency Rules.* January 2007.
http://www.nmfs.noaa.gov/sfa/management/councils/training/2014/c_h2_policy_directive_01-101-07.pdf

7.5.5 (a) Have contingency plans been agreed to in advance on the appropriate temporary management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the resource?
Yes...[1]Some...[½]No...[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Based on MSA Section 600.310 (h)(2), penaeid shrimp in the Gulf of Mexico are exempt from requirements for ACLs and Accountability measures (AMs) because they have a life cycle of approximately one year; however, they are still required to have SDC, MSY, OY, ABC, and an ABC control rule.[1] The current actions defined in the event that stock should drop below limit reference points are established in Amendment 15 as follows:[2] "Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT 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." Additionally, the MSA Section 305 (c) allows for the promulgation of emergency actions. The Secretary of Commerce may promulgate an emergency regulation to respond to an emergency, overfishing, public health or oil spill event, or at the request of GMFMC.[3] Such emergency regulations may remain in effect until the circumstance no longer existed, provided that there is an opportunity for public comment after the rule is published. Emergency regulations may address the following situations: - Ecological: to prevent overfishing or other serious damage to the resource or habitat - Economic: to prevent a significant direct economic loss - Social: to prevent a significant community impact or conflict between user groups - Public Health: to prevent significant adverse health effects to fishery participants and/or consumers **Texas:**		

TPWD closely monitors biological and environmental aspects of coastal fisheries through rigorous independent sampling programs and coordinates with other agencies for additional information on environmental parameters, natural phenomena and human impacts. Significant natural phenomena, human impact events, or concerning change in trends detected through these programs triggers specialized study and/or management actions depending on the severity and cause. In 2005, TPWD adopted a Thermal Refuge regulation to close specified fishing areas during atypical freeze events.[4] The Department of State Health Services (DSHS) also regulates closures based on hazardous chemical contamination and issues either retention bans, or consumption advisories for areas of concern due to HABs, oil or chemical spills.[5,6] There are currently no predetermined actions specific to addressing overfishing in the shrimp fishery; however, Texas Parks and Wildlife Code, Section 12.027 does provide for temporary emergency measures by granting authority to either TPWC or the Executive Director of TPWD to adopt emergency rules in the event that there is an immediate danger to a species regulated by the department.[7] Such rulings become immediately effective upon filing and are published as Notices of Emergency Adoption in the *Texas Register*.[8]		

[1] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[3] NMFS. *Policy Guidelines for Use of Emergency Rules.* January 2007.
http://www.nmfs.noaa.gov/sfa/management/councils/training/2014/c_h2_policy_directive_01-101-07.pdf

[4] "Saltwater Freeze Events" *Texas Parks and Wildlife Department*. Web. Acessed June 2015.
http://www.tpwd.state.tx.us/regulations/outdoor-annual/fishing/general-rules-regulations/saltwater-freeze-events

[5] "Seafood and Aquatic Life Group" *Department of State Health Services (DSHS)*. Web. Accessed June 2015.
http://www.dshs.state.tx.us/seafood/

[6] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015).
http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[8] Tex. Parks and Wild. Code §12.027 http://law.onecle.com/texas/parks/12.027.00.html

[9] "Texas Register" *The Portal to Texas History*. Web. Accessed June 2015.
http://texashistory.unt.edu/explore/collections/TR/

7.5.5 (b) Have these emergency (temporary) responses been agreed to due to:

(i) - natural phenomena adversely impacting the stock? **Yes**...[1] **In Part**...[½] **No**...[0]

Extent of compliance		
Yes	**In Part**	**No**
At both the state and federal level, responses to natural phenomena adversely impacting the stock would follow the same procedures and emergency actions detailed above in response to 7.5.5(a).		

7.5.5 (b)(ii) - fishing adversely impacting the stock? **Yes**...[1] **In Part**...[½] **No**...[0]

Extent of compliance		
Yes	**In Part**	**No**
At both the state and federal level, responses to fishing adversely impacting the stock would follow the same procedures and emergency actions detailed above in response to 7.5.5(a).		

7.6 Management measures

7.6.1 Is the level of fishing permitted commensurate with the current state of the fishery resources? **Yes...**[1] **In Part**...[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
Federal: The Gulf of Mexico shrimp fishery requires a Gulf of Mexico Shrimp Permit (GMSP) to operate in federal waters of the EEZ, and is currently under a 10-year permit moratorium. No new permits have been added to the fishery since 2005. Permits may be transferred; however, permits that are not renewed or transferred are terminated and will no longer be issued for the fishery. The permit moratorium was put in place by Amendment 13 based on economic goals for the fishery and Amendment 13 notes "that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource."[1] Since the implementation of the moratorium, license numbers have been reduced from 1933 permits in 2007 to 1470 permits in 2014.		

Year	Number of Valid Permits Each Year	Number of Surrendered Permits Each Year	Number of Permits Terminated Each Year*	Cumulative Number of Permits Lost from the Fishery
2007	1,933	0	NA	NA
2008	1,907	0	26	26
2009	1,722	1	184	211
2010	1,633	1	88	300
2011	1,582	0	51	351
2012	1,534	0	48	399
2013	1,501	0	33	432
2014	1,470	0	31	463

Source: NMFS Southeast Regional Office (SERO) Permits Database

The ten-year moratorium put in place by Amendment 13 expires in December of 2016 and the GMFMC recently approved Amendment 17A, which will extend the moratorium for another 10 years. GMFMC is currently working on Amendment 17B to determine the optimal number of permits for the fishery. Amendment 17A and the draft Amendment 17B both provide updated analyses of the shrimp fleet.[2,3] indicate that the current number of permits in the fishery is not capable of overfishing any stocks.[2] This is consistent with previous analyses in 2006 and 2008 indicating that effort in the fishery has been operating well below MSY for several years.[4,5]

Texas: In 1995, the Texas Inshore Bay and Bait Shrimp License Buyback Program was implemented.[6] Due to increased effort in the inshore fisheries (Bay and Bait shrimpers), concern was raised about biological pressure on the stock and loss of larger shrimp to the Gulf and federal offshore fleets and a license limitation and buyback program was implemented with the goal of reducing inshore shrimping effort by 50%. The Shrimp License Management Program established limited-entry requirements for the Bay and Bait shrimp fisheries, established a voluntary buyback system, created definitions of flagrant offenses and license suspension and revocation penalties for violations, and limited vessel upgrade option to prevent increased effort under current licenses available.[7] When the program began, there were over 3200 licenses in the Bay and Bait fisheries; as of 2015, there are now less than 800 licenses, which has exceeded the target reduction goal of the program.[8] In 2005, a limited entry system was also implemented for Texas Gulf shrimp licenses in conjunction with the limited entry system established for federal waters by GMFMC.[9] These programs have been successful in reducing license numbers and maintaining effort levels that prevent overfishing, as is evidenced by recent stock assessments.		

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Amendment 17A to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. March 2005. http://gulfcouncil.org/docs/amendments/Final%20Shrimp%20Amendment%2017A.pdf

[3] GMFMC. *Draft options paper for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. March 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-04-2016/D%20-%207%20Shrimp%2017b-%20OY%20and%20Permit%20Pool%20032516.pdf

[4] GMFMC Ad Hoc Shrimp Effort Working Group. "Estimation of Effort, Maximum Sustainable Yield, and Maximum Economic Yield in the Shrimp Fishery of the Gulf of Mexico" 2006. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL_AdHocEffortReport_1.pdf

[5] Nance, James, Walter Keithly, Jr., Charles Caillouet, Jr., John Cole, Wilson Gaidry, Benny Gallaway, Wade Griffin, Rick Hart, and Mike Travis. 2008. *Estimation of effort, maximum sustainable yield, and maximum economic yield in the shrimp fishery of the Gulf of Mexico*. NOAA Technical Memorandum NMFS-SEFSC 570. http://docs.lib.noaa.gov/noaa_documents/NMFS/SEFSC/TM_NMFS_SEFSC/NMFS_SEFSC_TM_570.pdf

[6] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[7] 31 Tex. Admin. Code §58.130 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=130

[8] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

[9] Tex. Parks & Wild. § Code 77.151 http://codes.findlaw.com/tx/parks-and-wildlife-code/parks-wild-sect-77-151.html

7.6.2 Are fishing vessels allowed to operate on the resource in question without specific authorization? ***Yes***...[0] ***Some***...[½] ***No***...[1]

Extent of compliance		
No	**some**	**no**
Federal: GMFMC requires all vessels intending to harvest shrimp in EEZ waters to be in possession of the appropriate permit. No new permits will be issued, as a permit moratorium is currently in effect.[1] The U.S. Code of Federal Regulations prohibits any person without a permit, license, or endorsement from engaging in an activity which requires a valid Federal permit, license, or endorsement.[2] **Texas:** Since 1996, a moratorium has been in effect for the Texas shrimp fishery. Anyone fishing for shrimp for personal use from salt water must obtain a fishing license and saltwater fishing stamp endorsement.[3] Anyone fishing commercially for shrimp must obtain a general commercial fisherman's license (except for individuals in possession of a shrimp boat captain's license).[4] A Resident Commercial Shrimp Boat Captain's license or a Resident Commercial Gulf Shrimp Boat license is required of any person who operates a commercial shrimp boat in public waters of Texas or Gulf waters. Resident Commercial Bay Shrimp Boat and Resident Commercial Bait Shrimp Boat licenses may also be required, depending on the location of fishing efforts.[5] Individual bait shrimp trawlers must have an Individual Bait Shrimp Trawl Tag in their possession while trawling.[6] Non-residents must also obtain permits to fish in Texas and Gulf waters (Non-Resident Commercial Gulf Shrimp Boat, Non-resident Commercial Shrimp Boat Captain, Non-Resident Commercial Bay Boat, Non-Resident Commercial Bait Boat).[7] TPWD Game Wardens conduct inspections by boat and on land to ensure that all vessels actively fishing have proper authorization.[8]		

[1] GMFMC. *Commercial Fishing Regulations for Gulf of Mexico Federal Waters.* January 2015. http://gulfcouncil.org/fishing_regulations/CommercialRegulations.pdf

[2] 50 C.F.R. § 622.13 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_113

[3] "Shrimp Regulations & Restrictions" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/regulations/outdoor-annual/fishing/shellfish-regulations/shrimp-regulations

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] "Commercial Licenses" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/business/licenses/public/commercial/

[6] "Shrimp Regulations & Restrictions" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/regulations/outdoor-annual/fishing/shellfish-regulations/shrimp-regulations

[7] "Commercial Licenses" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/business/licenses/public/commercial/

[8] "Texas Game Wardens" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.texas.gov/warden/

7.6.3 (a) Have attempts been made to measure fleet capacity operating in the fishery?
Yes... [1] Some... [½] No...[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Kirkely et al. (2006) includes an analysis of the Gulf of Mexico shrimp fishery to determine the level of overcapacity and costs associated with reducing overcapacity within the fleet.[1] This analysis utilized the average annual yield of shrimp between 1981 and 2001 (101.6 million pounds) as an equivalent to MSY, and used this as the target level in determining the overcapacity of the fishery. The fishery was broken down into subgroups; capacity was determined for each division and then extrapolated to estimate total fleet level activity. Amendment 13 of the Gulf of Mexico Shrimp FMP established a 10-year moratorium on the issuance of commercial shrimp vessel permits capping the number of vessels in the federal fishery.[2] Amendment 13 notes that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource; however, economically the fishery has been operating at a negative profit margin, and a fewer number of vessels in the fishery would allow more profitable harvest of available shrimp resources. The 10-year moratorium put in place by Amendment 13 expires in December of 2016. The GMFMC recently adopted Amendment 17A extending the moratorium for an additional 10 years.[3] GMFMC and NOAA Fisheries are currently working to assess the capacity of the fishery and determine the appropriate number of permits through Amendments 17B.[4] For additional details, refer to 7.1.8(a). **Texas:** Fleet capacity for the Texas shrimp fishery can be measured by the number of active fishing licenses. Texas currently requires one of the following licenses (for either residential or non-residential) if harvesting shrimp in state waters:[5] - Commercial Shrimp Boat Captain's License (residential or non-residential) - Commercial Gulf Shrimp Boat (residential or non-residential) - Commercial Bait Shrimp Boat (residential or non-residential) For recreational shrimping, an individual must possess a Bait-Shrimp Trawl Tag and only one ttrawl per boat is allowed.[6] TPWD monitors the number of licenses and gear used. The Trip Ticket Program was implemented to allow for greater detail in measuring effort and harvest data.[7,8] The Trip Ticket Program collects data on a trip basis requiring reporting of vessel number, gear type, hours fished and harvest data. In 2003, Funk et al. utilized models to analyze the Bay and Bait License Reduction Program and calculated the excess capacity of the Bay shrimp fishery and determined that there were still 289 excess vessels in the fishery.[9] Considering that approximately 50% of licenses purchased in the buyback program, it was estimated		

that it would take about 15 years to reach the target goal. However, increases in import competition caused a drops in shrimp prices and, coupled with increases in fuel prices, the fishery has seen significant reductions and the combined Bay and Bait fisheries are now under 800 total licenses as of 2015.[10]		

[1] James E. Kirkley, John M. Ward, James Nance, Frank Patella, Karyl Brewster-Geisz, Chris Rogers, Eric Thunberg, John Walden, Will Daspit, Brad Stenberg, Steve Freese, Jim Hastie, Stephen Holiman, and, Mike Travis, 2006. *Reducing Capacity in U.S. Fisheries*. NOAA Technical Memorandum NMFS-F/SPO-76. http://spo.nmfs.noaa.gov/tm/tm76.pdf

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Amendment 17A to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. March 2005. http://gulfcouncil.org/docs/amendments/Final%20Shrimp%20Amendment%2017A.pdf

[4] GMFMC. *Draft options for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-%205%20Shrimp%2017b-%20OY%20and%20Permit%20Pool.pdf

[5] "Shrimping Regulations & Restrictions" *Texas parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/regulations/outdoor-annual/fishing/shellfish-regulations/shrimp-regulations

[6] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[7] Donaldson, D. 2004. Overview of State Trip Ticket Programs in Gulf of Mexico. SEDAR7-DW-20 http://sedarweb.org/docs/wpapers/SEDAR7_DW20.pdf

[8] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[9] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[10] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

7.6.3 (b) Have mechanisms been established where excess capacity exists to reduce capacity to levels commensurate with sustainable use of the resource? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: Amendment 13 of the Gulf of Mexico Shrimp FMP established a 10-year moratorium on the issuance of commercial shrimp vessel permits capping the number of vessels in the federal fishery.[1] Amendment 13 notes that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource; however, economically the fishery has been operating at a negative profit margin, and a fewer number of vessels in the fishery would allow more profitable harvest of available shrimp resources. Amendment 13 also notes that, due to competition with foreign imports and rising fuel costs, the number of vessels in the fleet has declined and was expected to		

continue to decline until approximately 2012 when the number of participants reached a more profitable level. Since the implementation of the moratorium, license numbers have been reduced from 1933 permits in 2007 to 1470 permits in 2014 and are continuing to decline.[2] The 10-year moratorium put in place by Amendment 13 expires in December of 2016. The GMFMC recently adopted Amendment 17A to extend the moratorium for an additional ten years.[3] Amendment 17B is currently under development to determine the optimal number of permits for the fishery.[4]

GMFMC has determined limit reference points for the fishery and defined actions to be taken if limit reference points are exceeded. The current actions defined in the event that stock should drop below limit reference points are:[5]

> "If the parent stock levels are reduced below the specified index level for a species, NOAA Fisheries will advise the GMFMC and closely monitor the stock. Scientists will forecast recruitment for the coming year-class and determine the amount of fishing effort that will allow the parent stock to exceed the minimum index value. Scientists will also project the expected fishing effort to be expended on that year-class and its effect on the parent stock. The differences between the amount of fishing effort required to increase the parent stock and the expected fishing effort will be compared to see if further action is necessary. If the parent stock for the species is predicted to remain below the index for a second consecutive year, GMFMC will implement any of the following actions deemed appropriate:
>
> - If fishing effort needs to be reduced, there are multiple options such as reducing fishing effort at the start of the season, reducing fishing effort at the end of the season, or some combination of both, area and seasonal closures, trip limits, or quotas. This action would be accomplished by regulatory amendment and would include a regulatory impact review and environmental assessment."

Texas:

In 1995, the Texas Inshore Bay and Bait Shrimp License Buyback Program was implemented.[6] Due to increased effort in the inshore fisheries (Bay and Bait shrimpers), concern was raised about biological pressure on the stock and loss of larger shrimp to the Gulf and federal offshore fleets and a license limitation and buyback program was implemented with the goal of reducing inshore shrimping effort by 50%. The Shrimp License Management Program established limited-entry requirements for the Bay and Bait shrimp fisheries, established a voluntary buyback system, created definitions of flagrant offenses and license suspension and revocation penalties for violations, and limited vessel upgrade option to prevent increased effort under current licenses available.[7] When the program began, there were over 3200 licenses in the Bay and Bait fisheries; as of 2015, there are now less than 800 licenses, which has exceeded the target reduction goal of the program.[8] In 2005, a limited entry system was also implemented for Texas Gulf shrimp licenses in conjunction with the limited entry system established for federal waters by GMFMC.[9]

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[3] GMFMC. *Amendment 17A to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. March 2005. http://gulfcouncil.org/docs/amendments/Final%20Shrimp%20Amendment%2017A.pdf

[4] GMFMC. *Draft options for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-%205%20Shrimp%2017b-%20OY%20and%20Permit%20Pool.pdf

[5] GMFMC. *Amendment 5 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.1991. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-05%20Draft%201991-01.pdf

[6] Robin Riechers, Wade Griffin, Richard Woodward. *The Texas Inshore Bay and Bait License Buyback Program*. TPWD. 2003. https://swfsc.noaa.gov/assets/202873B6-0DBF-4800-B4D4-149E5719E607.pdf

[7] 31 Tex. Admin. Code §58.130 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=130

[8] TPWD Shrimp Industry Scoping Meeting, Rockport, TX December 9, 2014. Meeting notes.

[9] Tex. Parks & Wild. § Code 77.151 http://codes.findlaw.com/tx/parks-and-wildlife-code/parks-wild-sect-77-151.html

7.6.5 Has the fishery been regulated in such a manner that conflict among fishers using different vessels, gear and fishing methods are minimized? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
The original shrimp FMP implemented in 1981 identified several areas of user conflicts both with direct use of shrimp resources and with other marine resource users.[1] Direct users include recreational, live-bait, and commercial harvesters and both inshore and offshore fleets. 1) Conflicts have arisen between direct users over preferred size of harvest. Some users prefer smaller shrimp typically harvested inshore, especially for the live-bait industry; however, offshore vessels harvest larger shrimp for food consumption. Most states have developed seasons for harvest of shrimp designed to accommodate multiple user needs. Additionally, area and seasonal closures (Texas closure and Tortugas closure) have also been set for federal waters to allow for protection of smaller shrimp in some areas until they reach a larger size. In Texas, the specific shrimp seasons are set for Bay, Bait and Gulf licenses and harvest times are based on typical shrimp size certain times of the year. TPWD also conducts sampling each year to determine certain season dates based on shrimp size.[2,3] Other states have similar regulations for various direct user groups and conflicts have largely been minimized. 2) Other direct user conflicts have occurred between ethnic groups within the commercial shrimp fishery. A large influx of Vietnamese fishermen in to		

1970s caused conflicts with local fishermen; however, programs developed by state agencies and others including translation of regulations materials into Vietnamese, and education programs have helped reduce conflicts.[4]

Conflicts with other fisheries and user groups have also been identified.

1) High incidental catch of finfish and shellfish has created conflicts between shrimps and other fisheries that may utilize species discarded by the shrimp fishery. Juvenile groundfish and other species are typically not retained by shrimpers because there is low economic value for them and retaining them would reduce available space for retaining shrimp catch. Regulations developed to reduce bycatch including required BRDs have significantly decreased bycatch of finfish within the shrimp fishery and additional actions, including effort reductions and seasonal closures (if needed) have also helped in reducing bycatch.[5, 6]
2) Incidental take of sea turtles has created significant conflicts between commercial shrimpers and environmental groups. Requirements for Turtle Excluder Devices (TEDs), and guidelines on proper handling, resuscitation and release of sea turtles have significantly reduced sea turtle mortality in the Gulf of Mexico shrimp fishery.[7,8,9] Additionally, the shrimp industry, federal and state agencies have also been active in other conservation efforts to aid the recovery of sea turtle populations including head-start programs to raise hatchling sea turtles in captivity for later release, nest protection programs in Florida, Texas and Mexico, and education programs to raise awareness among user groups regarding sea turtle conservation actions.[10,11]
3) Gear conflicts between shrimpers and stone crab fishermen. The GMFMC shrimp FMP directly addresses conflicts between the shrimp and stone crab fisheries and established five zones within the EEZ to separate shrimp trawling and stone crab trap activity.[12]
4) Gear conflicts also occur in state waters between shrimpers and blue crab fishermen. Each of the five Gulf states, including Texas, has established trap identification and visibility requirements, restrictions on harvest hours, seasonal and area closures and derelict trap removal programs that all serve to reduce interactions between shrimp traps and crab traps.[13,14,15]
5) Underwater obstructions that cause loss of gear or trawlable bottom areas in the Gulf include artificial reefs, and oil and gas activities/structures, among others. Measure 10 of the shrimp FMP adopted by the council is "The GMFMC will attempt to reduce, where feasible, the loss of offshore trawlable bottom by establishing within GMFMC a committee to monitor and review construction of offshore reefs, with attention to the needs of reef fish, and shrimp user groups." Furthermore, the Texas Sea Grant program developed "hang" books as a guide for shrimp vessels in the Gulf of Mexico documenting bottom obstructions and areas to avoid trawling due to potential interactions.[16,17,18] Additionally, there are federal laws in place that provide for compensation to fishermen to cover damage to gear and vessels from underwater obstructions.

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[3] Tex. Parks and Wild. Code § 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

[4] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[5] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[6] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" PowerPoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[7] 50 CFR § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[8] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[9] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[10] "Sea Turtles" *NOAA Fisheries Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/seaturtles/index.html

[11] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 47. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[12] GMFMC. *Amendment 3 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://gulfcouncil.org/fishery_management_plans/shrimp_management.php

[13] 31 Tex. Admin. Code § 57.973 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=57&rl=973

[14] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[15] Derelict Trap Task Force. 2008. *Guidelines for Developing Derelict Trap Removal Programs in the Gulf of Mexico.* Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20154.pdf

[16] GMFMC, 1981

[17] Gary Graham, David Veal, and Bill Hosking. *"Hangs" and Bottom Obstructions of the Mississippi/Alabama Gulf*. TAMU-SG-83-505. Texas Sea Grant, 1983 http://texasseagrant.org/assets/uploads/publications/1983/83-505.pdf

[18] Gary Graham. *Bottom Fishing Obstructions: Texas/Louisiana Gulf*. TAMU-SG-76-502. Texas Sea Grant. 1975. http://texasseagrant.org/assets/uploads/publications/1976/76-502.pdf

7.6.6 In the course of deciding on use, conservation and management of the resource, were relevant national laws and regulations relating to the traditional practices needs and interests of indigenous people and local fishing communities highly dependent on these resources for their livelihood taken into account? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
There are no indigenous groups identified in Texas that rely on or utilize fishery resources in traditional practices; however, several coastal communities in Texas have been identified as fishing communities.[1] NOAA Fisheries and TPWD address the needs of these communities through industry engagement activities including industry task forces, scoping meetings and public hearings and accepts public comment in person at meetings and in writing via mail or email.[2,3,4,5,6,7,8] The draft proposal for GMFMC Amendment 17 contains updated analysis of fishing communities across the Gulf, community dependence on Gulf shrimp and community resilience.[9]		

[1] Assessment, Impact. Inc., *Identifying communities associated with the fishing industry in Texas*. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-03-SE-0603. St. Petersburg, FL, 2005. http://www.st.nmfs.noaa.gov/humandimensions/publications/community-profiles-pub/index

[2] Art Morris, Personal communication. Texas Parks and Wildlife Department. June 2014.

[3] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[4] Tex. Gov. Code § 2001.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.2001.htm

[5] "Texas Register" *The Portal to Texas History*. Web. Accessed June 2015. http://texashistory.unt.edu/explore/collections/TR/

[6] TPWD. Letter to Shrimp License Holders. November 20, 2014.

[7] "News Release: April 20, 2015. Taking Public Comment on Shrimp and Oyster Regulation Proposals" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150420b

[8] GMFMC, 2012. *Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[9] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

7.6.7 Have the cost-effectiveness and social impact been considered in the evaluation of alternative conservation and management measures? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: The MSA National Standards require consideration of cost-effectiveness and social		

impact when determining conservation and management measures. See response to 7.2.1(b) for full details. **Texas:** TPWD holds scoping meetings, public hearings and public comment periods for each new regulation change/addition, which allow TPWD to explore the economic and social impacts of various management strategies prior to setting regulations.[1] Additionally, TPWD will convene specific advisory boards to assist in the development of new management actions, such as the development of the Texas Shrimp FMP.[2] A standing Coastal Resources Advisory Committee is also maintained by TPWD to advise the department on a wide variety of coastal issues and potential regulation changes.[3]		

[1] "Commission Meetings" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/meetings/

[2] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

[3] 31 T.A.C. §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

7.6.8 Are procedures in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information?

(i) - Have review procedures been established? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The Gulf of Mexico Fishery Management Council (GMFMC) develops Fishery Management Plans (FMPs) for specific fisheries in the Gulf's Exclusive Economic Zone (EEZ). GSFMC proposed management measures become federal regulations through the implementation of these rules by the Secretary of Commerce. The regulations and FMPs are reviewed annually and updated/modified after public review to accommodate changing conditions and needs of the industry or fishery.[1] GMFMC and the National Marine Fisheries Service (NMFS) also use the electronic logbook (ELB) program to assess the status of shrimp stocks in the Gulf of Mexico.[2] The ELB program provides data on Gulf shrimping efforts that allows both GMFMC and NMFS to review current regulations and determine the impact of proposed management measures.[3] NMFS follows set procedures for regulation revision. The Assistant Administrator for Fisheries (AA) is responsible for considering petitions to amend and reviewing existing regulations for possible revision or revocation. Existing rules chosen for review include (but are not limited to) those regulations: • For which there is no relevant need • Which have received significant complaints or suggestions • Which carry heavy burdens on those affected		

• Which need clarification • Which are duplicated • Which have not been evaluated in three or more years A review notice is included in the Regulatory Agenda. The Regulatory Flexibility Act requires an examination of what impacts the rule change may have on a substantial number of small entities (businesses, organizations, governmental jurisdictions).[4] **Texas:** TPWD has an annual review process in place, in which each ecosystem manager reviews the harvest and resource data, public concerns and observations, then presents proposed strategies at director meetings where they are prioritized based on biological and/or public needs.[5] The Texas Sunset Act, adopted in 1977, requires the review of all government agencies every 12 years to determine agency efficiency and purpose and has power to abolish an agency if it is no longer necessary.[6] The Sunset Advisory Commission that conducts the review provides a final report with recommendations. Additionally, section 2001.039 of the Texas Government Code also requires state agencies to review and readopt, amend, or repeal each rule under its jurisdiction at least once every four years.[7]		

[1] "Fishery Management Plans and Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/index.php

[2] "SPGM Electronic Log Book" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/

[3] GMFMC. *Framework Action to Establish Funding Responsibilities for the Electronic Logbook Program in the Shrimp Fishery of the Gulf of Mexico*. 2013. http://gulfcouncil.org/docs/amendments/Final%20Shrimp%20ELB%20Abbreviated%20Framework.pdf

[4] NMFS. *Operational Guidelines, Fishery Management Plan Process*. Silver Springs, MD, 1997. http://www.nmfs.noaa.gov/sfa/domes_fish/OperationalGuidelines/OGdevelop_regs.htm#existing

[5] Paul Hammerschmidt, Paul. Personal Communication. TPWD. June 2014.

[6] Tex. Gov. Code § 325.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.325.htm

[7] Tex. Gov. Code § 2001.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.2001.htm

7.6.8 (ii) - Does a flexible mechanism for revision of management measures exist?
Yes... [1] Some... [½] No...[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Similar to the above answer, regulations and FMPs created and proposed by GMFMC are reviewed annually and updated/modified after public review to		

accommodate changing conditions and needs.[1] Amendments may be made to original FMPs. In order for an amendment to be implemented, it must go through a scoping process, where GMFMC gathers suggestions and ideas for all stakeholders. Public hearings are held to gain feedback on potential impacts and alternative strategies. Once these two actions have been completed, GMFMC must take final action by choosing an appropriate management measure by creating a rule that is necessary and appropriate for the implementation of the amendment. Once approved by the Secretary of Commerce, the rule is published in the Federal Register. On a national level, the NOAA Fisheries is tasked with examining the impacts of proposed rules on small entities, guiding the promulgation of new rules, and reviewing the need for existing rules.[2] This process of revision is open to the public, allowing anyone to petition NMFS (pursuant to 5 U.S.C. 553(e)) to issue, amend or repeal a rule.[3] Through these processes, both GMFMC and NMFS allow for flexibility within the management of the Gulf shrimp industry. **Texas:** TPWD has an annual review process in place, in which each ecosystem manager reviews the harvest and resource data, public concerns and observations, then presents proposed strategies at director meetings where they are prioritized based on biological and/or public needs.[4] Proposals then go through a public scoping process prior to presentation to TPWC. The proposed rule is published in the *Texas Register* for a 30-day comment period and public hearings are held throughout the state.[5] At the end of the 30-day period, the proposed regulations are modified, if necessary, based on public comment, and then presented to the commission for adoption. If approved by TPWC, the new regulation is published in the *Texas Register* and the regulation becomes effective 20 days after publication.		

[1] "Fishery Management Plans and Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/index.php

[2] NMFS. *Operational Guidelines, Fishery Management Plan Process*. Silver Springs, MD, 1997. http://www.nmfs.noaa.gov/sfa/domes_fish/OperationalGuidelines/OGdevelop_regs.htm#existing

[3] NMFS. *Operational Guidelines, Fishery Management Plan Process*. Silver Springs, MD, 1997. http://www.nmfs.noaa.gov/sfa/domes_fish/OperationalGuidelines/OGdevelop_regs.htm#existing

[4] Paul Hammerschmidt, Paul. Personal Communication. TPWD. June 2014.

[5] "Texas Register" *The Portal to Texas History.* Web. Accessed June 2015. http://texashistory.unt.edu/explore/collections/TR/

7.6.9 (a) Are appropriate measures being applied to minimize:

(i) - waste and discards? **Yes...** [1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	Initial bycatch ratio estimates for the Gulf of Mexico shrimp fishery from 1970s were approximately 10:1 (bycatch to shrimp), with some estimates based on season and area as high as 13.7:1.[1] Since that time, the implementation of turtle excluder devices (TEDs), bycatch reduction devices (BRDs) and significant reductions in shrimp effort have all contributed to considerable reduction in the bycatch of this fishery. Estimates in 2009 concluded that bycatch ratios had remained consistent at approximately 4:1 since 2000, and the 2012 report by Scott-Denton et al, utilizing observer data, determined that total bycatch to shrimp ratios dropped to 2.5:1 (2:1 for finfish to shrimp).[2,3] Currently, observer data are the only long-term data set documenting bycatch of the fishery and observer coverage is limited (1-2%coverage in the federal fleet and a small number of observers on inshore skimmer vessels). **<u>Federal</u>:** Several regulations have been designed to minimize waste and discards in the shrimp fishery. According to the U.S. Code of Federal Regulations, shrimp trawl vessels must have a certified bycatch reduction device (BRD) installed on each net for fishing on their vessel.[4] to be certified by the NOAA Harvesting Systems Unit, a BRD must reduce finfish bycatch by at least 30% by weight.[5] NOAA Harvesting Systems Unit continues to research and certify new BRDs designs in an effort to continually improve bycatch reduction in the shrimp trawl fishery.[6] Furthermore, Amendment of the shrimp FMP also established a series of seasonal/area closures that can be implemented if an annual assessment of red snapper bycatch indicates that bycatch in the shrimp trawl fishery has exceeded its target limit.[7] TEDs are also required on all otter trawls and in skimmer trawls (exemption is allowed if maximum tow times are adhered to) to reduce the bycatch of sea turtles.[8] Research shows that TEDs also allow the escape of larger finfish species, such as sharks.[9] Maintaining TED compliance and effectiveness rates is an ongoing effort throughout the Gulf of Mexico shrimp fishery. Vessels harvesting shrimp within Gulf Exclusive Economic Zone (EEZ) by trawl may not exceed the recreational reef bag limits. Reef fish may not be sold when taken under a recreational permit/bag limit.[10] Bycatch data from the observer program between 2007 and 2010 indicated that 185 species were observed as incidental catch in the shrimp trawl fishery.[11] Analysis of these data found that the dominant species were Atlantic croaker, sea trout, and longspine porgy (approximately 26% of total catch weight). Other species identified were inshore lizardfish, mantis shrimp, portunid crabs, searobins and Gulf butterfish. An assessment of the dominant bycatch species by Raborn et al. (2014) found that	

	shrimp trawl activities did not pose a serious threat to the populations of any of the species analyzed.[12] **Texas:** Licensed shrimp boat captains in Texas may retain nongame finfish and other aquatic species within lawful limits for each species up to 50% in total weight of shrimp (by weight) on board .[13] The following game species are commercially protected and must be returned to the water: Bass of the genus *Micropterus*, striped bass (*Morone saxatilis)*, white bass (*Morone chrysops)*, yellow bass (*Morone mississippiensis)*, flathead catfish (*Pylodictis olivaris)*, black crappie (*Pomoxis migromaculatus)*, white crappie (*Pomoxis annularis)*, red drum *(Sciaenops ocellatus)*, goliath grouper (*Epinephelus itajara)*, blue marlin (*Makaira nigricans)*, white marlin (*Kajikia albidus)*, northern pike (*Esox lucius)*, sailfish (*Istiophorus albicans)*, sauger (*Sander canadensis)*, spotted seatrout (*Cynoscion nebulosus)*, snook (*Centropomus undecimalis)*, longbill spearfish (*Tetrapturus pflugeri)*, tarpon (*Megalops atlanticus)*, and walleye (*Sander vitreum)*. Texas requires the use of TED and BRDs in shrimp trawls under state law.[14] Limited-entry licenses and seasonal/area closures also serve to reduce effort and help to minimize bycatch.	

[1] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[2] Frank Helies and Judy Jamison (2009) "Reduction Rate, Species Composition, and Effort: Assessing Bycatch Within the Gulf of Mexico Shrimp Trawl Fishery." NOAA/NMFS Cooperative Agreement Number NA07NMF4330125 (#101) http://www.gulfsouthfoundation.org/uploads/reports/101_final4.pdf

[3] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[4] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[5] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[6] "Harvesting Systems Unit: Gear Development" NOAA Southeast Fisheries Science Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/fishinggear.htm

[7] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[8] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[9] Scott Raborn, Benny Gallaway, John Cole, William Gazey and Kate Andrews "Effects of Turtle Excluder Devices (TEDs) on the Bycatch of Three Small Coastal Sharks in the Gulf of Mexico Penaeid Shrimp Fishery" 2012. North American Journal of Fisheries Management 32:333-345 http://www.tandfonline.com/doi/abs/10.1080/02755947.2012.678962#preview

[10] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[11] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[12] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[13] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[14] 31 Tex. Admin. Code §58.160 https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

7.6.9(a)(ii) - catch of non-target species (both fish and non-fish species)?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	Several regulations have been designed to minimize catch of non-target species in the shrimp fishery. **<u>Federal</u>:** According to the U.S. Code of Federal Regulations, shrimp trawl vessels must have a certified bycatch reduction device (BRD) installed on each net for fishing on their vessel.[1] to be certified by the NOAA Harvesting Systems Unit, a BRD must reduce finfish bycatch by at least 30% by weight.[2] NOAA Harvesting Systems Unit continues to research and certify new BRDs designs in an effort to continually improve bycatch reduction in the shrimp trawl fishery.[3] Furthermore, Amendment of the shrimp FMP also established a series of seasonal/area closures that can be implemented if an annual assessment of red snapper bycatch indicates that bycatch in the shrimp trawl fishery has exceeded its target limit.[4] TEDs are also required on all otter trawls and in skimmer trawls (exemption is allowed if maximum tow times are adhered to) to reduce the bycatch of sea turtles.[5] See below response to 7.6.9(a)(iii) for full details on TED use, effectiveness and compliance. Bycatch data from the Observer Program between 2007 and 2010 indicated that 185 species were observed as incidental catch in the shrimp trawl fishery.[6] Analysis of these data found that the dominant species were Atlantic croaker, sea trout, and longspine porgy (approximately 26% of total catch weight). Other species identified were inshore lizardfish, mantis shrimp, portunid crabs, searobins and Gulf butterfish. An assessment of the dominant bycatch species by Raborn et al. (2014) found that	

shrimp trawl activities did not pose a serious threat to the populations of any of the species analyzed.[7]

Red snapper (*Lutjanus campechanus)*

Red snapper bycatch has also been a significant concern in the Gulf of Mexico shrimp fishery because the red snapper fishery in the Gulf of Mexico is considered overfished and is in a rebuilding plan.[8] This rebuilding plan includes a significant reduction in juvenile red snapper bycatch in the Gulf of Mexico shrimp fishery. Amendment 9 of the Shrimp FMP deals directly with the reduction of red snapper bycatch.[9] The goal of Amendment 9 was to reduce bycatch of juvenile red snapper in age 0 and age 1 groups by 50%, which was the amount determined by NOAA Fisheries as necessary for the rebuilding plan. Amendment 9 required the use of BRDs in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ. East of Cape San Blas was exempt at the time due to low abundance of red snapper in this area, and state waters were not considered a factor because it was determined that juvenile red snapper typically occur beyond depths of 5 fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms).[10] BRD devices are certified by NOAA Fisheries and BRDs are required in all shrimp trawls except royal red trawls and try nets (nets smaller than 12 ft).[11,12] The implementation of BRD regulations in 1998, and the requirement of TEDs, which also allow for the release of some finfish bycatch, along with the closure seasons/areas in place, and reduction in shrimp effort since the 1990s have all contributed to significant reductions in juvenile red snapper bycatch. In 2007, Amendment 14 (effective in 2008) established a new red snapper bycatch reduction target for the shrimp fishery and designated seasonal closure restrictions that could be used to manage shrimp fishing effort in relation to the target bycatch reduction goal.[13] The seasonal closure area were designated within the statistical zones 10-21 between 10-30 fathoms and designed to start in conjunction with the annual Texas Closure, if needed. The need for the closure, and its duration and extent is determined annually by an SEFSC assessment of the previous year's shrimp effort within the designated zone, and associated red snapper mortality. If it is determined that a seasonal closure is necessary, then the Regional Administrator will set the closed season area and duration as necessary to meet the bycatch reduction target.

Bycatch reduction target for juvenile red snapper in the shrimp fishery have been meet and exceeded through use of BRDs and significant reductions in shrimp effort.[14]

Some stakeholders have also raised concern over other commercially and recreationally important species, such as blacknose shark (*Carcharhinus acronotus*). In 2007, NOAA Fisheries determined that blacknose shark was overfished and experiencing overfishing, and bycatch and associated mortality from the shrimp trawl fishery was considered a factor in the decline of the species.[15] Since this time, the blacknose shark population has been divided into two separate populations- an Atlantic population and a Gulf of Mexico population.[16] The Atlantic population remains listed as overfished and overfishing; however, the Gulf of Mexico stock is currently considered unknown based on the 2011 NOAA Fisheries stock assessment.[17] Raborn et al. (2012) determine that implementation of TEDs was effective in mitigating bycatch of blacknose sharks in the gulf of Mexico shrimp

	fishery since sharks are also capable of escaping trawls through TEDs.[18] **Texas:** Texas requires the use of TED and BRDs in shrimp trawls under state law.[19] Limited-entry licenses and seasonal/area closures also serve to reduce effort and help to minimize bycatch.	

[1] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[2] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[3] "Harvesting Systems Unit: Gear Development" NOAA Southeast Fisheries Science Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/fishinggear.htm

[4] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[5] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[6] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[7] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[8] "Red Snapper" *Fishwatch*. Web. Accessed June 2015. http://www.fishwatch.gov/seafood_profiles/species/snapper/species_pages/red_snapper.htm

[9] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[10] Nichols, Scott. *The spatial and temporal distribution of the bycatch of red snapper by the shrimp fishery in the offshore waters of the US Gulf of Mexico*. Pascagoula, Mississippi: National Marine Fisheries Service, Mississippi Laboratories, 1990.

[11] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[12] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[13] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[14] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[15] SEDAR 13. "Stock Assessment Report- Small Coastal Shark Complex, Atlantic Sharpnose, Blacknose, Bonnethead, and Finetooth Shark" Southeast Data, Assessment, and Review. 2007. http://www.nmfs.noaa.gov/sfa/hms/species/sharks/documents/shark_stock_assessment_report_11-14-07.pdf

[16] SEDAR 21. "HMS Gulf of Mexico Blacknose Shark Stock Assessment Summary report" Southeast Data, Assessment, and Review. 2011. http://www.nmfs.noaa.gov/sfa/hms/species/sharks/documents/gulf_of_mexico_blacknose_shark_assessment_summary_final.pdf

[17] NOAA Fisheries. *Status of Stocks 2014, Annual Report to Congress on the status of U.S. Fisheries.* http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2014/2014_status_of_stocks_final_web.pdf

[18] Scott Raborn, Benny Gallaway, John Cole, William Gazey and Kate Andrews "Effects of Turtle Excluder Devices (TEDs) on the Bycatch of Three Small Coastal Sharks in the Gulf of Mexico Penaeid Shrimp Fishery" 2012. North American Journal of Fisheries Management 32:333-345 http://www.tandfonline.com/doi/abs/10.1080/02755947.2012.678962#preview

[19] 31 Tex. Admin. Code §58.160 https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

7.6.9(a)(iii) - impacts on associated, dependent or endangered species?
Yes...[1] **Some...** [½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	National Standard 9 of the MSA requires that "conservation and management measures shall, to the extent practicable: (1) minimize bycatch; and (2) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."[1] The GMFMC shrimp FMP contains two goals/objectives that directly address this mandate of the MSA:[2] - Objective 4: "Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act." - Objective 5: "Minimize the incidental capture of finfish by shrimpers, when appropriate." **<u>Endangered Species Bycatch:</u>** One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the Endangered Species Act (ESA), which includes five species of sea turtles (Hawksbill, green, Kemp's Ridley, leatherback, and loggerhead), smalltooth sawfish, and Gulf sturgeon (a subspecies of Atlantic sturgeon). As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. NOAA Office of Protected Species provides detailed information on each species on their website, with each species site containing details on species status, description, habitat, distribution, population trends, threats, regulatory history and conservation efforts.[3] Section 7(a)(2) of the ESA requires each federal agency to ensure that any action they authorize is not likely to jeopardize the continued existence of any endangered or	

threatened species or result in the destruction or adverse modification of critical habitat of any listed species. In 2014 and update Biological Opinion was done, under the Section 7(a)(2) requirements, for the continued implementation of sea turtle conservation measures applicable to shrimp trawling and the continued authorization of the Southeast shrimp fisheries.[4] The opinion provides information on interactions with any threatened or endangered species, states the amount of incidental of listed species that may occur, specifies reasonable or prudent measures that are required to minimize impacts, requires monitoring of effects, and recommends conservation measures to further conserve listed species. The biological opinion was based on the best available scientific data and considered uncertainties within the evaluation process. The 2014 biological opinion made recommendations for measures to minimize impacts of incidental take to sea turtles and smalltooth sawfish, and concluded that continued authorization of the Southeast shrimp fisheries in federal waters is not likely to jeopardize the continued existence of threatened or endangered species.

Sea Turtles:
Turtle exclusion devices (TEDs) are required on all shrimp trawls (exemptions are allowed for certain trawl types if maximum tow times are adhered to) in state and federal waters to reduce the bycatch of sea turtles.[5] NRC (1990) determined that shrimp trawl bycatch was one of the most significant sources of mortality causing declines in sea turtle populations. Federal legislation went into effect requiring widespread use of TEDs in shrimp trawls in 1989 and by 1990 most shrimp trawls were equipped with TEDs. In 1993 a modification was made to allow for increased escape of leatherback turtles and in 2003, and additional modification in regulations to require larger opening further increased escape rates for larger loggerheads and leatherbacks. The 2003 regulation change was expected to reduce mortality of loggerheads by 94% and leatherbacks by 97%. Certified TED designs are required to meet a minimum efficiency threshold of 97% escapement of turtles within a five minute time period. TEDs have been very effective at reducing sea turtle shrimp trawl mortality as summarized by Finkbeiner et al. (2011):[6]

Species	Mortality	
Atlantic/Gulf	Pre-regulation	Post-Regulation
Lepidochelys kempii	4,300	2,700
Caretta caretta	63,500	1,400
Chelonia mydas	500	300
Dermochelys coriacea	2,300	40
Eretmochelys imbricata	20	<10
	70,620	4,450

Post-TED mortality estimates are about 94% lower, (4,450 total deaths) than pre-regulation estimates (70,620).

TED compliance is currently enforced by NOAA Fisheries enforcement agents, USCG, and each of the five state agency enforcement officers. The 2012 and 2014 biological opinions require an 88% effectiveness rate for TEDs in the Gulf and South Atlantic shrimp trawl fisheries.[7] This rate is calculated using NOAA enforcement and

inspection rates and violations are ranked from Level 1 through level 4 based on severity of violation and likelihood that the offense would lead to a higher turtle capture rate.[8] These compliance data are entered into a matrix to determine the overall effectiveness rate of TEDs in the shrimp trawl fleet on a quarterly basis. NOAA enforcement/inspection data are currently the only source of information on TED compliance used to determine effectiveness for the Gulf shrimp fleet. Though TED enforcement and inspections are conducted by the USCG and each state agency, these data are not made public and not included in NOAA's calculations. Many stakeholders believe that measuring TED compliance using only enforcement data biases the calculation negatively because enforcement is not random, rather, enforcement agents tend to target vessels that are more likely to be out of compliance. This leads to higher reporting of offenses and a lack of documentation of vessels that are in compliance. In 2015, representatives from each of the enforcement agencies met to further discuss inconsistencies in inspection methods and concerns over methods used to determine TED compliance.[9] State and federal agencies continue to discuss possible solutions to these concerns. NOAA enforcement and inspection rates for the shrimp fishery are low due to a limited number of enforcement agents and few members of the NOAA Gear Monitoring Team (GMT) capable of conducting inspections. In 2015, the federal fishery has over 1300 permits and the number of state licenses range from 300-1000+ permits. NOAA inspections cover only about 200 vessels per year.[10]

TED compliance and effectiveness rates are a continuing concern for the fishery due to the problems mentioned above and because compliance rates have fluctuated around the minimum compliance rate for the past several years. From March to November 2011, the TED compliance rate was as low as 66%, with an effectiveness rate ranging between 83-85%.[11] Since 2011, education, outreach, and increased courtesy inspections by NOAA GMT and Sea Grant have helped to increase compliance ratings and NOAA now posts compliance numbers quarterly on their website.[12] In 2015, overall effectiveness rates remained above 88% for every month, except April (85.15%) with an average overall effectiveness of 93.34%.[13]

Additionally, NOAA, state agencies and shrimp industry members (including the Texas Shrimp Association) have contributed to efforts protecting sea turtle nesting beaches in Mexico and areas throughout the Gulf coast to assist in the recovery of sea turtle populations. NOAA SEFSC Galveston Lab participates in 1) Captive Rearing Program, which provides opportunities to research numerous aspects of sea turtles, 2) Gear Research Program, and 3) the Sea Turtle Stranding and Salvage Program.[14]

<u>Smalltooth sawfish</u>

The Recovery Plan for smalltooth sawfish cites bycatch in other fisheries as a primary reason for the decline of this species.[15] Previous documentation of landings as incidental catch in the shrimp fishery were reported between 1940s-1980s in Louisiana and Texas; however, there has been minimum documentation of recent landings and informal interviews by port agents indicate that recent interactions are rare. The population of smalltooh sawfish is thought to have declined by as much as 95% and the geographical range of the species is likely significantly diminished.

Currently, three National Wildlife Refuges in Florida provide habitat protection for known reproducing populations of smalltooth sawfish, catch or harm of smalltooth sawfish is illegal, and guidelines have been published on the handling and release of smalltooth sawfish that are incidentally caught in commercial and recreational fisheries. The recovery Plan estimates for one smalltooth sawfish taken in the shrimp trawl fishery per year. It is possible that the implementation of TEDs and BRDs in the shrimp fishery would allow for smalltooth sawfish escape should interactions with shrimp trawls occur. There is still some question; however, as to whether trawl bycatch might impact recovery if/when this species population begins to rebuild and potential interactions increase.

Gulf Sturgeon

The most recent 5-year review (2009) for the Recovery Plan for Gulf Sturgeon notes that bycatch in shrimp trawls has been infrequently documented in past and that implementation of TED and BRD regulations has likely mitigated bycatch impacts to this species.[16] No regulatory actions are required directly in relation to bycatch of Gulf sturgeon for the shrimp fishery.

MARINE MAMMALS:

The Marine Mammal Protection Act (MMPA) 1994 revision includes changes of regulation regarding the incidental take of marine mammals in commercial fishing operations, requiring a goal to reduce serious injury and mortality of marine mammals to "insignificant levels", approaching a zero mortality rate.[17] "Insignificant Level" is defined as less than 10% of the potential biological removal (PBR). NOAA's Office of Protected Species evaluates fisheries based on their potential interaction with marine mammals during fishing operations and places fisheries into three categories: Cat. 1- high interaction, Cat. 2- med-low interaction, and Cat. 3- little or no known interactions.[18] The Gulf of Mexico shrimp fishery is currently listed as a Category 2 fishery on the List of Fisheries.[19] This determination was based on potential interactions with bottlenose dolphins. Lack of a calculated PBR for the Gulf of Mexico bottlenose dolphin populations, data from stranding programs, and low observer coverage in the fishery are all reasoned that prompted NOAA to assign a Cat. 2 ranking. Cat. 2 designation requires that each fishery participant be registered with the Office of Protected species and carry an authorization certificate. Typically, registration with the Marine Mammal Authorization Program is combined with state and federal permitting systems and all fishermen receiving permits are registered with the Office of Protected Species automatically. Cat. 2 requirements also require the fishery to have an observer program and fishermen must carry an observer onboard if requested, and must comply with any take reduction plans in place. There is currently no take reduction plan in the Gulf of Mexico for bottlenose dolphins. Fishermen are also required to report all incidental injuries and mortalities of marine mammals to the Office of Protected Species.

[1] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[2] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[3] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[4] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[5] 50 CFR § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[6] Elena M. Finkbeiner, Bryan P. Wallace, Jeffrey E. Moore, Rebecca L. Lewison, Larry B. Crowder, and Andrew J. Read, "Cumulative estimates of sea turtle bycatch and mortality in USA fisheries between 1990 and 2007" Biological Conservation 144 (2011) 2719–2727 http://micheli.stanford.edu/pdf/Cumulative%20estimates%20of%20sea%20turtle%20bycatch%20and%20mortality%20in%20U.S.A.%20fisheries%20between%201990-2007.pdf

[7] NMFS. 2014.

[8] NOAA Fisheries. "Penalty Matrix for Endangered Species Act" *NOAA Policy for Assessment of Penalties and Permit Sanctions*. March 2011. http://www.shrimpalliance.com/new//wp-content/uploads/2012/03/2pagesfromPenaltyPolicy.pdf

[9] Gulf and South Atlantic Fisheries Foundation, "Gulf and South Atlantic News, Volume 16, Issue 1" May 2014 http://gulfsouth.ehclients.com/uploads/newsletters/5_15newsletter_short.pdf

[10] NOAA Fisheries. *Turtle Excluder Device (TED) Compliance Policy*. Draft May 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/ted_compliance_policy.pdf

[11] NMFS. 2014.

[12] "TED compliance" NOAA Fisheries. Web. Accessed June 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/index.html

[13] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/0216_southeastern_shrimp_otter_ted_inspections__compliance__sea_turtle_capture_rates__and_ted_effectiveness_april_2014-december_2015.pdf

[14] "Sea turtles" *NOAA Galveston Laboratory.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/seaturtles/index.html

[15] National Marine Fishery Service (NMFS). 2010. *Smalltooth Sawfish 5-Year Review: Summary and Evaluation.* http://www.nmfs.noaa.gov/pr/pdfs/species/smalltoothsawfish_5yearreview.pdf

[16] USFWS and NMFS. 2009. *Gulf Sturgeon (Acipenser oxyrinchus desotoi) 5-Year Review*. http://www.nmfs.noaa.gov/pr/pdfs/species/gulfsturgeon_5yearreview.pdf

[17] "Marine Mammal Protection Act" *NOAA Fisheries*. Web. Accessed August 2015. http://www.nmfs.noaa.gov/pr/laws/mmpa/

[18] "List of Fisheries" *NOAA Fisheries Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/interactions/lof/#report

[19] NOAA Office of Protected Species. "U.S. Atlantic, Gulf of Mexico Shrimp Trawl Fishery" http://www.nmfs.noaa.gov/pr/pdfs/fisheries/lof2012/southeastern_us_atlantic_gulf_shrimp_trawl.pdf

7.6.9 (b) Are technical measures being taken in relation to:

(i) - fish size? **Yes... [1] No...[0]**

Extent of compliance	
Yes	**No**
Federal: White shrimp harvested in Gulf waters are subject to size requirements of the state of Louisiana when possessed within Louisiana waters and landed in Louisiana ports. According to the U.S. Code of Federal Regulations (CFR), shrimp not in compliance with applicable size limits may not be possessed, sold, or purchased and must be released immediately. The CFR holds the operator of the vessel fishing in the Gulf Exclusive Economic Zone (EEZ) responsible for compliance of the size limits specified.[1] **Texas:** According to the Texas Administrative Code, it is illegal to possess shrimp smaller than legal size.[2] The Texas Parks & Wildlife Department (TPWD) sample for shrimp in the state waters throughout the year. This sampling helps TPWD's fisheries scientists determine the exact date for the opening of the shrimp season each year, along with when it is necessary to close the fishery. TPWD trawls throughout Texas coastal waters to find juvenile and adult shrimp. The shrimp season opening date can be determined when the majority of the shrimp are of legal size. Sampling also helps preserve the shrimp fishery as well. Samples taken by TPWD's Coastal Fisheries Division in April 2015 (along with other data collected regarding catch rates, lengths of shrimp, and percent of samples containing shrimp), indicate that a closing of the shrimp fishery is necessary. According to TPWD fishery scientists, shrimp must reach about 3 ½ inches in length before migrating to the Gulf. Closures allow shrimp to grow to a larger, more valuable size. The National Marine Fisheries Service (NMFS) assists in protecting smaller shrimp in federal waters by implementing season closures in coordination with TPWD.[3]	

[1] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[2] "Fishing Violations" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/warden/fishing

[3] "News Release: May 6, 2015" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150506a

7.6.9 (b)(ii) - mesh size or gear? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance	
Yes	**No**
Federal: According to the U.S. Code of Federal Regulations, explosives, chemicals and plants, fish	

traps, bottom trawls without a weak link in the tickler chain, and use of Gulf reef fish as bait are all prohibited in the EEZ.[1] In the Gulf EEZ, traps may not be used to fish for royal red shrimp.[2] Allowable gear for the Gulf of Mexico shrimp fleet are otter trawl, butterfly net, skimmer trawl, and cast net.[3] Shrimp trawls in the EEZ are required to have weak links in the tickler chain and must be equipped with a certified BRD.[4] All shrimp otter trawls in state and federal waters are required to be equipped with a certified- TED.[5] **Texas:** Texas Parks & Wildlife Department (TPWD) imposes gear size restrictions to control harvests and prevent habitat damage. It is unlawful to possess trawls that are larger than legal width or have small mesh in an area where it is restricted. Gear used to catch fish or other aquatic products (including shrimp) are not allowed in public waters where the gear is prohibited. TPWD outlines specific requirements for different types of nets used in the harvesting of shrimp and other aquatic species. Net Type I, Net Type II, Seabob Net, and trawls (otter and beam) have specific door length, total width, and other size requirements for doors and total widths.[6] A bait shrimp trawl tag is required to bait shrimp in Texas waters. Gear for bait shrimp trawls must not be greater than 20 feet in width between the doors. It is unlawful for mesh size to be smaller than 8-3/4 inches over a series of five stretched meshes. Boards are limited to 450 square inches each.[7] A fishing license and a saltwater fishing stamp endorsement is required for recreational harvest in Texas waters. Cast nets used by recreational harvesters must not be greater than 14 feet in diameter. Seine nets (including push nets) must not be longer than 20 feet or have mesh exceeding ½ inch square. Seine nets used recreationally must be manually operated.[8]	

[1] 50 C.F.R. § 622.9 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_19

[2] 50 C.F.R. § 622.54 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_154

[3] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[4] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#_top

[5] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[6] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[7] "Shrimp Regulations & Restrictions" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/regulations/outdoor-annual/fishing/shellfish-regulations/shrimp-regulations

[8] *"Fishing Rules and Regulations" Outdoor Annual, Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/

7.6.9 (b)(iii) - discards? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance	
Yes	**No**
Federal: According to the U.S. Code of Federal Regulations, shrimp trawl vessels must have a BRD installed on each net for fishing on their vessel.[1] TEDs are also required on all otter trawls.[2] Vessels harvesting shrimp within Gulf Exclusive Economic Zone (EEZ) by trawl may not exceed the recreational reef bag limits. Reef fish may not be sold when taken under a recreational permit/bag limit.[3] These regulations were designed to minimize discards in the fishery. **Texas:** Licensed shrimp trawlers may retain nongame fish and other aquatic products taken incidental to legal shrimp trawling operations, as long as each person retains a lawful limit of fish and has a shrimp boat captains' license or is the owner of the shrimp boat. For the taking of nongame fish and other aquatic products, the total weight of aquatic products must not exceed 50% by weight of the shrimp aboard. From May 1 through September 30, only up to 1500 live nongame fish not regulated by bag or size limit and/or 300 dozen ribbonfish may be retained daily for bait purposes only on board a vessel licensed for commercial bait shrimp harvesting. Taking of any aquatic product of illegal size is not unlawful if returned to waters in a manner that ensures their best chance of survival.[4] These TPWD regulations are in place for discards of target species. Commercial fishermen may retain other non-target species as long as they are taken legally within the recreational bag, possession and size limits. Certain game fish are considered commercially protected finfish and must be returned to the water immediately if caught. Commercially protected finfish include[5]: - Bass of the genus *Micropterus*, striped bass (*Morone saxatilis)*, white bass (*Morone chrysops)*, yellow bass (*Morone mississippiensis)*, flathead catfish (*Pylodictis olivaris)*, black crappie (*Pomoxis migromaculatus)*, white crappie (*Pomoxis annularis)*, red drum *(Sciaenops ocellatus)*, goliath grouper (*Epinephelus itajara)*, blue marlin (*Makaira nigricans)*, white marlin (*Kajikia albidus)*, northern pike (*Esox lucius)*, sailfish (*Istiophorus albicans)*, sauger (*Sander canadensis)*, spotted seatrout (*Cynoscion nebulosus)*, snook (*Centropomus undecimalis)*, longbill spearfish (*Tetrapturus pflugeri)*, tarpon (*Megalops atlanticus)*, and walleye (*Sander vitreum)*.	

[1] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[2] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[3] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] "Shellfish Regulations" Texas Parks and Wildlife Department. Web. Accessed June 2015. http://www.tpwd.state.tx.us/regulations/outdoor-annual/fishing/shellfish-regulations/

7.6.9 (b)(iv) - closed seasons? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance	
Yes	**No**
Federal: According to the U.S. Code of Federal Regulations, there are numerous closed areas at varying times throughout the Gulf Exclusive Economic Zone (EEZ). Shrimp sanctuaries are also in place in Gulf waters (which prohibit shrimping within their boundaries) to protect marine resources. Each year, a seasonal area closure for the shrimp fishery may be established to reduce juvenile red snapper mortality based on the framework procedure in the Gulf shrimp FMP. Determining the need for closures and the geographical extent and duration is based on an annual assessment (from the Southeast Fisheries Science Center) of shrimp effort and shrimp trawl bycatch mortality.[1] NOAA Fisheries closes federal waters to shrimping off the coast of Texas from approximately mid-May to mid-July (based on sampling conducted by the Texas Parks and Wildlife Department). Federal waters open to shrimp fishing when Texas opens state waters.[2] **Texas:** The Texas Parks & Wildlife Department (TPWD) Coastal Fisheries Division determines the opening of the shrimp fishery based on the size of the shrimp. Closing dates may be adjusted providing 72 hours' notice to the public for new closing dates and 24 hours' notice for new opening dates. Federal and state waters have designated closed seasons that are allowed to be changed when deemed necessary.[3] Information regarding annual life cycles, growth rates, and abundance are also incorporated into the decision. To protect small shrimp and allow them to grow to a more valuable size, nursery areas are closed to shrimping. The area within five nautical miles of the southern Texas coast is closed annually (December 1 - July 15) for protection of juveniles and spawning shrimp. This closing helps sustain the reproductive success of adult shrimp and the shrimp industry.[4]	

[1] 50 C.F.R. § 622.55 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_155

[2] *FishWatch*. Web. Accessed November 2015. http://www.fishwatch.gov/seafood_profiles/species/shrimp/species_pages/brown_shrimp.htm

[3] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[4] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=99

7.6.9 (b)(v) - closed areas? ***Yes...***[1] ***No...***[0]

Extent of compliance	
Yes	**No**
Federal: Each year, a seasonal area closure for the shrimp fishery may be established based on the framework procedure in the Gulf Shrimp Fisheries Management Plan (FMP). The need for closures and the geographical scope and duration is based on an annual assessment conducted by the Southeast Fisheries Science Center shrimp effort and shrimp trawl bycatch mortality.[1]	

Due to fishing complications with the stone crab industry, five zones have been established in the Gulf EEZ to separate shrimp trawling and stone crab trapping.[2] Shrimp sanctuaries are also in place in Gulf waters (which prohibit shrimping within their boundaries) to protect marine resources.[3] **Texas:** Shrimping is not permitted in any area that may be a pass leading from inside waters (bodies of water landward of the shoreline) to outside waters (the part of the Gulf extending from the shore seaward nine nautical miles) of the state. It is unlawful for a person to take or attempt to take shrimp in specific areas in Laguna Madre. Federal waters are closed to shrimping from May 15 - July 15 for the closed summer season. It is illegal to harvest shrimp within five nautical miles of the Texas coast from Dec. 1 – Feb. 15. The South Zone Texas coast is closed within five nautical miles from Feb. 16 - May 15. From May 15 - July 15, shrimping is closed within nine nautical miles off the Texas coast.[4] There are currently three locations in Texas with retention bans on finfish and shellfish by order of the Texas Department of State Health Services due to contaminants which include a portion of Lavaca Bay, Echo Lake in Tarrant County and the Donna Irrigation System in Hidalgo County.[5] Similar to the answer above, shrimp nursery grounds are closed to ensure the sustainability of the shrimp industry. Closing the nursery grounds allows for small shrimp to grow to a more valuable size while also allowing for the reproductive success of the shrimp industry (see "closed seasons" above).[6]	

[1] 50 C.F.R. § 622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] 50 C.F.R. § 622.55 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_155

[3] 50 C.F.R. § 622.55 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_155

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[6] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=99

7.6.9 (b)(vi) - areas reserved for particular (e.g. artisanal) fisheries? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance	
Yes	**No**
Federal: There are no designated areas within federal waters designed for a specific user group for shrimp. Recreational and live-bait shrimping are regulated within various state waters in the	

Gulf; however, these activities do not typically occur in federal waters due to distance from shore. **Texas:** Live bait shrimping is allowed with certain restrictions in Texas waters. A bait shrimp trawl tag is required to bait shrimp in Texas waters. Licenses for this fishery are limited.[1] Gear for individual bait shrimp trawls must not be greater than 20 feet in width between the doors. It is unlawful for mesh size to be smaller than 8-3/4 inches over a series of five stretched meshes for individual bait shrimp trawls. Boards are limited to 450 square inches each.[2] Commercially, a vessel displaying a bait shrimp license must operate as a commercial bait shrimp harvester and follow commercial bait shrimp regulations. There is a 200 pound daily limit which must contain 50% of live shrimp (if licensed as both a bay shrimp boat and a bait shrimp boat, 800 pound maximum of head-on shrimp per calendar day from May 15 - July 15). This is only allowed in designated areas authorized for bait shrimping, sales or unloading to a bait shrimp dealer or sportsman. Bait shrimping otter trawls are restricted to 12 feet total width with a maximum door size of 450 square inches. Beam trawls may not exceed five feet width.[3]	

[1] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[2] "Shrimp Regulations & Restrictions" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://tpwd.texas.gov/regulations/outdoor-annual/fishing/shellfish-regulations/shrimp-regulations

[3] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

7.6.9 (b)(vii) - protection of juveniles or spawners? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance	
Yes	**No**
Federal: Due to high reproductive rates and short life cycles, shrimp stocks are highly resilient to fishing pressures, and management focus is largely on economic improvements and minimizing bycatch, rather than abundance. Therefore, the goal of shrimp size restrictions, while protecting juveniles, is meant to maximize the harvest (while minimizing its environmental impact). Seasons are set according to samples providing information on life cycle and abundance to ensure the shrimp harvested are a marketable size and that enough mature shrimp survive to reproduce and sustain the fishery.[1] According to the U.S. Code of Federal Regulations (CFR), shrimp not in compliance with applicable size limits may not be possessed, sold, or purchased and must be released immediately. The U.S. CFR holds the operator of the vessel fishing in the Gulf EEZ responsible for compliance of the size limit regulations.[2] **Texas:** According to the Texas Administrative Code, it is illegal to possess shrimp smaller than legal size.[3] The Texas Parks & Wildlife Department (TPWD) sample for shrimp in state waters	

throughout the year. This sampling helps TPWD's fisheries scientists determine the exact date for the opening of the shrimp season each year, along with when it is necessary to close the fishery. Information regarding annual life cycles, growth rates, and abundance are also incorporated into the decision. TPWD trawls throughout Texas coastal waters to find juvenile and adult shrimp. The shrimp season opening date can be determined when the majority of the shrimp are of legal size, helping to ensure that shrimp are mature enough to reproduce and sustain the fishery.[4] Sampling also helps preserve the shrimp fishery. Samples taken by TPWD's Coastal Fisheries Division in April 2015 (along with other data collected regarding catch rates, lengths of shrimp, and percent of samples containing shrimp), indicate that a closing of the shrimp fishery is necessary. According to TPWD fishery scientists, shrimp must reach about 3 ½ inches in length before migrating to the Gulf. Closures allow shrimp to grow to a larger, more valuable size. The National Marine Fisheries Service (NMFS) assists in protecting smaller shrimp in federal waters by implementing season closures in coordination with TPWD.[5] To protect small shrimp and allow them to grow to a more valuable size, nursery areas are closed to shrimping. The area within five nautical miles of the southern Texas coast is closed annually (December 1- July 15) for protection of juveniles and spawning shrimp. This closing helps sustain the reproductive success of adult shrimp and the shrimp industry.[6]	

[1] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=99

[2] 50 C.F.R. § 622.56 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_156

[3] "Fishing Violations" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/warden/fishing

[4] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=99

[5] "News Release: May 6, 2015" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/newsmedia/releases/?req=20150506a

[6] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=99

7.6.9 (c) Are suitable arrangements in place to promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear and techniques?
Yes...[1] Some... [½] No...[0]

Extent of compliance		
Yes	**Some**	**No**
The primary gear type in the Texas commercial shrimp fishery is the otter trawls,.[1,2] Fishermen and managers in the Gulf Of Mexico work collaboratively on innovative gear modifications to reduce impacts. TEDs are required in otter trawls in state and federal waters by federal regulations, and tow time limits are required for skimmer trawls and butterfly nets.[3] The use of BRDs is required in federal waters and encouraged in state waters, but not required.[4] Substantial improvements have been made in reducing impacts of shrimp fishing, however, the Gulf of Mexico shrimp		

fishery still has one of the highest bycatch ratios among U.S. Fisheries.[5] Continuing efforts to improve gear designs are ongoing. For specific details on gear selectivity of the Texas shrimp trawl fishery, refer to 7.2.2 (g)(iii) response.		

[1] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[2] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[3] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[4] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[5] National Marine Fisheries Service. 2013. *U.S. National Bycatch Report First Edition Update 1* [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. http://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

7.6.10 Have measures been introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery of such stocks?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Gulf of Mexico shrimp fishery is managed by the GMFMC and NOAA Fisheries under the principles of the MSA. The GMFMC shrimp FMP is in compliance with MSA mandates to prevent overfishing and overfished conditions.[1] The GMFMC originally established an overfishing and overfished levels for each of the penaeid species in Amendment 13 of the Shrimp FMP.[2] NOAA Fisheries has monitored the parent stock levels for all three shrimp species since 1970. Parent stock levels for these species have remained above the established thresholds throughout the monitoring period and all three stocks are not considered overfished or undergoing overfishing. Recent changes in the model used for annual stock assessments for the Gulf of Mexico penaeid shrimp species now produce different outputs and in 2015 GMFMC updated the SDC for penaeid shrimp to fit with this new model.[3] The new reference points are: **MSY** - Brown shrimp: MSY is 146,923,100 pounds of tails - White shrimp: MSY is 89,436,907 pounds of tails **Overfishing** The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the fishing mortality rate at MSY (F_{MSY}). - Brown shrimp: F_{MSY} = 9.12 - White shrimp: F_{MSY} = 3.48		

Overfished

The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}).

- Brown shrimp: SSB_{MSY} is 6,098,824 pounds of tails
- White shrimp: SSB_{MSY} is 365,715,146 pounds of tails

These values will be updated every 5 years through the framework procedure, unless changed earlier by the GMFMC.

Amendment 15 also updated actions to be taken should reference points be exceeded as follows:

- "Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT 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."

NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the Gulf of Mexico shrimp fishery and produces the following reports: Closure analysis reports for the Texas and Tortugas closure areas, annual stock assessment reports, shrimp stock trend analysis reports, recruitment overfishing monitoring reports, growth overfishing analysis reports, shrimp effort estimation and analysis reports and yield per recruit (YPR) analysis reports.[4]

Penaeid shrimp in the Gulf of Mexico are exempt from requirements for ACLs and Accountability measures (AMs) because they have a life cycle of approximately one year. MSA Section 600.310(h)(2) states:[5]

> (2) *Exceptions from ACL and AM requirements*—(i) *Life cycle.*
> *Section 303(a)(15) of the Magnuson-Stevens Act ``shall not apply to a fishery for species that has a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species'' (as described in Magnuson-Stevens Act section 303 note). This exception applies to a stock for which the average length of time it takes for an individual to produce a reproductively active offspring is approximately 1 year and that the individual has only one breeding season in its lifetime. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule.*

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015.

http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

7.7 Implementation

7.7.1 Has an effective legal and administrative framework been established at the local and national level, as appropriate, for fishery resource conservation and management? ***Yes...***[1] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: GMFMC was established by the Fishery Conservation and Management Act of 1976 to create FMPs as a way to conserve Gulf fishery resources.[1] FMPs serve as a basis for the management of the fisheries of the Gulf's EEZ which begins at the outer limit of the states' jurisdictions and extends 200 nautical miles from the shore. FMPs include federal regulations (implemented by the Secretary of Commerce) that are enforced by the U.S. Coast Guard, agents from the National Marine Fisheries Service (NMFS), and the Gulf states.[2] NOAA Fisheries is responsible for managing the nation's oceanic resources using the Magnuson-Stevens Act and partnering with regional fishery management councils (GMFMC for the Gulf of Mexico) to:[3] • Conduct fish stock assessments • Set catch limits • Ensure compliance with fishery regulations • Reduce bycatch NOAA Fisheries, also known as (and referred to above as) NMFS, is an office of the National Oceanic and Atmospheric Administration within the Dept. of Commerce. It has five regional offices, six science centers, and over 20 laboratories. **Gulf States:** GSMFC was established in 1949 by an act of Congress as a compact of all five Gulf States with the purpose of promoting better utilization of fisheries of the Gulf of Mexico.[4] GSMFC is composed of members from each of the five states. GSMFC does not hold regulatory authority, but is empowered to make recommendations to the legislatures of the five states. Their recommendations are based on scientific studies carried out with state and federal agencies on regional concerns and GSMFC acts as a forum to discuss management practices and fishery concerns of regional importance. **Texas:** The Texas shrimp fishery was managed directly by the Texas legislature until the 1980s.[5] The Wildlife Conservation Act of 1983 charges TPWC with responsibility for management of marine fisheries and gives authority to promulgate regulations, and determines TPWD as its administrative department.[6] Chapter 11 of Texas Parks		

and Wildlife Code establishes TPWC, Chapter 12 states TPWC's powers and duties.[7,8] Under the direction of TPWC, TPWD is responsible management of coastal fisheries and resources and enforcement of legislative and regulatory procedures. All regulations adopted by TPWC are added into Title 31 of the Texas Administrative Code, Chapter 57.[9] TPWD's Coastal Fisheries Division (CFD) is headed by a Division Director selected by the Executive Director of TPWD.[10] The CFD manages fishery resources in all Texas territorial waters from bays and estuaries out to nine nautical miles in the Gulf of Mexico. CFD management goals are directed toward "optimizing long term utilization and sustaining fisheries populations at levels necessary to ensure replenishable stocks."[11] CFD also focuses research and management on habitat restoration and freshwater inflows into bays and estuaries. TPWD maintains the LED responsible for enforcing regulations adopted by TPWC.[12]		

[1] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/about/index.php

[2] "Gulf Council FAQs" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/resources/education_faqs/education_council_faqs.php

[3] "Our Mission" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/aboutus/our_mission.html

[4] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[5] Terry Cody et al., *Texas Shrimp Fishery Management Plan* (TPWD Coastal Fisheries Branch, 1989).

[6] Tex. Parks & Wild. Code § 61 http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.61.htm

[7] Tex. Parks & Wild. Code § 11 http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.11.htm

[8] Tex. Parks & Wild. Code § 12 http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm

[9] 31 T.A.C. § 57 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=57&rl=972

[10] Vincent Guillory, Harriet Perry, and Steven VanderKooy, *The Blue Crab Fishery of the Gulf of Mexico, United States: A Regional Management Plan* Gulf States Marine Fisheries Commission (Ocean Springs, MS, 2001). http://www.gsmfc.org/publications/GSMFC%20Number%20096.pdf

[11] "Coastal Fisheries Division" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/business/about/divisions/coastal_fisheries/

[12] "Law Enforcement Division" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/business/about/divisions/law_enforcement/

7.7.2 (a) Are laws in place that provide for sanctions? ***Yes...***[1] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA Fisheries Law Enforcement enforces more than 35 federal statues, with		

most falling within five legislative acts. The Magnuson –Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act of 1972, Endangered Species Act of 1973, Lacey Act Amendments of 1981, and National Marine Sanctuaries Act are enforced by NOAA. Along with 30 other statues, these five legislative acts help sustain U.S. fisheries.[1] Each of these legislative acts contains information regarding sanctions for people and vessels that violate these laws in U.S. waters.[2,3,4,5,6] **Texas:** Texas Code explicitly states that "a person commits an offense if the person violates a rule… relating to possessing a license or stamp otherwise required… for catching aquatic life."[7] License violations are categorized as a Class C Parks & Wildlife misdemeanor. Texas Administrative Code states that a person in violation of regulations outlined in Title 5 Chapter 77 commits a Class C Parks & Wildlife misdemeanor, as well. Repeat offenders face more severe penalties. If convicted once within five years before the current violation trial date, the person is guilty of a Class B Parks & Wildlife misdemeanor. If convicted two or more times within five years, the person is guilty of a Class A Parks & Wildlife misdemeanor. The captain of a vessel shall be considered guilty of a violation as the captain is considered responsible for the vessel and crew.[8]		

[1] "Laws We Enforce" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/what_we_do/laws.html

[2] MSA §307 (Prohibited Acts) http://www.nmfs.noaa.gov/sfa/magact/mag3a.html#s307

[3] 16 U.S.C. 1377 §107 (Enforcement) http://www.nmfs.noaa.gov/pr/laws/mmpa/fulltext.htm#section107

[4] "Lacey Act Amendments of 1981" *U.S. Fish and Wildlife Service*. Web. Accessed November 2015. http://www.fws.gov/laws/lawsdigest/LACEY.HTML

[5] "Legislation" *NOAA National Marine Sanctuaries.* Web. Accessed November 2015. http://sanctuaries.noaa.gov/about/legislation/welcome.html

[6] ESA Section 11 (Penalties) http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section11.pdf

[7] Tex. Admin. Code title 2 Ch. 12 http://www.statutes.legis.state.tx.us/Docs/PW/pdf/PW.12.pdf

[8] Tex. Admin Code Title 5 Ch. 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

7.7.2 (b) Are these adequate in severity to be effective? ***Yes...***[1] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA's Office of General Council publishes all enforcement decisions and orders on a national level.[1] NOAA Fisheries OLE also produces Quarterly reports by region to report on enforcement activities, which includes details on violations issues under each federal act enforced by NOAA agents and reports activities of each of the JEAs for states within that region. The FY15 First Quarter Report reflects active		

monitoring of fisheries in the Southeast Division with 58 total incidents including 25 incidents reported in violation of the MSA, 4 incidents of the ESA, 10 incidents of the Marine Mammal Protection Act.[2] OLE also maintains a current listing of enforcement actions on its website, and an archived listing of enforcement news reporting OLE program activities.[3,4] The Annual Review of the United States Coast Guard's Mission Performance (2013) report provides details of USCG activities for each division, including marine living resources.[5] According to this report, USCG spent 93,004 resource hours on living marine resources activities and compliance rates with fishing regulations has remained above 97%. Additionally, the NOAA SERO publishes information specifically on TED compliance on its website at regular intervals because is a priority for federal enforcement in the Gulf.[6,7] The vast majority of the vessels inspected in 2014 were fully compliant, which indicates the successful nature of the governing regulations. In collecting data on capture and overall TED effective rates, NOAA Fisheries consistently evaluates the degrees of TED violation severity.[8] **Texas:** Shrimp violations are generally low. Penalties increase in severity for repeat offenders, and licenses can be suspended or revoked, which typically deters additional violations.[9]		

[1] "Enforcement Decisions and Orders" *NOAA Office of General Counsel.* Web. Accessed November 2015. http://www.gc.noaa.gov/enforce-office6.html#nao

[2] NOAA Fisheries. *Office of Law Enforcement FY15 First Quarter Enforcement Report*. July 2013. http://safmc.net/sites/default/files/Regulations/pdf/NOAAOLE_Q1_2015_PublicReport_Final.pdf

[3] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[4] "News Archive" *NOAA Fisheries Office of Law Enforcement.* Web. Accessed June 2015. http://www.nmfs.noaa.gov/ole/newsroom/08_news_archive.html

[5] Department of Homeland Security, Office of Inspector General. *The Annual Review of the United States Coast Guard's Mission Performance (2013)*. OIG-14-140. September 2014**.** https://www.oig.dhs.gov/assets/Mgmt/2014/OIG_14-140_Sep14.pdf

[6] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[7] "NOAA assesses civil penalties to shrimpers for alleged Turtle Excluder Device violations." *NOAA News.* National Oceanic and Atmospheric Administration. Web. Accessed November. 2015. http://www.noaanews.noaa.gov/stories2011/2011110311_ole_teds.html

[8] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[9] Tex. Admin Code Title 5 Ch. 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

7.7.2 (c) Do sanctions affect (refusal/withdrawal/suspension) authorization to fish in the event of non-compliance with conservation and management measures in force? ***Yes...***[1] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA Fisheries Office of Law Enforcement protects Gulf fisheries by enforcing federal regulations in the exclusive economic zone (EEZ).[1] Regarding permit sanctions, statutes provide NOAA with broad authority to suspend or revoke. While suspension and revocation are effective deterrents, NOAA acknowledges that such sanctions have financial consequences beyond the alleged violator. Given this potential negative impact, permit sanctions are only imposed in situations considered "moderate to major" in terms of significance of offence. Permit suspensions include 5-20 days, 20-60 days, 60-180 days, and 180 days to one year. Prior history of violations is considered when determining the appropriate suspension length. Permit revocation is allowed in extreme cases (16 U.S.C. § 1858(g)(i)) including where a permit is obtained fraudulently or where other penalties (fines or permit suspensions) do not address the seriousness of the offence. Permit revocation can only take place with approval of the NOAA General Counsel or Deputy General Counsel.[2] **Texas:** TPWD maintains the authority to suspend or revoke a commercial bay or bait shrimp boat license if the license holder (or other operator) of the licensed vessel is guilty of one or more offenses totaling three offenses for the licensed vessel. The suspension may be for[3]: *"(1) six months, if:* *(A) the date of each offense is within a 24-consecutive-month period beginning not earlier than September 1, 1995; and* *(B) the license holder has not previously had a commercial bay or bait shrimp boat license suspended under this section; or* *(2) 12 months, if the date of each offense is within a 24-consecutive-month period and the license holder has previously had a commercial bay or bait shrimp boat license suspended under this section.* *(b) Except as provided by Subsection (c), a license suspension under this section does not affect the license holder's eligibility to renew the license after the suspension expires.* *(c) The executive director, after notice and the opportunity for a hearing, may permanently revoke a commercial bay or bait shrimp boat license if:* *(1) the license holder has previously had a commercial bay or bait shrimp boat license suspended twice under this section;* *(2) the license holder or any other operator of the licensed vessel is convicted of one or more flagrant offenses totaling three flagrant offenses for the licensed vessel; and* *(3) the date of each offense is in a 24-consecutive-month period beginning not earlier than the date of the most recent previous suspension under this section.* *(d) For purposes of this section, a flagrant offense includes:* *(1) trawling in a nursery area in violation of this code or of a proclamation of the commission issued under this code;* *(2) shrimping longer than 30 minutes before or 30 minutes after legal shrimping hours prescribed*		

by this code or by a proclamation of the commission issued under this code; *(3) exceeding possession limits, in violation of this code or of a proclamation of the commission issued under this code, by 100 or more pounds;* *(4) exceeding legal net size, in violation of this code or of a proclamation of the commission issued under this code, by five feet or more; or* *(5) falsifying information required by this subchapter or a commission rule adopted under this subchapter for the issuance of a commercial bay or bait shrimp boat license.* *(e) The same flagrant offense may not be counted for more than one suspension under this section."*		

[1] "Law Enforcement FAQs" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/faqs.html

[2] NOAA Fisheries. "Penalty Matrix for Endangered Species Act" *NOAA Policy for Assessment of Penalties and Permit Sanctions*. March 2011. http://www.shrimpalliance.com/new//wp-content/uploads/2012/03/2pagesfromPenaltyPolicy.pdf

[3] Tex. Admin. Code Title 5 Ch. 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

7.7.3 Are there, where appropriate, in place:

(i) - monitoring control and surveillance schemes? **Yes...[1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
State and federal agencies have strong measures in place for monitoring, surveillance and control of fishery resources. Refer to 7.1.7(a) for full details on programs and activities for monitoring, control and surveillance of the Texas shrimp fishery.		

7.7.3 (ii) - observer programs? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	Amendment 13 of the shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition. These methods include the implementation of an electronic logbook program (ELM) for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition.[1] Due to the high costs of outfitting boats with observers, NOAA Fisheries determined that 1% coverage would be adequate to document information on bycatch composition in the fishery and these data could be combined with detailed effort data from ELBs to extrapolate total bycatch numbers for the fishery. Observer data goes into the SEDAR process and is utilized in models to determine bycatch of individual species, which is then used in assessments of those species. The most recent report published in 2012 indicates that observer coverage is about 2% for the Gulf and South Atlantic shrimp fisheries due to decreases in effort in the fishery. [2] Federal gulf shrimp permit holders are required to carry an onboard observer if selected by the Southeast Regional Office to participate in the Galveston Laboratory	

Observer Program. This requirement is mandated by 50 CFR Section 622.52 and participation is a condition for annual renewal of federal shrimp permits.[3] Permit holders are selected by the Southeast Regional Director through a stratified random sampling method. 50 CFR Section 622.52 requires any vessel with a Gulf commercial shrimp vessel permit, if selected by the SRD, to carry a NMFS-approved observer and allow the observer free and unobstructed access to the vessel's bridge, working decks, holding bins, weight scales, holds, and any other spaces used to hold, process, weigh or store fish.

The Galveston Lab Shrimp Bycatch Reduction Device Evaluation Research consists of onboard monitoring and scientific data analysis of the Gulf of Mexico shrimp fleet. The observer program evaluates species composition of shrimp trawl bycatch, and efficacy of turtle excluder devices (TEDs) and bycatch reduction devices (BRDs).[4] The fishery observer program was established in 1987 as a voluntary program through the Gulf and South Atlantic Fisheries Foundation, Inc. (GSAFF) and became cooperative research program in 1992 between GSAFF and NOAA Fisheries. The shrimp FMP amendment 13 made the program mandatory for the Gulf of Mexico shrimp fleet in federal waters.[5] The Galveston Lab observer program is part of National Observer Program under NOAA Office of Science and Technology.[6] Data collection by observers is carried out under standardized protocols defined in an observer training manual specific to the Southeast otter trawl and reef fish fisheries. [7]

In 2012, observer coverage was added for the inshore skimmer trawl fishery in the northern Gulf of Mexico due to increased sea turtle stranding reports and coverage continued in 2013 and 2014.[8] Since Texas does not allow skimmer trawls in state waters, Texas is not included in this coverage for the inshore fleet. The primary objectives were to document interactions with threatened or endangered sea turtles during commercial shrimping operations and to quantify both target and non-target species by area. Coverage is currently low due to difficulties with accurate contact information in state license databases, significant changes in the inshore fleet due to economic difficulties, lack of vessel insurance (which is a requirement for carrying observers), and difficulty in determining participants based on gear type since some states do not issue licenses based on gear type. Reports on the skimmer trawl observer coverage are published annually.

There is currently no observer coverage for shrimp vessels in states waters of Texas.

Authority to mandate observer coverage falls under the ESA and MSA.[9]

There are criticisms by some stakeholders, including environmental NGOs, that the current % coverage is not an adequate and could lead to the "observer effect", where fishermen modify their behavior when observers are present; however, NOAA Fisheries analysts consider coverage to be sufficient to fulfill the current goals of the program.

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[3] 50 C.F.R. § 622.52 http://www.gpo.gov/fdsys/granule/CFR-2013-title50-vol12/CFR-2013-title50-vol12-sec622-52

[4] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[5] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[6] "National Observer Program: Shrimp" *NOAA Office of Science and Technology*. Web. Accessed November 2015. https://www.st.nmfs.noaa.gov/observer-home/regions/southeast/shrimp

[7] NMFS. Observer Training Manual: Characterization of the US Gulf of Mexico and Southeastern Atlantic Otter Trawl and Bottom Reef Fish Fisheries. September 2010. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/pdf/Shrimp_Reef_fish_Manual_9_22_10.pdf

[8] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[9] "2015 Annual determination to implement Sea Turtle Observer Requirement" *Federal Register*. Web. Accessed November 2015. https://www.federalregister.gov/articles/2015/03/19/2015-06341/2015-annual-determination-to-implement-the-sea-turtle-observer-requirement

7.7.3 (iii) - inspection schemes? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Marine resource laws are enforced by both the USCG and NOAA Office of Law Enforcement. Vessels are subject to inspection by both the USCG, and NOAA enforcement agents. [1,2] The MSA Section 311 authorizes the following:[3] *(b) POWERS OF AUTHORIZED OFFICERS.—* *(1) Any officer who is authorized (by the Secretary, the Secretary of the department in which the Coast Guard is operating, or the head of any Federal or State agency which has* *entered into an agreement with such Secretaries under subsection (a)) to enforce the provisions of this Act may—* *(A) with or without a warrant or other process—*		

(i) arrest any person, if he has reasonable cause to believe that such person has committed an act prohibited by section 307;
(ii) board, and search or inspect, any fishing vessel which is subject to the provisions of this Act;
(iii) seize any fishing vessel (together with its fishing gear, furniture, appurtenances, stores, and cargo) used or employed in, or with respect to which it reasonably appears that such vessel was used or employed in, the violation of any provision of this Act;
(iv) seize any fish (wherever found) taken or retained in violation of any Provision of this Act;
(v) seize any other evidence related to any violation of any provision of this Act; and
(vi) access, directly or indirectly, for enforcement purposes any data or information required to be provided under this title or regulations under this title, including data from vessel monitoring systems, satellite-based maritime distress and safety systems, or any similar system, subject to the confidentiality provisions of section 402;
(B) execute any warrant or other process issued by any court of competent jurisdiction; and
(C) exercise any other lawful authority.

(2) Subject to the direction of the Secretary, a person charged with law enforcement responsibilities by the Secretary who is performing a duty related to enforcement of a law regarding fisheries or other marine resources may make an arrest without a warrant for an offense against the United States committed in his presence, or for a felony cognizable under the laws of the United States, if he has reasonable grounds to believe that the person to be arrested has committed or is committing a felony. The arrest authority described in the preceding sentence may be conferred upon an officer or employee of a State agency, subject to such conditions and restrictions as are set forth by agreement between the State agency, the Secretary, and, with respect to enforcement operations within the exclusive economic zone [and special areas], the Secretary of the department in which the Coast Guard is operating.*

The USCG Living Marine Resources program provides at-sea enforcement of federal fisheries regulations and other regulations relating to national goals for conservation and management of living marine resources and their environments. To enforce these laws, all USCG officers and petty officers have the authority to board and inspect and United States vessel in any location.[4]

Texas:
Texas Game Wardens have the right, authorized under Texas Parks and Wildlife Code §12.102 to inspect any person who is engaged in, or has reasonable belief that said person was engaged in, an activity governed by the Texas Parks and Wildlife Code.[6] Game Wardens have the authority to inspect:

- licenses, permits, tags, or other documents issued by TPWD
- gear used to catch a wildlife resource
- any wildlife resources in the persons possession
- the contents of any container that is commonly used to store or conceal wildlife resources

TPWD also inspects catch and landings reports submitted by dealers through the Trip Ticket Program.[5]		

[1] United States Coast Guard. *Special Notice to Mariners*. 2001. http://www.uscg.mil/d1/prevention/NavInfo/navinfo/documents/Enforcement.PDF

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] United States Coast Guard, 2001.

[5] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

7.7.3 (iv) - vessel monitoring schemes? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	Federal: Federally permitted commercial shrimp vessels in the Gulf of Mexico EEZ are required to participate in an electronic logbook (ELB) program.[1] Amendment 13 of the GMFMC shrimp FMP implemented an ELB program for the federal shrimp fleet to better track shrimp effort and location.[2] The main purposes of this program are to provide more accurate data to inform annual shrimp stock assessments and annual assessments of mortality for several known bycatch species of the shrimp trawl fishery including red snapper, sea turtles, blacknose shark, and smalltooth sawfish.[3] If selected, vessels must carry a data recording device, which is a time-stamped GPS unit that records vessel location at 10- minute intervals. Under the initial ELB program (which began in 2007), data were collected by a technician who met the boat at the dock to download data from the device. Under the new cellular ELB (cELB) system (which began in 2014), data are transmitted directly to the Galveston Lab through a cellular network when the vessel is in cellular range.[4] Data are compiled and analyzed in shrimp effort estimate reports every four months. Participants are selected by the Southeast Regional Director through a stratified random sampling method, and 500 vessels (approximately 1/3 of the fleet) has been selected to participate each year since the start of the program. Participating vessels must annually report information regarding the size and number of shrimp trawls deployed and the types of bycatch reduction devices (BRDs) and turtle excluder devices (TEDs) used. Participation, if selected, is a condition of renewal for federal permits. **Texas:** There is no VMS or logbook requirement for shrimp vessels in Texas state waters.	

[1] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Framework Action to Establish Funding Responsibilities for the Electronic Logbook Program in the Shrimp Fishery of the Gulf of Mexico*. 2013.
http://gulfcouncil.org/docs/amendments/Final%20Shrimp%20ELB%20Abbreviated%20Framework.pdf

[4] "SPGM Electronic Log Book" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015.
http://www.galvestonlab.sefsc.noaa.gov/ELB/

7.7.5 (a) Have States which are members of or participants in subregional or regional fisheries management organizations or arrangements taken steps to implement (into legislation and practice) agreed measures adopted in the framework of such organizations or arrangements?
Yes...[1] Some... [½] No...[0]

Extent of compliance		
Yes	**Some**	**No**
Management measures developed by the GMFMC through FMPs and amendments are carried out by NOAA SERO and implemented into regulation through the CFR. Regulations that are promulgated through the CFR are required by law for all participants fishing in the U.S. EEZ and are enforced by NOAA Fisheries Law Enforcement and the USCG Living Marine Resources division.[1,2,3] Regulations made by GMFMC are respected by the individual states and state regulations for territorial waters are consistent with federal regulations.[4] Each of the five Gulf States has a JEA with NOAA Fisheries through the Cooperative Enforcement Program which allows U.S. state conservation law enforcement officers to enforce federal laws and regulations pertaining to marine resources and endangered species.[5]		

[1] 50 C.F.R. § 622
http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015.
http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015).
http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015.
http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

7.7.5 (b) In particular, have measures been adopted to deter the activities of vessels of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**

Federal: According to the U.S. Code of Federal Regulations, it is unlawful for any person to "engage in an activity for which a valid Federal permit, license, or endorsement is required under this part without such permit, license, or endorsement."[1] Applicants must submit the Federal Permit Application for Vessels Fishing in the Exclusive Economic Zone (EEZ) to the NOAA Fisheries Southeast Regional Permits Office.[2] No person or vessel may harvest shrimp or possess shrimp in or from the Gulf EEZ without a commercial vessel permit on board.[3] NOAA Enforcement and USCG monitor and enforce these regulations in federal waters. **Texas:** No vessels may operate in Texas territorial waters without an appropriate license. Waters are patrolled by TPWD agents to ensure that all vessels participating in fishing activities have the proper authorization.[4]		

[1] 50 C.F.R. § 622.13 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_113

[2] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[3] 50 C.F.R. § 622.4 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_14

[4] "Law Enforcement Division" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/business/about/divisions/law_enforcement/

Article 8 - Fishing Operations

8.1 Duties of all States

8.1.1 Are states involved in the fishery ensuring that only fishing operations allowed by them are conducted within waters under their jurisdiction and that these operations are carried out in a responsible manner? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: According to the U.S. Code of Federal Regulations, it is unlawful for any person to "engage in an activity for which a valid Federal permit, license, or endorsement is required under this part without such permit, license, or endorsement."[1] Applicants must submit the Federal Permit Application for Vessels Fishing in the Exclusive Economic Zone (EEZ) to the NOAA Fisheries Southeast Regional Permits Office.[2] No person or vessel may harvest shrimp or possess shrimp in or from the Gulf EEZ without a commercial vessel permit on board.[3] NOAA's Office of Law Enforcement protects oceanic wildlife and habitat through		

enforcement of domestic laws and international treaty requirements. Special agents and enforcement officers ensure compliance with U.S. marine resource laws and take action when laws are violated.[4] NOAA's Office of the General Counsel is responsible for prosecuting civil penalty cases, permit sanctions, and administrative forfeitures. Together, these two offices ensure that fishery regulations in the Gulf EEZ are administered and adhered to by resource users.[5] **Texas:** No fishing vessels may operate in Texas territorial waters without an appropriate license issued by TPWD. Licenses are available for both Texas residents and non-residents of other U.S. Gulf States. The other four Gulf States also maintain similar licensing requirements for fishing activities within their state territorial waters.[6] License requirements for recreational and commercial fishing are published annually by TPWD.[7] Waters are patrolled by TPWD agents to ensure that all vessels participating in fishing activities have the proper authorization and follow all regulations set by TPWD.[8]		

[1] 50 C.F.R. § 622.13 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_113

[2] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[3] 50 C.F.R. § 622.4 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_14

[4] "Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/what_we_do.html

[5] *NOAA Office of General Counsel*. Web. Accessed November 2015. http://www.gc.noaa.gov/enforce-office.html

[6] Gulf States Marine Fisheries Commission, *Licenses & Fees for Alabama, Florida, Louisiana, Mississippi, and Texas in Their Marine Waters for the Year 2012*. Gulf states Marine Fisheries Commission. Ocean Springs, MS, 2013. http://www.gsmfc.org/publications/GSMFC%20Number%20219.pdf

[7] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[8] "Law Enforcement Division" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/business/about/divisions/law_enforcement/

8.1.2 Are States involved in the fishery maintaining a record, updated at regular intervals, on all authorizations to fish issued by them? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA Fisheries SERO Permits Office is tasked with managing federal fishing permits of the Gulf of Mexico.[1] 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. The Southeast Permits Office also manages the Catch History for vessels and permits, which can be requested by the permit or vessel owner.[2] 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.[3] **Texas:** Commercial fishing licenses issued by TPWD are renewed annually and TPWD maintains a record of all licenses sold.[4] Additionally, seafood dealers and processors can only purchase seafood from a harvester with a valid commercial fishing license and are required to report harvest data monthly through the Trip Ticket Program.[5,6]		

[1] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[2] "Permits FAQ" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[3] "Permit Holder Information" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/SPGM.htm

[4] "Commercial Licenses" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/business/licenses/public/commercial/

[5] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[6] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

8.1.3 Are states involved in the fishery maintaining, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations allowed by them? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The SEFSC Fisheries Monitoring Branch monitors the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers.		

Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for full details on the GSS).[2] Furthermore, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal.[3] ALF forms are mailed to permit holders each spring to report on landings from the previous year. Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program (refer to 7.1.7(a) for full details on these programs). [4,5]

NOAA Fisheries SERO Permits Office is tasked with managing federal fishery permits of the Gulf of Mexico.[6] The Southeast Permits Office issues permits for 7 to 17 months. Limited access (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. The Southeast Permits Office also manages the Catch History for vessels and permits, kept internally, but can be made available to the permit or vessel owner upon request.[7] Records of vessel permits are kept internally by the Permits Office, and are also posted online; information regarding the vessel identification, vessel name, permit holder address, permit effective date and expiration are listed on the SERO website.

Vessels operating in the EEZ are required to register with the USCG. All vessels measuring over five tons (generally any vessel over 25 ft length) are required to have a Certificate of Documentation issued through USCG and the USCG maintains records of all federally documented vessels.[8]

NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states. Information gathered from this survey helps determine economic trends of the industry and helps understand the social and economic impacts regulation changes may have on the fishery and communities.[9]

NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the Gulf of Mexico shrimp fishery and produces the following reports: closure analysis reports for the Texas and Tortugas closure areas, annual stock assessment reports, shrimp stock trend analysis reports, recruitment overfishing monitoring reports, growth overfishing analysis reports, shrimp effort estimation and analysis reports and YPR analysis reports.[10]

Texas:
TPWD conducts both fishery-dependent and fishery-independent data collection to determine fishery trends and status of stocks. Fishery dependent data are gathered and monitored through the trip ticket program (refer to 7.1.7(a) for details).[11,12,13]

The GSMFC also conducts scientific monitoring and review processes on an annual basis for resource and harvest data. The GSMFC programs: FIN, IJF, Fisheries Economic Data Program, SEAMAP all work to standardize the format of the data

collection process based on program needs and coordinate with state agencies and other partners to carry out regular data collection and review.[14]		

[1] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[2] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[3] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[4] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "Permits FAQ" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[7] "Permit Holder Information" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/SPGM.htm

[8] "National Vessel Documentation Center" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/nvdc/nvdcfaq.asp#04

[9] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[10] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[11] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[12] Jan Culbertson, Lance Robinson, Page Campbell, and Linda Butler, *Trends in Texas Commercial Fishery Landings, 1981-2001*. (TPWD MDS No. 224, 2004) https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS224.pdf

[13] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[14] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

8.1.4 Are States involved in the fishery, within the framework of subregional or regional fisheries management organizations or arrangements, cooperating to establish systems for monitoring, control, surveillance and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their jurisdiction? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Each of the five Gulf States and NOAA Fisheries cooperate with neighboring state and federal agencies on monitoring and enforcement of the fishery across state		

jurisdictional boundaries. All states are actively involved in regional organizations, GSMFC and GMFMC, and cooperate in establishing systems for monitoring, control, surveillance and enforcement of fishing operations throughout the Gulf of Mexico through these organizations.[1,2] All five Gulf States currently hold cooperative agreements with federal partners through the JEA program.[3] The JEA is a formal partnership between NOAA Fisheries and each state agency on enforcement related activities that provides federal funding to state and territorial law enforcement agencies to perform enforcement of federal regulations. The GSMFC has a Law Enforcement Committee (LEC) that addresses regional fisheries enforcement needs and objectives.[4] The LEC consists of members from all five U.S. Gulf of Mexico states, NOAA's Office of Enforcement, and the USCG, with regular input from NOAA General Counsel and USFWS. The GSMFC IJF program also utilizes the LEC for advice during the FMP development process. GSMFC published a regional pocket guide for use by enforcement officers from all agencies.[5] GSMFC's LEC periodically convenes special work sessions to revise LEC's Operations and Strategic Plans to improve efforts towards regional enforcement goals.[6,7] GMFMC has a Law Enforcement Advisory Panel that advises the council on regional enforcement matters.[8] Enforcement of federal regulations developed through GMFMC are handled by NOAA Fisheries and USCG, and reported at regular intervals.[9]		

[1] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[2] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/

[3] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

[4] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[5] VanderKooy, S.J. 2014. *Rules and Regulations: Officer's Pocket Guide 2014-2015*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20230.pdf

[6] VanderKooy, S.J. 2012. *Gulf of Mexico Cooperative Law Enforcement Operations Plan 2013-14*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20208.pdf

[7] VanderKooy, S.J. 2012. *Gulf of Mexico Cooperative Law Enforcement Strategic Plan 2013-2016*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20207.pdf

[8] "Advisory Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/panels_committees/advisory_panels.php#LawEnforcement

[9] NMFS. *First Quarter FY 2008 Report, Gulf of Mexico and South Atlantic/Caribbean*. NOAA/NMFS Office for Law Enforcement Southeast Division. 2008. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/BB%202008-04/P%20-%20Enforcement%20Reports.pdf

8.1.7 Are education and training programs enhancing the education and skills of fishers and, where appropriate, their professional qualifications, taking into account agreed international standards and guidelines? **Yes...[1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
The primary form of training within the shrimp fishery is on-the-job training of newer members by more experienced fishers within the community. Texas Sea Grant at Texas A&M University maintains a Fisheries Assistance Program that addresses fisher needs and education based on current priorities in Texas.[1] This program currently focuses predominantly on the shrimp fishery of Texas, since this is the most economically important fishery. Texas Sea Grant has been active in training fishermen and captains across the entire Gulf of Mexico. In 2014, as part of a grant from the National Fish and Wildlife Foundation, a marine extension agent and a marine fisheries specialist traveled to conduct dockside inspections, reaching 500 captains and crewmembers.[2] The Gulf and South Atlantic Fisheries Foundation is a private, regional nonprofit research and development organization focused on the development of commercial fisheries in the South Atlantic and Gulf of Mexico.[3] The foundation has been active hosting workshops for commercial fishermen for at least 30 years. Efforts focused on in TED and BRD research and development and gear outreach have been deemed successful by NMFS and the Foundation.[4] The most recent outreach efforts by the Foundation were from 2011-2013.[5] In that time period, the Regional Coordinators for the project traveled to 8 States in the Gulf and South Atlantic, visiting 74 cities. Regional Coordinators disseminated TED and BRD instruction manuals in English, Spanish, and Vietnamese. Additionally, TEDs were inspected according to the NOAA Boarding Form to check for any non-compliances while boats were still at the dock and could address any issues. NOAA, in addition to being responsible for enforcement of TEDs, also has a Gear Monitoring Team (GMT) dedicated to outreach and education on TED regulations. The GMT may conduct targeted to areas of non-compliance based on boarding records.[5] The GMT coordinator's contact information is also published on NOAA's Southeast Fisheries Science Center's website and he can be contacted directly to do dockside inspections with no penalty attached prior to a vessel's departure.[6] Technology transfer between fishermen is also common. A 2002 project that evaluated BRDs in Mississippi vessels saw an increase in the use of BRDs from those involved in the study. Participating vessels found the use of BRDs to be effective at producing a higher quality product and reduces cull time. Many fishermen contacted the principle investigator and participating captains to assist with proper BRD installation in nets.[7]		

[1] "Fisheries Assistance Program" *Sea Grant Texas at Texas A&M University*. Web. Accessed June 2015. http://texas-sea-grant.tamu.edu/OurPrograms/FisheriesAssistance.html

[2] *Texas Sea Grant*. Web. Accessed June 2015. http://texasseagrant.org/focus-areas/sustainable-fisheries-and-aquaculture/

[3] *Gulf and South Atlantic Fisheries Foundation*. Web. Accessed June 2015. http://www.gulfsouthfoundation.org/

[4] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

[5] NOAA Fisheries. *Southeast Fishery Bulletin.* February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[6] "Sea Turtle Staff" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/turtles/staff.htm

[7] Burrage, D. 2002. *Inshore shrimp fishery effort and gear evaluations to mitigate natural disaster impacts on the Mississippi Inshore brown shrimp fishery*. Final Report.

8.1.8 Are records of fishers being maintained which should, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws? **Yes...[1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
	Federal: NOAA Fisheries SERO Permits Office is tasked with managing federal fishing permits of the Gulf of Mexico.[1] 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. The Southeast Permits Office also manages the Catch History for vessels and permits, which can be requested by the permit or vessel owner.[2] 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.[3] Vessels operating in the EEZ are required to register with the USCG. All vessels measuring over five net tons (generally any vessel over 25 ft length) are required to have a Certificate of Documentation through the USCG.[4] Each vessel must be marked with Certificate number and hailing port, and the Certificate of Documentation must be carried onboard the vessel. Certificates are valid for one year and USCG maintains records of all Certificates of Documentation. Fishing vessels must also obtain a fishing endorsement to participate in commercial fishing activities in the EEZ. USCG provides training and issues certificates for Master of Vessels for 25/50/100 Gross Ton vessels.[5] For vessels of 20 gross tons or more, the master of the vessel must have a written	

	agreement with each crewmember on the terms of employment as a crewmember. Crewmembers must be U.S. citizens, or aliens with legal documentation to work in the U.S.[5] The Captain (Master or individual in charge of the vessel) must be a U.S. citizen. **Texas:** TPWD requires a commercial fishing license to harvest fish or shellfish in Texas waters. For shrimp, harvesters are requires to hold a Shrimp/Captain License that must be renewed annually and records are maintained by TPWD.[6] Commercial boats must be registered and operators must have a valid Commercial Fishing Boat license to operate in Texas waters.[2] TPWD maintains records of license holders and boat registration. Fishermen are required to carry physical documentation of these licenses on board. No documentation is required for additional crew members. No documentation is required for additional crew members. There are currently no requirements based on competency and no records maintained for certification of competency within the shrimp fishery.	

[1] "SERO Permits Office" *NOAA Fisheries*. Web. Accessed December 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/index.html

[2] "Permits FAQ" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[3] "Permit Holder Information" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/SPGM.htm

[4] "National Vessel Documentation Center" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/nvdc/nvdcfaq.asp#04

[5] USCG. *Commercial Fishing Vessel Safety Digest*. 2008 http://www.uscg.mil/d1/prevention/commfishsafetydigest-20081.pdf

[6] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[7] "Boat Registration" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/fishboat/boat/owner/titles_and_registration/

8.1.9 Do measures applicable in respect of masters and other officers charged with an offence relating to the operation of fishing vessels include provisions which may permit, *inter alia*, refusal, withdrawal or suspension of authorizations to serve as masters or officers of a fishing vessel?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
No	**Some**	**no**
	Federal: There are no provisions which may permit the refusal or suspension of authorizations	

	to serve as masters or officers of a fishing vessel as a means to enforce federal regulations. However, permits attached to the fishing vessel itself can be suspended or revoked, as explained in 7.7.2 (c).[1] **Texas:** When a vessel is involved in a violation, the individual registered as captain is held primarily responsible (owners are only held responsible if they were knowingly involved). Commercial bay or bait shrimp boat licenses may be suspended if the license holder (or the operator of the licensed vessel) is found guilty of one or more flagrant offenses (totaling three for the vessel). Flagrant offenses include trawling in a nursery area, shrimping longer than 30 minutes before or after legal shrimping hours, exceeding possession limits, exceeding legal net size, and falsifying information. Suspensions range from six months to one year. Licenses may also be permanently revoked for the following reasons:[2] • The license holder has two previous suspended licenses • The license holder is convicted of one or more flagrant offenses (totaling three) • The offenses occur within a 24-consecutive-month period	

[1] "SERO Permits Office" *NOAA Fisheries*. Web. Accessed December 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/index.html

[32] Tex. Admin. Code Title 5 Ch. 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

8.1.10 Is an attempt being made to ensure that, through education and training, all those engaged in fishing operations are given information on the most important provisions of this Code, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations? **Yes...[1]Some... [½]No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: GMFMC and NOAA Fisheries publish fishing regulation guides and bulletins containing all regulations and other necessary information regarding commercial fishing in the EEZ. These regulations are posted on websites, distributed through newsletters and published in print form.[3] These regulations, as illustrated in other areas of this report, are largely consistent with the important provisions of the CCRF and other relevant international conventions and standards that are applicable to responsible fishing operations. **Texas:** TPWD publishes a commercial fishing guide annually containing all regulations and other necessary information regarding the practice of commercial fishing in Texas.[4] These regulations and additional information are also publicized on the TPWD website and distributed through newsletters, emails, and social media outlets.[5] These regulations, as illustrated in other areas of this report, are largely consistent with the important provisions of the CCRF and other relevant international conventions and standards that are applicable to responsible fishing operations.		

[1] "Fishing Regulations" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/index.php

[2] "Regulations/Policy Branch" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/index.html

[3] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.texas.gov/fishboat/fish/commercial/index.phtml

8.2 Flag State duties

8.2.1 (a) Are states maintaining records of fishing vessels authorized to fish, which indicate details of the vessels, their ownership and authorization to fish? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA Fisheries SERO Permits Office is tasked with managing federal fishing permits of the Gulf of Mexico.[1] Refer to 8.1.2 for full details. **Texas:** A commercial fisherman's license is required to harvest fish in coastal and marine waters of the state, and fishing activity is documented through the Trip Ticket Program.[2,3] Refer to 8.1.2 for full details.		

[1] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[2] Tex. Admin. Code Title 2 Ch. 12 http://www.statutes.legis.state.tx.us/Docs/PW/pdf/PW.12.pdf

[3] David Donaldson, *Overview of State Trip Ticket Programs in Gulf of Mexico* (SEDAR7-DW-20, 2004) http://sedarweb.org/docs/wpapers/SEDAR7_DW20.pdf

8.2.1 (b) Have such vessels have been issued with, and carry on board, a license/permit and authorization to fish? ***Yes...***[1] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: To fish for shrimp in the Gulf's EEZ, a commercial vessel permit for Gulf shrimp must have been previously obtained and must be aboard the vessel.[1] **Texas:** For the shrimp fishery, a specific Commercial Shrimp Boat License (either Bay, Bait		

or Gulf) is required and must be renewed annually.[2] TPWD issues two license plates that must be displayed on the vessel confirming authorization to crab commercially.[3] At the time of registration of a vessel, the vessel owners are also issued a title for the vessel and a registration ID card, both of which must be carried onboard.[4]		

[1] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_150

[2] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[3] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[4] "Boat Registration" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/fishboat/boat/owner/titles_and_registration/

8.2.4 Is there legislation requiring fishing gear to be marked, taking into account uniform and recognizable gear marking systems, in order that the owner of the gear can be identified?
Yes...[1]Some... [½]No...[0]

Extent of compliance		
Yes	**Some**	**No**
Shrimp gear remains attached to the vessel continuously while fishing; therefore, there are no specific regulations requiring the marking of gear at either the state or the federal level.[1,2] Vessels are required to be marked with the appropriate state or federal identification number.		

[1] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[2] GMFMC. *Commercial Fishing Regulations for Gulf of Mexico Federal Waters.* January 2015. http://gulfcouncil.org/fishing_regulations/CommercialRegulations.pdf

8.2.7 (a) Are states taking enforcement measures in respect of fishing which have been found by them to have violated applicable conservation and management measures, including, where appropriate, making the violation of such measures an offence under state legislation?
Yes...[1]Some... [½]No...[0]

Extent of compliance		
Yes	**Some**	**No**
Fishing regulations are mandated under state and federal legislation and strictly enforced by several agencies. Refer to 7.7.2(a) for details of laws pertaining to fishing regulations and enforcement activities in place to ensure compliance.		

8.2.7 (b) Are sanctions applicable in respect of violations and illegal activities adequate in severity to be effective in securing compliance and discouraging violations wherever they occur?
Yes...[1]Some... [½]No...[0]

Extent of compliance		
Yes	**Some**	**No**
Penalties and sanctions for violating state and federal fishing regulations are in place and actively enforced. Law enforcement reports by several agencies indicate		

that compliance is high. Refer to 7.7.2(b) for full details on sanctions and compliance of the Texas shrimp fishery.		

8.4 Fishing operations

8.4.2 Have States prohibited within national legislation dynamiting, poisoning and other comparable destructive fishing practices? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: The U.S. Code of Federal Regulations prohibits destructive fishing practices, including use of explosives, toxic chemicals or plants, fish traps, bottom trawls without weak links, and the use of Gulf reef fish as bait.[1] **Texas:** TPWD prohibits the use of any gear types that are not authorized by a proclamation within the Texas Parks and Wildlife Code.[2] Texas Parks and Wildlife Code Section 66.003 specifically prohibits placing explosives or harmful substances in Texas state waters.[3]		

[1] 50 C.F.R. § 622.9 http://www.ecfr.gov/cgi-bin/text-idx?SID=7663a4568ee406f4e5bcf64f9bfd4de2&node=pt50.12.622&rgn=div5#se50.12.622_19

[2] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[3] Tex. Parks & Wild. Code § 66.003 http://www.statutes.legis.state.tx.us/Docs/PW/pdf/PW.66.pdf

8.4.3 (a) Is documentation required with regard to fishing operations, retained catch of fish and non-fish species and, as regards discards, the information required for stock assessment as decided by relevant management bodies, collected and forwarded systematically to those bodies?

(i) - documentation on fishing operations **Yes...[1]Some... [½]No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Documentation on fishing operations is maintained by state and federal agencies for fishing activities in Texas and U.S. Gulf of Mexico waters. Refer to 8.1.3 for details on requirements and documentation maintained by each agency.		

8.4.3 (a)(ii) - documentation on non-fish catches **Yes...[1]Some... [½]No...[0]**

Extent of compliance		
Yes	**Some**	**No**
	Federal: NOAA Fisheries does not require the direct reporting of non-fish species; however, reporting of interactions with some species is required by the Office of Protected	

Species.

The NOAA Office of Protected Resources annually reviews interactions between fisheries and the protected species under management. There are currently 125 endangered or threatened marine species that fall under NOAA jurisdiction through the ESA, and all marine mammals under the MMPA.[1]

ESA species:
There are several species listed under the ESA as threatened or endangered that are known bycatch of the shrimp fishery, including all five sea turtle species found in the Gulf of Mexico, smalltooth sawfish and Gulf sturgeon.[2] There is currently no direct reporting requirement for interactions with these species. NOAA Office of Protected Resources calculates the annual take of these species based on data from the Observer Program combined with detailed shrimp effort data from the ELB program.[3] Compliance with TED requirements is also monitored and the Gulf of Mexico shrimp fishery must maintain an 88% compliance rating, otherwise NOAA is required to take action to reduce potential mortality of sea turtles, which could include closure of the fishery.[4]

Marine Mammals:
The office of Protected Resources currently lists the Gulf of Mexico shrimp fishery as a Category II fishery, indicating that the annual mortality or serious injury of a marine mammal stock is greater than 1% but less than 50 % of the stocks potential biological removal (PBR).[5] The Gulf of Mexico shrimp fishery is known to interact with bottlenose dolphins and lack of a calculated PBR for the Gulf of Mexico bottlenose dolphin populations, data from stranding programs, and low observer coverage in the fishery are all reasons that prompted NOAA to assign a Cat. II ranking. Cat. II designation requires that each fishery participant be registered with the Office of Protected species and carry an authorization certificate. Typically, registration with the Marine Mammal Authorization Program is combined with state and federal permitting systems and all fishermen receiving permits are registered with the Office of Protected Species automatically. Cat. II requirements also require the fishery to have an observer program and fishermen must carry an observer onboard if requested, and must comply with any take reduction plans in place. There is currently no take reduction plan in the Gulf of Mexico for bottlenose dolphins. Fishermen are also required to report all incidental injuries and mortalities of marine mammals to the Office of Protected Species.

Texas:
There is currently no reporting requirement for capture of non-fish species in Texas.

[1] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/

[2] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[3] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[4] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[5] "List of Fisheries" *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/interactions/lof/

8.4.3 (a)(iii) - documentation on fish catches **Yes...[1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: The SEFSC Fisheries Monitoring Branch monitors the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected from each individual state agency Trip Ticket Reporting Program. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for full details on the GSS).[2] Furthermore, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. ALF forms are mailed to permit holders each spring to report on landings from the previous year.[3] **Texas:** TPWD meets required standards of data collection through the Trip Ticket Program and previously through the Month Aquatic Products Reports (MAPR).[4,5] TPWD has collected data on marine species commercial landings from Texas bays and the Gulf of Mexico since 1936. MAPR, a mandatory self-reporting program by dealers, collected landings data on marine fishers, oysters, crabs and shrimp. The MAPR required the reporting of total weight, body of water fished and price paid for each species purchased by month, due on the 10th of each month.[6] In 1985, TPWD and NMFS formalized a cooperative agreement to collect and exchange statistics on commercial fisheries. In 2005, TPWD enhanced their data collection for fisheries statistics by instituting a voluntary Trip Ticket Program, which became mandatory for all dealers by September 1, 2006.[7,8,9] The Trip Ticket Program conforms with the standard trip ticket systems instituted in the other four Gulf states and was coordinated through GSMFC FIN program.[10] Standard data collected through the Trip Ticket Program includes trip date, trip number (if more than one trip per day), vessel ID number, fishermen license number, species, quantity landed, condition landed, market size range, ex-vessel price or value, county or port landed, dealer ID, unloading date, primary gear, and area fished.[11]		

[1] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[2] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[3] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[4] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[5] Page Campbell, Ted Storck, Vanenise Price, and Lance Robinson, 1992. Trends in Texas Commercial Fishery Landings, 1972-1991. TPWD MDS No. 86, 1992. http://www.tpwd.state.tx.us/publications/pwdpubs/media/mds_coastal/Series%202_MDS86.pdf

[6] Jan Culbertson, Lance Robinson, Page Campbell, and Linda Butler, *Trends in Texas Commercial Fishery Landings, 1981-2001*. (TPWD MDS No. 224, 2004) https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS224.pdf

[7] Texas Parks and Wildlife Department. *Trip Ticket Program Newsletter Quarterly Update Vol. 1 Issue 1.*

[8] Texas Parks and Wildlife Department, *Trip Ticket Program Implementation Timeline*. Unpublished.

[9] FIN Committee, *Annual Report of the Fisheries Information Network in the Southeast Region (FIN) January 1, 2006 - December 31, 2006*. Gulf States Marine Fisheries Commission. Ocean Springs, MS, 2007. http://www.gsmfc.org/publications/GSMFC%20Number%20148.pdf

[10] David Donaldson, *Overview of State Trip Ticket Programs in Gulf of Mexico* (SEDAR7-DW-20, 2004) http://sedarweb.org/docs/wpapers/SEDAR7_DW20.pdf

[11] Donaldson, 2004

8.4.3 (b) Is such an observer and inspection scheme being established in order to promote compliance with applicable (fishery management) measures? **Yes...[1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
	OBSERVER SCHEME: Amendment 13 of the shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition. These methods include the implementation of mandatory observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition.[1] Federal gulf shrimp permit holders are required to carry an onboard observer if selected by the Southeast Regional Office to participate in the Galveston Laboratory Observer Program. This requirement is mandated by 50 CFR Section 622.52 and participation is a condition for annual renewal of federal shrimp permits.[2] Permit holders are selected by the Southeast Regional Director through a stratified random sampling method. 50 CFR Section 622.52 requires any vessel with a Gulf commercial shrimp vessel permit, if selected by the SRD, to carry a NMFS-approved observer and allow the observer free and unobstructed access to the vessel's bridge, working decks, holding bins, weight scales, holds, and any other	

spaces used to hold, process, weigh or store fish.

The Galveston Lab Observer Program consists of onboard monitoring and scientific data analysis of the Gulf of Mexico shrimp fleet with a focus on bycatch characterization and shrimp bycatch reduction device evaluation. The observer program evaluates species composition of shrimp trawl bycatch, and efficacy of TEDs and BRDs.[3]

Due to the high costs of outfitting boats with observers, NOAA Fisheries determined that 1% coverage would be adequate to document information on bycatch composition in the fishery when the observer program was made mandatory by shrimp FMP amendment 13.[4] Amendment 13 notes that 5% coverage is typical of standard observer programs; however, the expense of outfitting the Gulf and South Atlantic shrimp fleet at 5% coverage is too cost prohibitive, and given the current economic condition of the fishery, the industry could not be asked to incur the cost. As part of the bycatch data collection methodology set by amendment 13, the data gathered by observers at the 1% coverage level would then be combined with detailed effort data from the ELB program to extrapolate total bycatch numbers for the fishery. The most recent report from the observer program, published in 2012, indicates that observer coverage is now at about 2% for the Gulf and South Atlantic shrimp fisheries due to decreases in effort in the fishery.[5] Observer coverage through this program only applies to the offshore fleet with federal permits and does not cover inshore state-licensed shrimp trawls. The National Bycatch Report, published by NOAA, considers the Gulf of Mexico shrimp trawl observer coverage to be at a pilot/baseline stage and ranks the fishery as a Tier 2 for bycatch estimation, indicating that methods for obtaining data and estimating bycatch need improvements before being considered reliable.[6]

There are strong criticisms by some stakeholders, including environmental NGOs, that the current percent coverage is not an adequate to ensure compliance with conservation measures and is likely to lead to the "observer effect", where fishermen modify their behavior when observers are present.

INSPECTION SCHEME:

Federal:

Marine resource laws are enforced by both the USCG and NOAA Office of Law Enforcement. Vessels are subject to inspection by both the USCG, and NOAA enforcement agents.[7,8]

The MSA Section 311 authorizes the following:[9]

(b) POWERS OF AUTHORIZED OFFICERS.—

(1) Any officer who is authorized (by the Secretary, the Secretary of the department in which the Coast Guard is operating, or the head of any Federal or State agency which has

entered into an agreement with such Secretaries under subsection (a)) to enforce the provisions of this Act may—

(A) with or without a warrant or other process—

(i) arrest any person, if he has reasonable cause to believe that such person has

committed an act prohibited by section 307;
(ii) board, and search or inspect, any fishing vessel which is subject to the provisions of this Act;
(iii) seize any fishing vessel (together with its fishing gear, furniture, appurtenances, stores, and cargo) used or employed in, or with respect to which it reasonably appears that such vessel was used or employed in, the violation of any provision of this Act;
(iv) seize any fish (wherever found) taken or retained in violation of any provision of this Act;
(v) seize any other evidence related to any violation of any provision of this Act; and
(vi) access, directly or indirectly, for enforcement purposes any data or information required to be provided under this title or regulations under this title, including data from vessel monitoring systems, satellite-based maritime distress and safety systems, or any similar system, subject to the confidentiality provisions of section 402;
(B) execute any warrant or other process issued by any court of competent jurisdiction; and
(C) exercise any other lawful authority.

(2) Subject to the direction of the Secretary, a person charged with law enforcement responsibilities by the Secretary who is performing a duty related to enforcement of a law regarding fisheries or other marine resources may make an arrest without a warrant for an offense against the United States committed in his presence, or for a felony cognizable under the laws of the United States, if he has reasonable grounds to believe that the person to be arrested has committed or is committing a felony. The arrest authority described in the preceding sentence may be conferred upon an officer or employee of a State agency, subject to such conditions and restrictions as are set forth by agreement between the State agency, the Secretary, and, with respect to enforcement operations within the exclusive economic zone [and special areas], the Secretary of the department in which the Coast Guard is operating.*

The USCG Living Marine Resources program provides at-sea enforcement of federal fisheries regulations and other regulations relating to national goals for conservation and management of living marine resources and their environments.[10]

NOAA/NMFS Southeast Division OLE provides quarterly reports for activity in the Gulf of Mexico and South Atlantic/Caribbean. This document includes reporting of incidents by investigation type for violations of the MSA, National Marine Sanctuary Act, ESA, Marine Mammal Protection Act, Lacey Act, and other Federal and State regulations,(see chart below for FY 2013 4th Quarter statistics.)[11] This report includes information on OLE outreach and training activities and JEA statistics by state.

Texas:
Inspection schemes are in place through the TPWD LED. Texas game wardens have the right, authorized under Texas Parks and Wildlife Code §12.102, to inspect any person who is engaged in, or has reasonable belief that said person was engaged in, an activity governed by the Texas Parks and Wildlife Code.[12] Game Wardens have the authority to inspect:

- licenses, permits, tags, or other documents issued by TPWD

	- gear used to catch a wildlife resource - any wildlife resources in the persons possession - the contents of any container that is commonly used to store or conceal wildlife resources TPWD also inspects catch and landings reports submitted by dealers through the Trip Ticket Program.[13]	

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] 50 C.F.R. § 622.52 http://www.gpo.gov/fdsys/granule/CFR-2013-title50-vol12/CFR-2013-title50-vol12-sec622-52

[3] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[4] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[5] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[6] National Marine Fisheries Service. 2011. *U.S. National Bycatch Report* [W. A. Karp, L. L. Desfosse, S. G. Brooke, Editors]. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-117C. http://www.nmfs.noaa.gov/by_catch/BREP2011/2011_National_Bycatch_Report.pdf

[7] United States Coast Guard, *Special Notice to Mariners*. 2001. http://www.uscg.mil/d1/prevention/NavInfo/navinfo/documents/Enforcement.PDF

[8] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed June 2015. http://www.nmfs.noaa.gov/ole/

[9] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[10] Department of Homeland Security, Office of Inspector General, *Annual Review of the United States Coast Guard's Mission Performance (FY 2010)*. Washington D.C., 2011. http://www.oig.dhs.gov/assets/Mgmt/OIG_11-111_Sep11.pdf

[11] NOAA Fisheries, Office of Law Enforcement. *Southeast Atlantic & Caribbean 4th Quarter FY 2013 Report*. 2013. http://safmc.net/sites/default/files/Regulations/pdf/Q42013OLEPublic%20Report.pdf

[12] "Inspection Authority" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/laws-penalties-restitution

[13] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

8.4.4 Is the adoption of appropriate technology being promoted taking into account economic conditions for the best use and care of the retained catch? **Yes...[1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
The Unites States Code, Title 21, Part 123 and Part 110 establish a mandatory seafood inspection program, Hazard Analysis and Critical Control Points (HACCP), and quality standards for the manufacture, packing and storing of food for human consumption.[1,2] The FDA maintains a Science and Research (Food) Program that continues to advance knowledge regarding best practices for handling and preparation, and consumer use of foods, including seafood.[3] At the state level, The Texas DSHS Seafood and Aquatic Life Group (SALG) inspects and certifies processors of shellfish in Texas under 25 T.A.C. Sections 241.1 - 241.9 and Sections 241.50 - 241.71.[4,5]		

[1] 21 U.S.C. 123 (FDA HACCP regulations)
http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=123

[2] 21 U.S.C. Part 110 (Federal Food, Drug and Cosmetics Act) http://www.gpo.gov/fdsys/pkg/USCODE-2011-title21/html/USCODE-2011-title21-chap9-subchapIV.htm

[3] "Science and Research (Food)" *U.S. Food and Drug Administration.* Web. Accessed November 2015.
http://www.fda.gov/Food/FoodScienceResearch/default.htm

[4] "Seafood and Aquatic Life Group" *Department of State Health Services (DSHS)*. Web. Accessed June 2015.
http://www.dshs.state.tx.us/seafood/

[5] 25 Tex. Admin. Code § 241
http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=25&pt=1&ch=241&sch=A&rl=Y

8.4.5 Are States and relevant groups from the fishing industry encouraging the development and implementation of technologies and operational methods that reduce discards?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The primary gear type in the Texas commercial shrimp fishery is the otter trawl. Beam trawls are also sometimes utilized in some inshore areas.[1] Federal and state regulations require the use of TED is all otter trawls in state and federal waters. Trawls are also required to use BRDs in state federal waters. <u>TEDs</u>: Federal regulations require the use of Turtle Excluder Devices (TEDs) in all otter trawls in the shrimp fishery in both state and federal waters to reduce sea turtle capture and mortality.[2] Federal regulations requiring TEDs in all otter trawls for the shrimp fishery went into effect in 1989. TEDs are not 100% effective; certified TED designs are required to meet a 97% efficiency rate for turtle exclusion within a 5 minute period. Current certified TEDs in use; therefore, are effective in allowing the escape of most turtles caught within shrimp trawls.		

Texas state law also requires the use of TEDs in shrimp trawls, which is enforced by TPWD.[3]

BRDs:
The U.S. Code of Federal Regulations also requires shrimp trawl vessels to be equipped with a certified bycatch reduction device (BRD) installed in each net used for fishing on their vessel.[4] To be certified by the NOAA Harvesting Systems Unit, a BRD must reduce finfish bycatch by at least 30% by weight.[5] BRDs are required in state waters in Texas.
Bycatch studies on the Texas Bay Shrimp Spring and Fall seasons from 1993-95 indicated that bycatch to shrimp ratios were higher in the Fall than in Spring and varied among bay systems throughout the coast.[6] The highest ratio was 4.25:1 in Matagorda Bay in Fall and the lowest ratio was .36:1 in Laguna Madre in the Spring. Major bycatch species identified were gulf menhaden (*Brevoortia patronus*), Atlantic croaker (*Micropogonias undulatus*), bay anchovy (*Anchoa mitchilli*), spot (*Leiostomus xanthurus*), sand seatrout (*Cynoscion arenunus*), hardhead catfish (*Anus felis*), pinfish (*Lagodon rhomboides*), lesser blue crab (*Callinectes sirnilis*), blue crab (*Callinectes sapidus*), Atlantic brief squid (*Lolliguncula brevis*) and cabbagehead (or cannonball) jellyfish (*Stomolophus meleagris*).

NOAA Harvesting Systems Unit:
The SEFSC Pascagoula Lab contains the Harvesting Systems Unit, which is a team of gear specialists and fishery biologists performing research into critical problems relating to commercial and recreational fishing gear to inform and improve fisheries resource management.[7] The Harvest Systems Unit is responsible for the development, evaluation, certification, and national and international technology transfer of turtle excluder devices (TEDs) for trawling gear. The Harvesting Systems Unit is also responsible for the development and assessment of bycatch reduction devices (BRDs) to reduce finfish bycatch in shrimp trawls. Research on TEDs and BRDs for the shrimp fishery is ongoing with annual testing on new designs of these devices to improve efficiency in reducing bycatch and minimizing shrimp loss and studies are conducted both independently, and in collaboration with commercial shrimpers through cooperative research projects. There are currently several certified designs of both TEDs and BRDs approved by the NOAA.[8,9] Harvesting Systems Unit also contains a Gear Monitoring Team (GMT) dedicated to outreach and education on TED and BRD regulations and use. The GMT conduct courtesy inspections of TEDs and BRDs installed on shrimp boats during dock visits, workshops and upon request to ensure that these devices are properly used and may focus on areas of higher non-compliance based on past boarding records.[10] The GMT coordinator's contact information is also published on NOAA's Southeast Fisheries Science Center's website and he can be contacted directly to do dockside inspections with no penalty attached prior to a vessel's departure.[11]

Additionally, Texas Sea Grant gear specialists have been active in training fishermen and captains across the Gulf of Mexico in all five states on TED and BRD use and other gear design improvements. In 2014, as part of a National Fish and Wildlife

Foundation grant, a marine extension agent and marine fisheries specialist traveled to conduct dockside inspections, reaching 500 captains and crewmembers.[12] The Gulf and South Atlantic Fisheries Foundation is a private, regional nonprofit research and development organization focused on the development of commercial fisheries in the South Atlantic and Gulf of Mexico. The foundation has been active hosting workshops for commercial fishermen for at least 30 years. Efforts focused on TED and BRD research and development and gear outreach have been deemed successful by NMFS and the Foundation.[13] The most recent outreach efforts by the Foundation were from 2011-2013. In that time period, the Regional Coordinators for the project traveled to 8 States in the Gulf and South Atlantic, visiting 74 cities. Regional Coordinators disseminated TED and BRD instruction manuals in English, Spanish, and Vietnamese. Additionally, TEDs were inspected according to the NOAA Boarding Form to check for any non-compliances while boats were still at the dock and could address any issues.		

[1] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[2] 50 CFR § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[3] 31 Tex. Admin. Code §58.160 https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

[4] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[5] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2002. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[6] Billy Fuls, Tom Wagner and Lawrence McEachron. *Characterization of Commercial Shrimp Trawl Bycatch in Texas During Spring and Fall Commercial Bay-Shrimp Seasons: 1993-1995.* (Texas Parks and Wildlife, Coastal Fisheries Division, MDS 180, 2002). https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS180.pdf

[7] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[8] "TED Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/designs.htm

[9] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[9] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[10] "Sea Turtle Staff" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/turtles/staff.htm

[11] *Texas Sea Grant*. Web. Accessed November 2015. http://texasseagrant.org/staff/tony-reisinger/

[12] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

8.4.6 Are technologies, materials and operational methods being applied that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Technologies, materials and methods are being applied by state and federal agencies to minimize the loss of fishing gear and effects of ghost fishing by lost or abandoned gear. Refer to 7.2.2 (g)(ii) response for full details of actions and regulations being taken by each agency.		

8.4.7 Are assessments being carried out of the implications of habitat disturbance prior to the introduction on a commercial scale of new fishing gear, methods and operations?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC website Fishing Regulations section lists allowable gear for each fishery. Allowable gear for the Gulf of Mexico commercial shrimp fishery includes otter trawl, skimmer trawl, butterfly net and cast net.[1] NOAA's Harvesting Systems Unit, housed at the Pascagoula Lab in Mississippi, is a team of biologists and gear specialists who perform critical research on fishing gear. The Harvesting Systems Unit does extensive research on fishing gear, methods, BRDs, and TEDs for the Gulf of Mexico shrimp fishery, including cooperative research with commercial industry members to test improved gear designs and methods.[2] All gear designs tested by the harvesting systems unit are fully evaluated for impacts. Additionally, any changes in allowable gear would go through the regulatory process, which requires an environmental assessment prior to implementation as required by NEPA and the MSA Section 304(i).[3] **Texas:** TPWD regulations guides explicitly state that only the methods and means of take stated within the regulations listed are lawful. Any other gear or methods outside of those described within the regulatory guide are unlawful.[4] Any new gear or methods being introduced to the fishery need to go through the regulatory process for authorization. Prior to proposing a regulation change to TPWC, TPWD conducts scientific research as well as economic consideration and environmental impact of the new regulation.		

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

8.4.8 Is research being promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities, being promoted?

(i) - on the environmental impacts? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Essential Fish Habitat (EFH) Generic Amendment (applied to all Gulf of Mexico FMPs) and accompanying EIS contain detailed information on the environmental impacts of fishing methods.[1,2] Section 6.1.2.1 of the amendment specifically pertains to impacts from trawl fisheries as does section 3.5.2 of the EIS. The EFH amendment also makes recommendations for minimizing impacts, which have been adopted by the GMFMC. Changes in allowable gear type would occur through amendment of the shrimp FMP and federal regulations. The National Environmental Policy Act (NEPA) requires the analysis of any potentially significant environmental impacts that may result from new regulations or agency actions by all federal government agencies. Section 304(i) of MSA requires compliance with NEPA regulations with regard to fishery management plans and actions.[3] NOAA Fisheries determines the analysis level necessary to comply with MSA and NEPA regulations for each FMP amendment and management action. A summary of findings is compiled in either a Record of Decision or a Finding of No Significant Impact (FONSI), which is included in each FMP or amendment. For the shrimp FMP, an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) has been conducted for each amendment, as necessary.[4] Additionally, Section 303 (a)(9) of the MSA requires that FMPs include a fishery impact statement (FIS) for the plan or amendment. The FIS includes an assessment of the likely biological, social, economic, and administrative effects, if any, of the conservation and management measures on fishery participants and their communities as well as participants in other fisheries conducted in adjacent areas.[5]		

[1] GMFMC. *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 1998. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINALEFH-%20Amendment%201-%20no%20appendices.pdf

[2] GMFMC. Final Environmental Impact Statement *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 2004. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20EFH%20EIS.pdf

[3] "National Environmental Policy Act Requirements" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/msa/nepa.html

[4] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[5] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

8.4.8 (ii) - on the social impacts? **Yes...**[1]**Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[1] Each year a third of the permit holders are randomly selected for this survey and information is used to assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. NOAA Southeast Fisheries Science Center also contains a Social Science Research Group (SSRG) that conducts applied research on socio-cultural aspects of marine resources in the Gulf of Mexico.[2] This research largely focuses on participant and community dependence and engagement in fisheries and is directed by the principles of the MSA National Standard 8:[3] - *Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.* Changes in allowable gear type would occur through amendment of the shrimp FMP and federal regulations. Section 303 (a)(9) of the MSA requires that FMPs include a fishery impact statement (FIS) for the plan or amendment. The FIS includes an assessment of the likely biological, social, economic, and administrative effects, if any, of the conservation and management measures on fishery participants and their communities as well as participants in other fisheries conducted in adjacent areas.[4] The GMFMC Shrimp FMP contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a Regulatory Impact Review.[5] NOAA Fisheries also requires a Regulatory Impact Review (RIR) for each regulatory action of public interest, which provides a review of the level and incidence of impacts associated with the action, a review of the problems and policies prompting the action, and ensures that the agency has		

comprehensively considered all alternatives.[6] All amendments and regulatory actions also go through public hearings and comment periods prior to implementation, which provides opportunity for additional input from industry members regarding potential impacts. **Texas:** Any change in gear or method of take for the fishery must go through the regulatory process for approval. TPWD conducts scoping meetings, direct stakeholder communications, public hearings, public comment opportunities and advisory committee meetings to address socioeconomic aspects for potential regulation changes.[7]		

[1] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[2] "Social Science Research Group" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[5] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[6] "Guidance for Conducting Economic and Social Analyses of Regulatory Actions. *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/economic_social/index.html

[7] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

8.4.8 (iii) - on the impact on biodiversity? **Yes...**[1]**Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
There are two overarching considerations for the Texas shrimp fishery with regard to conservation of biodiversity of ecosystems: bycatch and bottom habitat impacts. Research is being conducted at federal and state levels to monitor and assess potential impacts. ***Bycatch*:** Bycatch is a major concern in shrimp fisheries globally. A FAO report on fishery discards (Kelleher 2005) indicates that, world-wide, shrimp trawl fisheries have both the highest discard rate and volume of all fisheries.[1] This report also notes that warm-water shrimp trawl fisheries typically have significantly higher proportions of bycatch (average: 75% of total catch), than cold-water fisheries (average: 10% of total catch).		

Environmental impacts associated with bycatch include depletion of species typically caught as bycatch, which may include species that are listed as protected, endangered, or threatened (PET), and alterations of the food web such as trophic cascades. Managers and shrimp fishermen throughout the Gulf of Mexico have cooperated to develop and utilize best-practices for bycatch reduction and have made substantial progress in minimizing bycatch impacts. Collaboration is ongoing to develop innovative methods to further address bycatch concerns. NOAA Fisheries National Bycatch Report acknowledges the improvements made to the Gulf of Mexico shrimp fishery and also provides suggestions for additional improvement to research and monitoring.[2]

Promoting consistency with the ESA and MMPA, and minimizing incidental capture of finfish species are two major objectives of the GMFMC Shrimp FMP.[3] Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[4] These methods include the implementation of an ELB for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition.

The NOAA SEFSC Galveston Lab focuses research efforts on Fishery Management, Fishery Ecology and Protected Species with strong emphasis on research pertaining to all aspects of the shrimp fishery.[5] Data are collected on the shrimp fishery through the ELB Program and the Observer Program managed by the Galveston Lab. The ELB program began in 2007 and transferred to the cELB program in 2014.[6] If selected, Gulf shrimp permit holders are required to participate in the program and permit renewal is contingent upon participation. The ELB program collects data on amount and location of shrimp landings. Gulf shrimp permit holders are also required to carry an observer if selected for the Galveston Laboratory Observer Program, which also became mandatory in 2007. Similar to the ELB program, permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The focus of data collection for the shrimp fishery observer program is bycatch and BRD evaluation.[7] The Observer Program evaluates TEDs and BRDs, quantifies bycatch and characterizes bycatch species composition. The Galveston Lab regularly publishes research on the shrimp fishery and contributes data and research results to the National Observer Program, which also produces reports biannually. Bycatch data from the observer and ELB programs is also utilized by the SEDAR process when conducting stock assessments of other species.[8]

The most recent report on shrimp otter trawl bycatch (Scott-Denton et al. 2012) from the Galveston Lab determined that total bycatch to shrimp ratio had decreased to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[9] Characterization of bycatch composition from this report shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*), and sea turtles are also known bycatch species.[10] This bycatch species composition is consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in

Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Based on a recent analysis by Raborn et al. (2014) the only species (or species group) that represent 5% or higher in shrimp trawl bycatch are Atlantic croaker, Seatrouts, longspine porgy, and inshore lizardfish and analysis of these species indicates that shrimp trawl bycatch does not pose a threat to the populations of these species.[11]

The initial NOAA National Bycatch Report, published in 2011, indicated that the fishery bycatch ratio (ratio of the total fishery bycatch to total fishery catch) for the Gulf of Mexico shrimp fishery was .76, the highest of all U.S. fisheries analyzed in the report (some fisheries were data-deficient and could not be included- such as the South Atlantic shrimp trawl fishery).[12] The 2013 update to the National Bycatch Report indicates that improvements in bycatch estimation and bycatch reduction in the Gulf of Mexico shrimp trawl fishery have resulted in the reduction of the fishery bycatch ratio from .76 to .63.[13]

One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[14] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. USFWS and NOAA Office of Protected Resources are responsible for research and assessment of species on the endangered species list and assessments and recovery plans are updated every five years.[15] NOAA is also required to consult on activities that may impact endangered species and has produced several Biological Opinions relating to sea turtles and the shrimp trawl fishery in the Gulf of Mexico. The most recent biological opinion was published in 2014 and authorizes the continued operation of the shrimp trawl fishery.[16] A new consultation (resulting in a biological opinion) is initiated if there is new information or an action is modified that has not previously been considered, or if an incidental take statement is exceeded.

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 TEDs and BRDs.[17]

BOTTOM HABITAT IMPACTS:

Impacts on EFH are assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[18] The Initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico Shrimp FMP (brown, white, pink, and royal red). Section 6.1 identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is updated every five years.

[1] Kelleher, Kieran. *Discards in the world's marine fisheries: an update*. No. 470. Food & Agriculture Org., 2005. http://www.fao.org/docrep/008/y5936e/y5936e00.htm

[2] National Marine Fisheries Service. 2011. *U.S. National Bycatch Report* [W. A. Karp, L. L. Desfosse, S. G. Brooke, Editors]. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-117C. http://www.nmfs.noaa.gov/by_catch/BREP2011/2011_National_Bycatch_Report.pdf

[3] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[4] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[5] "Research" Sou*theast Fisheries Science Center, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/research_home/index.html

[6] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[7] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[8] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[9] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[10] National Marine Fisheries Service, 2011.

[11] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[12] National Marine Fisheries Service, 2011.

[13] National Marine Fisheries Service. 2013. U.S. National Bycatch Report First Edition Update 1 [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

[14] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[15] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[16] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[17] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[18] "Essential Fish Habitat Amendments" *Gulf of Mexico Fishery Management Council*. Web. Accessed November. 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

8.4.8 (iv) - on the impact on coastal fisheries? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The original Shrimp FMP implemented in 1981 identified several areas of user conflicts both with direct use of shrimp resources and with other marine resource users.[1] Direct users include recreational, live-bait, and commercial harvesters and both inshore and offshore fleets. - Conflicts have arisen between direct users over preferred size of harvest. Some users prefer smaller shrimp typically harvested inshore, especially for the live-bait industry; however, offshore vessels harvest larger shrimp for food consumption. Most states have developed seasons for harvest of shrimp designed to accommodate multiple user needs. Additionally, area and seasonal closures (Texas closure and Tortugas closure) have also been set for federal waters to allow for protection of smaller shrimp in some areas until they reach a larger size. In Texas, the specific shrimp seasons are set for Bay, Bait and Gulf licenses and harvest times are based on typical shrimp size certain times of the year. TPWD also conducts sampling each year to determine certain season dates based on shrimp size.[2,3] Other states have similar regulations for various direct user groups and conflicts have largely been minimized. Conflicts with other fisheries and user groups have also been identified. - Red snapper bycatch has been a major concern in the GOM shrimp fishery. The Red Snapper fishery in the Gulf of Mexico is considered overfished and is in a rebuilding plan. The rebuilding plan was put in place in 2001 with the goal of rebuilding the Gulf snapper stock by 2032. This rebuilding plan included a significant reduction in juvenile red snapper bycatch in the GOM shrimp Fishery. Amendment 9 of the shrimp FMP focused on reducing bycatch of juvenile red snapper in age 0 and age 1 groups by 50%, which was the amount determined by NOAA Fisheries as necessary for the rebuilding plan.[4] Amendment 9 required the use of Bycatch Reduction Devices (BRDs) in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ.[5] East of Cape San Bal was exempt at the time due to low abundance of red snapper in this area, and state waters were not considered a factor because it was determined		

	that juvenile red snapper typically occur beyond depths of 5 fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms.[6] The BRD certification criteria were changed by an August 2006 Regulatory Amendment to require that total finfish reduction be reduced by 30% with no specific red snapper requirement.[7] In 2007, Amendment 14 (effective in 2008) established a specific red snapper bycatch reduction target for the shrimp fishery and designated seasonal closure restrictions that could be used to manage shrimp fishing effort in relation to the target bycatch reduction goal.[8] If it is determined that a seasonal closure is necessary, then the Regional Administrator will set the closed season area and duration as necessary to meet the bycatch reduction target. Bycatch reduction target for juvenile red snapper in the shrimp fishery have been meet and exceeded through use of BRDs and significant reductions in shrimp effort.[9] - High incidental catch of finfish and shellfish has also created conflicts between shrimpers and the northern Gulf of Mexico groundfish fishery that may utilize species discarded by the shrimp fishery. Juvenile groundfish and other species are typically not retained by shrimpers because there is low economic value for them and retaining them would reduce available space for retaining shrimp catch. Regulations developed to reduce bycatch including required BRDs have significantly decreased bycatch of finfish within the shrimp fishery and additional actions, including effort reductions and seasonal closures (if needed) have also helped in reducing bycatch.[10,11] - Gear conflicts between shrimpers and stone crab fishermen. The GMFMC shrimp FMP directly addresses conflicts between the shrimp and stone crab fisheries and established five zones within the EEZ to separate shrimp trawling and stone crab trap activity.[12] - Gear conflicts also occur in state waters between shrimpers and blue crab fishermen. Each of the five Gulf states, including Texas, has established trap identification and visibility requirements, restrictions on harvest hours, seasonal and area closures and derelict trap removal programs that all serve to reduce interactions between shrimp traps and crab traps.[13,14,15]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[3] Tex. Parks and Wild. Code § 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

[4] "Red Snapper" *FishWatch*. Web. Accessed June 2015. http://www.fishwatch.gov/seafood_profiles/species/snapper/species_pages/red_snapper.htm

[5] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[6] Nichols, Scott. *The spatial and temporal distribution of the bycatch of red snapper by the shrimp fishery in the offshore waters of the US Gulf of Mexico*. Pascagoula, Mississippi: National Marine Fisheries Service, Mississippi Laboratories, 1990.

[7] GMFMC. *A Framework Measures to Address the Bycatch Reduction Criterion for Shrimp Trawls in the Gulf of Mexico West of Cape San Blas, Florida Under the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico*. 2006
http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/shrimp/archives/shrimp_reg_amend_aug_2006.pdf

[8] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.
http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[9] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[10] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[11] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[12] GMFMC. *Amendment 3 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1984. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-03%20Final%201982-10.pdf

[13] 31 Tex. Admin. Code § 57.973
http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=57&rl=973

[14] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015).
http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[15] Derelict Trap Task Force. 2008. Guidelines for Developing Derelict Trap Removal Programs in the Gulf of Mexico. Gulf States Marine Fisheries Commission. Ocean Springs, MS.
http://www.gsmfc.org/publications/GSMFC%20Number%20154.pdf

8.5 Fishing gear selectivity

8.5.1 (a) Where practicable, is there a requirement that fishing gear, methods and practices are sufficiently selective as to minimize waste, discards, catch of non-target species - both fish and non-fish species - and impacts on associated or dependent species and that the intent of related regulations is not circumvented by technical devices and that information on new developments and requirements is made available to all fishers? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	The primary gear type in the Texas commercial shrimp fishery is the otter trawls.[1,2] There are two overarching considerations for the Texas shrimp fishery with regard to gear selectivity and environmental impacts: bycatch and bottom habitat impacts.	

	Fishermen and managers in the Gulf of Mexico work collaboratively on innovative gear modifications to reduce impacts. TEDs are required in otter trawls in state and federal waters by federal regulations.[3,4] The use of BRDs is required in federal waters and state waters.[5,6] Substantial progress has been made in minimizing bycatch and impacts to the ecosystem by the Texas shrimp fishery; however, some areas for potential improvements remain.[7] Refer to the response to 7.2.2 (g)(iii) for full details on gear selectivity for each allowable gear type.	

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[3] 31 T.A.C. §58.160 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

[4] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[5] 31 T.A.C. §58.160 http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=58&rl=160

[6] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[7] National Marine Fisheries Service. 2013. *U.S. National Bycatch Report First Edition Update 1* [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. http://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

(8.5.1 (a) cont.)

- Are regulatory measures being circumvented by technical devices?

Yes...[0] **Some...**[½] **No...**[1]

Extent of compliance		
No	**Some**	**Yes**
Federal: Section 311 of the MSA authorizes NOAA enforcement and USCG agents to "*board, and search or inspect, any fishing vessel which is subject to the provisions of this Act"* with or without a warrant.[1] Both the USCG and NOAA Office of Law Enforcement actively monitor and enforce all federal fishing regulations including inspections to ensure proper use of gear such as TEDs and BRDs.[2,3] TED compliance is a particular focus for enforcement officers and TED compliance reports are compiled and analyzed quarterly to ensure that the fishery continues to meet minimum compliance required by the ESA.[4] Penalties for TED violations are based on the level of violation (Level 1=minor, Level 4=most severe) and penalties can be severe, ranging from a few hundred dollars to several thousand, forfeiture of catch and possible jail time. Additionally, authorization for the continued operation of the Gulf of Mexico		

shrimp fishery is based on maintaining compliance with TED regulations and the fishery can be close for a period of 30 days if TED compliance drops below the threshold of minimum compliance for two consecutive quarters.[5] These policies typically deter fishermen from circumventing regulatory measures. **Texas:** TPWD Game Wardens conduct on water and dockside inspections and respond to reports of violations, issuing citations for any violation of gear regulations.[6,7] Texas Game Wardens have authorization under the Texas Parks and Wildlife Code to inspect any person or vessel engaged in an activity governed by the Parks and Wildlife Code and routinely do inspections of licenses, permits, tags, and gear to ensure that only legal devices are in use.[8] Game wardens conduct over 100,000 hours of boat patrols and log over 3 million interactions a year.[9]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[5] NOAA Fisheries. *Turtle Excluder Device (TED) Compliance Policy*. Draft May 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/ted_compliance_policy.pdf

[6] "Texas Game Wardens" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/warden/

[7] TPWD. "Law Enforcement Report. Crab Violations 2010 – Present" Unpublished Report. September 2014.

[8] "Inspection Authority" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/laws-penalties-restitution

[9] Texas Parks and Wildlife Department. *2008 Annual Report* (TPWD, 2009). http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_e0100_003_01_09.pdf

8.5.1 (b) Are fishers cooperating in the development of selective fishing gear and methods?
Yes...[1] **Sometimes...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA Fisheries SERO Cooperative Research Program (CRP) is a competitive Federal assistance program that funds projects seeking to increase and improve the working relationship between researchers from NOAA Fisheries, state fishery agencies, universities, and fishermen. The CRP has as its principal goal to provide a		

means of involving commercial and recreational fishermen in the collection of fundamental fisheries information to support the development and evaluation of management and regulatory options. Past research projects have included gear testing for BRDs and TEDs with commercial shrimp industry participants.[2] NOAA SEFSC Harvesting Systems Unit often collaborates with commercial fishermen on research of new gear designs.[3] Texas Sea Grant has also been active in research of various gear designs including TEDs, BRDs and trawl door fuel efficiency testing with fishermen and captains across the Gulf of Mexico.[4] The Gulf and South Atlantic Fisheries Foundation (GSAFF) is a private, regional nonprofit research and development organization focused on the development of commercial fisheries in the South Atlantic and Gulf of Mexico.[5] The foundation has been actively working with commercial fishermen for at least 30 years conducting cooperative research and hosting workshops and training opportunities. Efforts focused on in TED and BRD research and development and gear outreach have been deemed successful by NMFS and the Foundation.[6,7]		

[1] "Cooperative Research Program (CRP)" *NOAA Fisheries Southeast Regional Office*. Web. Accessed September 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/state_federal_liaison_branch/crp/index.html

[2] NOAA Fisheries, Southeast Regional Office. *Cooperative Research Program Award Status Report.* 2013. http://sero.nmfs.noaa.gov/operations_management_information_services/state_federal_liaison_branch/documents/2013_crp_annual_report.pdf

[3] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[4] *Texas Sea Grant*. Web. Accessed November 2015. http://texasseagrant.org/staff/gary-graham/

[5] "Research" *Gulf and South Atlantic Fisheries Foundation*. Web. Accessed November 2015. http://www.gulfsouthfoundation.org/research/

[6] GSAFF. *Gulf and South Atlantic News, Volume 16*, Issue (May 2015) http://gulfsouth.ehclients.com/uploads/newsletters/5_15newsletter_short.pdf

[7] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. *An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry*. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

8.5.2 Do regulations governing the selectivity of fishing gear take into account the range of fishing gear, methods and strategies available to the industry? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Federal regulations allow for several gear types in the Gulf of Mexico shrimp		

fishery, including otter trawl, butterfly net, skimmer trawl and cast net.[1] Regulations concerning TED use are specific to gear type in order to accommodate differences in design and use.[2] NOAA SEFSC Harvesting Systems Unit continues to research new designs for TEDs and BRDs specific to each gear type in efforts to further improve bycatch reduction and frequently tests and certifies new designs requested by industry members to expand the available options for BRDs.[3] **Texas:** Similarly, TPWD allows for select gear types within the inshore shrimp fishery including different net configurations of otter trawls, beam trawls, and cast nets. Gear regulations and restrictions are specific to gear type including closure areas for certain gears and size restrictions on trawl nets.[4]		

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[3] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

8.5.3 Are States and relevant institutions involved in the fishery collaborating in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA SEFSC Pascagoula Lab 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 bycatch reduction devices 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 TEDs and BRDs.[1] Harvesting Systems Unit also contains a Gear Monitoring Team (GMT) dedicated to outreach and education on TED and BRD regulations and use. The GMT conduct courtesy inspections of TEDs and BRDs installed on shrimp boats during dock visits, workshops and upon request to ensure that these devices are properly used.[2] The GMT travels to all five Gulf states to ensure technology transfer; additionally, the Harvesting Systems Unit is responsible for technology transfer of TEDs internationally and conducts trainings and inspections of shrimp fleets throughout the world.[3] NOAA developed a standard TED enforcement boarding form, which is used by each state agency, NOAA enforcement and USCG to inspect TEDs.[4] The August 2006 Regulatory Amendment of the shrimp FMP standardizes the requirements for certification of BRDs.[5]		

[1] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[2] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[3] 'Shrimp Import Legislation for Sea Turtle Conservation" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/turtles/shrimp.htm

[4] MDMR Shrimp and Crab Bureau. *Shrimping the Sound*. Spring 2014. Newsletter http://dmr.ms.gov/images/publications/newsletters/Shrimp-Spring-2014.pdf

[5] GMFMC. *A Framework Measures to Address the Bycatch Reduction Criterion for Shrimp Trawls in the Gulf of Mexico West of Cape San Blas, Florida Under the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico*. 2006. http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/shrimp/archives/shrimp_reg_amend_aug_2006.pdf

8.5.4 Is cooperation being encouraged with respect to research program for fishing gear selectivity and fishing methods and strategies, dissemination of the results of such research programs and the transfer of technology? **Yes...**[1] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA SERO disseminates information and results of research through the Southeast Fishery Bulletin.[1] NOAA, in addition to being responsible for enforcement of TEDs, also has a GMT dedicated to outreach and education on TED regulations. The GMT may conduct targeted to areas of non-compliance based on boarding records.[2] The GMT coordinator's contact information is also published on NOAA's Southeast Fisheries Science Center's website and he can be contacted directly to do dockside inspections with no penalty attached prior to a vessel's departure.[3] Texas Sea Grant at Texas A&M University maintains a Fisheries Assistance Program that addresses fisher needs and education based on current priorities in Texas.[4] Texas Sea Grant has been active in training fishermen and captains across the Gulf of Mexico. In 2014, as part of a grant from the National Fish and Wildlife Foundation, a marine extension agent and a marine fisheries specialist traveled to conduct dockside inspections, reaching 500 captains and crewmembers.[5] The GASFF has also been active hosting workshops for commercial fishermen for at least 30 years. Efforts focused on in TED and BRD research and development and gear outreach have been deemed successful by NMFS and the Foundation.[6] The most recent outreach efforts by the Foundation were from 2011-2013. In that time period, the Regional Coordinators for the project traveled to 8 States in the Gulf and South Atlantic, visiting 74 cities. Regional Coordinators disseminated TED and BRD instruction manuals in English, Spanish, and Vietnamese.		

[1] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[2] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[3] "Sea Turtle Staff" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/turtles/staff.htm

[4] "Fisheries Assistance Program" *Sea Grant Texas at Texas A&M University*. Web. Accessed June 2015. http://texas-sea-grant.tamu.edu/OurPrograms/FisheriesAssistance.html

[5] "Sea Grant Education Network" *Sea Grant Texas at Texas A&M University*. Web. Accessed June 2015. http://www.seagranted.net/index.php

[6] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

Article 10 - Integration of Fisheries into Coastal Area Management

10.1 Institutional framework

10.1.1 Has an appropriate policy, legal and institutional framework been adopted in order to achieve sustainable and integrated use of living marine resources, taking into account the fragility of coastal ecosystems and the finite nature of their natural resources and the needs of coastal communities?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Coastal Coordination Act of 1991 (CCA) declared it the policy of the state of Texas "to make more effective and efficient use of public funds and provide for more effective and efficient management of coastal natural resource areas to better serve the people of Texas."[1] These objectives are to be carried out by continual review of primary coastal problems, coordination of government programs affecting coastal natural resource areas, coordination of efforts required to resolve identified coastal problems, and providing more transparency, accessibility, and accountability of all coastal management processes. The CCA initially required the development of a Coastal Coordination Council.[2] In 2010, based on the recommendations of a Texas Sunset Review of the Coastal Management Program (CMP) the council was abolished and its duties transferred to the Commissioner of the GLO along with the establishment of a Coastal Coordination Advisory Council (CCAC) (done in consistency with federal CZMP requirements). The CCAC consists of the commissioner, representatives from local government, local business, agriculture, local citizens, the Texas State Soil and Water Conservation Board, Texas Railroad Commission (RRC), TWDB, Texas Transportation Board, TCEQ, Texas Sea Grant Program, and TWPC. The Texas CMP is a NOAA-funded program managed through the Texas GLO.[3] This		

federally-approved program provides federal funding through the Coastal Zone Management Act (CMZA) for the implementation of projects and program activities by state and local entities. The CMP was finalized in 1997, approved by NOAA, and accepted into the federal CZMP. The CMP designates Coastal Natural Resource Areas (CNRAs) to ensure long-term ecological and economic productivity. The CMP also developed Coastal Issues Teams (CIT) to increase interagency coordination and communication. Projects funded through the CMP include: Coastal Natural Hazards Response, Critical Areas Enhancement, Public Access, Waterfront Revitalization and Ecotourism Development, Permitting Assistance, Government Coordination and Planning Assistance, Water Sediment Quantity and Quality Improvements. The program allows for consistency review at both the state and federal level and encourages public participation through public comment opportunities posted in the *Texas Register* and through the GLO website.[4] The NOAA Office of Ocean and Coastal Resources manages the CZMP and monitors the Texas CMZ through annual reporting of standardized performance indicators.[5,6]

In addition to the CMP, Texas also has a Coastal Impact Assistance Program (CIAP) which is a federal funded program administered by USFWS and Texas GLO.[7] CIAP utilizes the royalties from offshore oil and gas leases to fund remediation projects addressing impacts from the oil and gas industry. These funds go to conservation and/or restoration of coastal areas, mitigation of damage to fish, wildlife, or natural resources and implementation of federally approved coastal management plans.

The Texas GLO also created the Coastal Texas 2020 initiative to develop a long-term state-wide initiative to unite local, state and federal efforts to promote economic and environmental health of the Texas coast.[8] The Coastal Texas 2020 initiative was launched in 2003 and included a series of public meetings to comment on coastal issues, and creation of regional advisory councils for five regions of Texas coast (containing representatives from state and local government, academic, natural resources agencies, non-governmental organizations or NGOs, and public) to develop a series of recommendations that were sent to a Technical Advisory Committee. The goal of this program is to leverage and maximize funding from CMP, U.S. Army Corp of Engineers (USACE) projects and CEPRA funds towards areas of most concern, as identified by public comment and regional advisory councils and developed into a 15 year plan released in 2005.

The Coastal and Estuarine Land Conservation program (CELCP) was created through an act of US Congress (Public Law 107-77) "for the purpose of protecting important coastal and estuarine areas that are threatened by conversion."[9] In 2005, Texas developed a state plan under this program to be incorporated into the Texas CMP. Representatives from GLO's CMP, TPWD and Mission-Aransas National Estuarine Research Reserve (NERR) assisted in the development of the plan and included public meeting and comment period for review.

USACE Galveston District provides essential engineering services that strengthen national security and reduce risks from disaster.[10] The USACE- Galveston District plays a role in managing the projects along the Texas coastline to protect valuable

resources. These projects include stabilization of barrier island shorelines, restoration and protection of coastal habitats, hurricane and storm protection, navigation, beneficial use, sea grass protection, oyster reef management, Texas water supply, wetlands and coastal ecosystems, sedimentation management plans, threatened and endangered species, and Texas ports.

In partnership with the EPA, the Gulf of Mexico Foundation, and the other four Gulf State, Texas also participates in the Gulf Ecological Management Site (GEMS) Program.[11] This program "provides a regional framework for focusing attention on areas of special ecological significance to fish, wildlife, and other natural resources and furthers conservation efforts through inter-agency coordination and targeting of research, monitoring and action projects." There are 24 sites identified as GEMS in Texas.[12]

The National Estuarine Research Reserve Program (NERR) and the NWRS are two federal programs that provide areas of habitat and wildlife protection and opportunities for research and monitoring.[13,14] Texas currently has one federally approved NERR and five National Wildlife Refuges. Padre Island National Seashore is the one coastal area in Texas designated by the National Park Service. [15]

State Methodology for Determination of Needs in the Major Estuaries of Texas is a program jointly established and maintained by TWDB, TPWD, and TCEQ for data collection and "analytical study focused on determining the effects of and needs for freshwater inflows to the state's bays and estuaries." [16] Management goals of the State Methodology (determined by legislative directives) include "1.) ensuring maintenance and productivity of economically important and ecologically characteristic sport or commercial fish and shellfish, and 2.) ensuring the maintenance of estuarine life upon which such fish and shellfish are dependent." This is done through the development of the Texas Estuarine Mathematical Programming (TxEMP) optimization model.[17]

Within TPWD several programs exist to address specific coastal management needs:

- TPWD maintains 47 Wildlife Management Areas (WMA) that provide opportunities for public education of natural resources. [18] 47 WMAs exists which represent habitats and wildlife populations typical of each ecological region of Texas. TPWD prepares management plans for WMAs to develop and manage wildlife habitats and populations, to provide a site for research of wildlife, to provide areas to demonstrate habitat development and wildlife management practices to the public, and to provide natural environmental for use by educational groups, naturalists and professional biological investigators.
- TPWD's Texas Wetlands Management Program conducts numerous wetland habitat projects in conjunction with USFWS and other agencies.[19] Under the Emergency Wetlands Resources Act of 1986, USFWS is required to conduct studies on the status and trends of wetlands in the U.S. and provide reports every decade to Congress.
- TPWD Seagrass Protection Program was fully instituted in all Texas coastal waters in 2013, making it illegal to "cause or allow any rooted seagrass plant to

be uprooted or dug out from the bay or saltwater bottom by a submerged propeller within the coastal waters of the state of Texas." [20] - TPWD WRD reviews, assesses and responds to a variety of water quality issues and ensures that fish, wildlife and aquatic resources are considered during water quality planning at both the state and federal level.[21] - ERP addresses environmental and habitat needs related to coastal resources including management of freshwater inflow, wetlands and seagrasses. [22] TCEQ is charged with environmental management to ensure clean air, clean water and proper management of waste.[23] It is the agency responsible for emergency response to spills of hazardous materials and coordinates cleanups and remediation projects, pollution prevention programs, and permitting for activities that have potential environmental impacts.		

[1] Tex. Nat. Res. Code §33.202 http://codes.lp.findlaw.com/txstatutes/NR/2/C/33/F/33.202

[2] Texas General Land Office, *Texas Coastal Management Program Routine Program Changes from January 1,1997 to December 1, 2011*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_documents/grants-funding/cmp/2013-texas-coastal-management-change-submission.pdf

[3] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[4] Texas General Land Office. Web. Accessed June 2015. http://www.glo.texas.gov/index.html

[5] "Ocean and Coastal Management in Texas" *NOAA Office of Coastal and Ocean Resource Management*. Web. Accessed June 2015. http://coastalmanagement.noaa.gov/mystate/tx.html

[6] "Coastal Management Program" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/grants-funding/cmp/

[7] "Coastal Impact Assistance Program" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/grants-funding/ciap/index.html

[8] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

[9] Texas General Land Office, *Texas Coastal and Estuarine Land Conservation Program Plan* Austin, TX, 2010. http://coastalmanagement.noaa.gov/mystate/docs/celclplantx.pdf

[10] "Galveston District – mission" *U.S. Army Corps of Engineers*. Web. Accessed June 2015. http://www.swg.usace.army.mil/Missions/TexasCoastValuetotheNation.aspx

[11] "Gulf Ecological Management Sites Program" *Environmental Protection Agency*. Web. Accessed June 2015. http://www.epa.gov/gmpo/gem2.html

[12] "Texas GEMS" *Environmental Protection Agency*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/txgems/

[13] "National Estuarine Research Reserve System" *NOAA Office of Coastal Management*. Web. Accessed June 2015. http://www.nerrs.noaa.gov/

[14] *National Wildlife Refuge System*. Web. Accessed June 2015. http://www.fws.gov/refuges/

[15] "Padre Island National Seashore" *U.S. National Park Service*. Web. Accessed June 2015. http://www.nps.gov/pais/index.htm

[16] "Freshwater Inflow Needs of Texas Estuaries" *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/surfacewater/flows/freshwater/index.asp

[17] Texas Water Department Board. "State Methodology for Determination of Needs in the Major Estuaries of Texas" Austin, TX March 2013. http://www.twdb.texas.gov/surfacewater/flows/freshwater/doc/State_Methodology.pdf

[18] "Wildlife Management Areas of Texas" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/huntwild/hunt/wma/

[19] "Wetland Conservation and Management for the Texas" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/huntwild/wild/wetlands/central-coast/

[20] "Seagrass" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/habitats/seagrass/

[21] "Water Quality" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/

[22] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[23] *Texas Commission on Environmental Quality*. Web. Accessed June 2015. http://www.tceq.state.tx.us/

10.1.2 In view of the multiple uses of the coastal area, are representatives of the fisheries sector and fishing communities consulted in the decision-making processes involved in other activities related to coastal area management planning and development? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
CCAC includes representatives from TPWC, as the management agency for fisheries resources, and representatives from local government, local business and the Texas Sea Grant Program.[1] The Coastal Texas 2020 Program included a series of public meetings and advisory councils that included public participation in determining coastal management needs allowing for input directly from the fisheries sector and fishing communities.[2] The State Methodology directly addresses fisheries as a part of the model for determining management of freshwater resources in the state of Texas.[3] TPWD represents the interests of the fisheries sector and fishing communities have input into TPWD decision making through advisory committees such as the CRAC and through public hearings and public comment periods.		

The CRAC maintained by TPWD allows ongoing opportunities for members of fishing and coastal communities to participate in the decision-making process.[4]		

[1] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[2] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

[3] Texas Water Department Board. "State Methodology for Determination of Needs in the Major Estuaries of Texas" Austin, TX March 2013. http://www.twdb.texas.gov/surfacewater/flows/freshwater/doc/State_Methodology.pdf

[4] 31 T.A.C. §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

10.1.3 Do institutional and legal frameworks regulating the possible uses of coastal resources and their access take into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development? **Yes...**[1] **Partly...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The development of the CMP and the Coastal Texas 2020 Program involved public comment and participation in the decision making process regarding coastal management.[1,2] Advisory committees include representatives from coastal fishing communities.[3] Texas law also provides for public access to shorelines though the Texas Open Beaches Act, ensuring access to coastal natural resources. [4,5]		

[1] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[2] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

[3] 31 T.A.C. §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

[4] "Open Beaches" *Texas General Land Office*. Web. Accessed June 2015 http://www.glo.texas.gov/coast/coastal-management/open-beaches/index.html

[5] Tex. Nat. Res. Code § 61 http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.61.htm

10.1.4 (a)(i) Has the adoption of fisheries practices been promoted that avoids conflict among bottom resource users? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Both the GMFMC Shrimp FMP and the Texas Shrimp FMP address user conflicts		

associated with the Texas shrimp fishery. Refer to 7.6.5 for details on identified user conflicts and actions taken to reduce conflict.		

10.1.4 (a)(ii) - bottom resource users and other users of the coastal area?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The primary conflicts between shrimpers and other resource users, besides the fisheries conflicts addressed in 7.6.5, are conflicts with environmental groups concerned with incidental take of sea turtles. Requirements for Turtle Excluder Devices (TEDs), and guidelines on proper handling, resuscitation and release of sea turtles have significantly reduced sea turtle mortality in the Gulf of Mexico shrimp fishery.[1,2,3] Texas has also mandated the use of TEDs in trawls at the state level and does not allow the use of skimmer trawls in state waters.[4] Additionally, the shrimp industry, federal and state agencies have also been active in other conservation efforts to aid the recovery of sea turtle populations including head-start programs to raise hatchling sea turtles in captivity for later release, nest protection programs in Texas and Mexico, and education programs to raise awareness among user groups regarding sea turtle conservation actions.[5,6] In Texas, shrimp trawling is prohibited within nursery areas including tributary bays, inlets, bayous, lakes and rivers.[7] This regulation reduces conflicts in nearshore areas and protects sensitive habitat areas. In addition to the items in the above response, TPWC created a Coastal User Working Group (CUWG) that met several times in 2012 and produced a report with recommendations on developing seagrass protection and reducing user conflict in Texas coastal areas.[8] The CUWG consisted of 19 representatives from fishing, boating, guiding, birding, paddling, airboating, conservation interest groups, and TPWD law enforcement. In the final report, nine recommendations were made for seagrass protection and five for reducing user conflict. The highest priority recommendation was for the state of Texas to develop a statewide regulation protecting seagrass. The remaining eight seagrass recommendations include: - Production of detailed maps depicting seagrass areas, particularly those susceptible to boat damage - Development of tide indicators - Creation of a local knowledge website containing information on tides, rookery info, water reading tips, maps, fishing reports, etc. - Implementation of run lanes in areas to concentrate impacts - Coordination with other agencies including USACE, TCEQ, GLO, TXDOT, commercial fishermen, and oil and gas industry on seagrass conservation - Engage boat owners, retailers, dealers and distributors in regards to seagrass protection and boater ethics		

- Engage boat manufacturers, owners, retailers, dealers and distributors to discuss responsible marketing of boats The five recommendations for reducing user conflicts included development of a user code of ethics, lowering the minimum age required for boater education, work with other agencies to allow for more effective signage, create an awareness campaign to address user conflict and require paddlecraft registration. Based on these recommendations, TPWD developed a seagrass conservation plan for Texas, launched a public awareness campaign and statewide seagrass protection regulations went into effect in 2013.[9] The development of the CMP and the Coastal Texas 2020 Program also involved public comment and participation in the decision making process regarding coastal management.[10,11] Advisory committees include representatives from coastal communities.[12]		

[1] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[2] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[3] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[4] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.47. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[7] Tex. Parks and Wild. Code § 77 http://www.statutes.legis.state.tx.us/docs/PW/htm/PW.77.htm

[8] Coastal User Working Group. *Final Report*. September 2012. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/coastal_user_working_group_report.pdf

[9] Texas Parks and Wildlife Department. *Seagrass Conservation Plan for Texas*. Austin, TX 1999. https://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_r0400_0041.pdf

[10] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[11] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

[12] 31 T.A.C. §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

10.1.4 (b) Have procedures and mechanisms been adopted which help settle these conflicts?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The TPWD process allows for advisory committees (such as the CRAC) through Title 31 of the Texas Administrative Code which provides a forum to address user conflicts.[1,2] Public hearings, testimony at commission meetings and written comment through the website are also avenues available voice user conflict issues and these are considered in management decision-making processes. to address user conflicts as they arise. The CMP also requires consultation and coordination between various user groups in developing consistent management practices.[3]		

[1] 31 Tex. Admin. Code §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

[2] 31 Tex. Admin. Code §51.601 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=9&p_dir=N&p_rloc=118620&p_tloc=&p_ploc=1&pg=6&p_tac=&ti=31&pt=2&ch=51&rl=500

[3] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

10.2 Policy measures

10.2.1 Is public awareness being created on the need for the protection and management of coastal resources and the participation in the management process by those affected?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
TPWD publicizes public hearings, scoping meetings, comment periods for proposed management actions and encourages public participation through these outlets as well as through advisory committees for specific issues (CUWG, CRAC).[1,2,3] The GLO also publicizes public hearings and scoping meetings and coordinated regional advisory committees to assist in the development of the CMP and Coastal 2020 programs.[4,5,6] Aside from these outlets of engagement in the decision-making process, there are numerous initiatives for public awareness regarding protection and management of Coastal Resources: • TPWD's Outdoor Learning Program includes a wide variety of activities, programs, courses, and volunteer opportunities to create public awareness and encourage participation in coastal management.[7,8] Several facilities are dedicated to coastal resource education: Sea Center Texas, and WMAs.[9,10]		

TPWD also disseminates information through social media campaigns, and through the Passport to Texas daily radio show and Texas Parks & Wildlife Television Program.[11,12] There are also specific fishery education programs and promotions and drought education.[13,14] • The GLO Caring for our Coast webpage provides information on various coastal issues and their Education and Outreach program.[15,16] Several projects through the CMP also include public education and outreach components.[17] • NERR provides a 'living classroom' for education on estuaries and coastal resources.[18] The Mission-Aransas NERR Education program includes K-12 education, teacher training programs, and general public outreach at the Wetlands Education Center and Visitor Center.[19] • The Texas Sea Grant Program offers informal science education through seminars, workshops, publications and a Floating Classroom Program which target various audiences including students, educators and the general public.[20] Texas Sea Grant also coordinates the National Ocean Sciences Bowl to encourage high school students to engage in ocean sciences. There are also numerous NGOs in Texas and across the Gulf of Mexico addressing coastal resource awareness, restoration and protection.		

[1] "TPW Commission Meetings" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. https://tpwd.texas.gov/business/feedback/meetings/

[2] Coastal User Working Group. *Final Report*. September 2012. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/coastal_user_working_group_report.pdf

[3] 31 T.A.C. §51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

[4] *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/GLO/public-notices/index.html

[5] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[6] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

[7] "Education" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/learning/

[8] "Volunteer for Texas Parks and Wildlife Department" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. https://ec.volunteernow.com/recruiter/index.php?class=VolunteerNavigation&recruiterID=1353&act=CONTROL:OPP_SEARCH_LINK

[9] "Sea Center Texas" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/spdest/visitorcenters/seacenter/

[10] "Wildlife Management Areas of Texas" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/huntwild/hunt/wma/

[11] "Social Media" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/socialmedia/

[12] "News and Media" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/newsmedia/

[13] "Fisheries Programs and Promotions" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/fishboat/fish/programs/

[14] "The State of the Water" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.texasthestateofwater.org/

[15] "Caring for the Coast" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/

[16] "Education and Outreach Program" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/education-outreach/index.html

[17] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[18] "National Estuarine Research Reserve System" *NOAA Office of Coastal Management*. Web. Accessed June 2015. http://www.nerrs.noaa.gov/

[19] "Mission- Aransas NERR" *NOAA Office of Coastal Management*. Web. Accessed June 15. http://nerrs.noaa.gov/reserves/mission-aransas.html

[20] "Sea Grant Education Network" *Sea Grant Texas at Texas A&M University*. Web. Accessed June 2015. http://www.seagranted.net/index.php

10.2.2 Has an attempt been made to assess the economic, social and cultural value of coastal resources in order to assist decision-making on their allocation and use?

(i) - economic **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
REGIONAL: GSMFC, a research and information-sharing network consisting of the five Gulf states, has conducted socioeconomic research on the baseline of seafood dealers and processors in each of the Gulf States, including overall workforce satisfaction.[1,2] The GSMFC Economics program also produced economics surveys of the inshore shrimp fisheries.[3,4] NOAA conducts research on the demographics and economies of coastal communities, including housing an index of the total economy of coastal areas.[5,6] The National Ocean Economics Program (NOEP), sponsored by NOAA, provides current policy-relevant economic and demographic information on changes and		

trends along the U.S. coast and coastal waters.[7]

Gulffishinfo.gov (FINFO), a program of GSMFC, also collects and makes public information about the economic status of Gulf of Mexico fisheries.[8]

TEXAS:

The Office of the Texas Comptroller of Public Accounts is primary steward of state finances and is responsible for conducting economic examinations of various industries and regions within the state.[9] A series of reports called Texas in Focus, examines and analyses the economic status of 13 regions across Texas. *The Texas In Focus: Gulf Coast Report* completed in 2010 includes demographic, infrastructure and economic development areas for the coast and includes industry profiles.[10]

The *Coastal Texas 2020* report, developed by the GLO, also includes information on the economic value of the Texas Gulf Coast.[11] The GLO brochure, *The Texas Coast: Shoring Up for Our Future*, also summarizes the economic value of coastal Texas.[12]

The coastal resources of Texas are vital to the state's economy. The nation's largest concentration of oil refineries and the leading chemical industry, ranked first in both size and production, are based on the Texas coast. Galveston Bay supports the Houston metropolitan area, which is one of the largest metropolitan areas in the United States and is known as the energy capital of the world. With 367 miles of coastline and over 3,000 miles of bay shores, the Texas coast supports important commercial fisheries and recreational activities. Commercial fisheries in Texas bring in more than $170 million of fish and shellfish annually. Over 2/3rds of Texas coastline is protected in parks, wildlife refuges and nature areas; attracted by beaches, birding, history, fishing and a mild climate, the tourism industry brings in more than $7.5 billion annually in Texas' coastal counties. Galveston is now also a major cruise ship port and the cruise ship industry brings in more than $445 million dollars a year to the Texas economy. Seaports and seaborne trade are also major components of the Texas coastal economy. Based on cargo tonnage, Texas coast is home to three of the nation's top ten ports.

[1] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[2] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[3] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[4] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[5] "Social Science Research Group" NOAA Southeast Fisheries Sciences Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[6] *NOAA's State of the Coast*. Web. Accessed November 2015. http://stateofthecoast.noaa.gov/economy.html

[7] *National Ocean Economics Program*. Web. Accessed November 2015. http://www.oceaneconomics.org/About/overview.aspx

[8] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Gulf-Fisheries-Economics

[9] *Office of the Texas Comptroller of Public Accounts*. Web. Accessed June 2015. http://comptroller.texas.gov/specialrpt/tif/gulf/index.html

[10] Susan Combs. *Texas In Focus: Gulf Coast Region*. Office of the Texas Comptroller of Public Accounts, 2010. http://comptroller.texas.gov/specialrpt/tif/gulf/GulfCoastFullReport.pdf

[11] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

[12] Texas General Land Office. *The Texas Coast: Shoring Up for Our Future*. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_documents/grant-project/12-587-overview-rpt.pdf

10.2.2 (ii) - social and cultural **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA conducted research in 2005 to identify communities associated with the fishing industry in coastal Texas to assist in management of resources by identifying areas of economic and social dependence on the resource. This report provides profiles of 67 communities along the Texas coast including a brief cultural geographic description, earnings by industry, population demographics, and fishing infrastructure and activities for each community. Results indicate that fishing is a primary local economy in 27 communities: Fulton, Rockport, Freeport, Port Lavaca, Port O'Connor, Seadrift, Brownsville, Port Isabel, South Padre Island, Oak Island, Bacliff, Crystal beach, Dickinson, Galveston, Kennah, Port Bolivar, San Leon, Texas City, Houston, Pasadena, Seabrook, Beaumont, Port Arthur, Palacios, Sargent, Port Aransas, and Aransas Pass; and seven other communities are at least moderately engaged in the fishing industry (Port Mansfield, Victoria, Ingleside, Matagorda, Riviera, Baytown, and Anahuac.)[1] Reports produced by the Office of the Texas Comptroller of Public Accounts, such as the *Texas In Focus: Gulf Coast Report*, and GLO reports, including Coastal Texas 2020 and *The Texas Coast: Shoring Up for Our Future*, also contain demographic information, employment trends and other social and cultural values of the coastal Texas region. The Gulf coast region is one of the most populous areas of Texas with 6.1 million people living in coastal counties.[2] Personal income in the Gulf Coast region exceeded the state average by 24% and employment is dominated by jobs associated with energy and petrochemical industries, tourism and seaborne trade.[3] Historically, early development in Texas was based predominantly around cotton and cattle ranching; however, oil discoveries in the late 1800s and early 1900s led to industrialization of the Texas coast and energy industries have dominated economic		

development of the area. Providing opportunities for contact with nature is an important social and cultural value for Texas and over 2/3rds of the Texas coast is protected in parks, wildlife refuges and nature areas.[4]		

[1] Assessment, Impact. Inc., *Identifying communities associated with the fishing industry in Texas*. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-03-SE-0603. St. Petersburg, FL, 2005 http://www.st.nmfs.noaa.gov/humandimensions/publications/community-profiles-pub/index

[2] Susan Combs. *Texas In Focus: Gulf Coast Region*. Office of the Texas Comptroller of Public Accounts, 2010. http://comptroller.texas.gov/specialrpt/tif/gulf/GulfCoastFullReport.pdf

[3] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

[4] Texas General Land Office. *The Texas Coast: Shoring Up for Our Future*. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_documents/grant-project/12-587-overview-rpt.pdf

10.2.3 Have risks and uncertainties involved in the management of coastal areas been taken into account in setting policies for the management of coastal areas? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Texas CMP contains a comprehensive section on risk assessment and coastal hazards which is constantly under review and update through the CZMA structure.[1] *The Texas CMP Section 309 Assessment and Strategies Report 2011-2015*, section on assessment of coastal hazards details types of hazards, level of risk, geographic scope of risk, potential losses and management strategies that are currently in effect or recommendations for further action.[2] Evaluation of susceptibility, mitigation planning, preparedness, response and recovery are considered for the following coastal hazards: flooding, storm surge, geological hazards, erosion, sea level rise, land subsidence, and tropical storms. The *2011-2015 Assessment and Strategies Report* also addresses threats to wetlands and ranks types of threats, severity and reversibility of each risk.		

[1] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[2] The Harte Research Institute for the Gulf of Mexico Studies, *The Texas Coastal Management Program Section 309 Assessment and Strategies Report 2011-2015*. Prepared for the Texas General Land Office. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_documents/grants-funding/cmp/309-report-2011-2015.pdf

10.2.4 In accordance with capacities, have measures been taken to establish or promote the establishment of systems to monitor the coastal environment as part of the coastal management process using physical, chemical, biological, economic and social parameters?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
There is a network of programs responsible for monitoring the coastal environment		

of Texas. The GLO is responsible for management of the Texas CMP, the Texas Coastal and Ocean Observation Network Overview (TCOON), the Texas Automated Buoy System (TABS) and other coastal monitoring activities.[1] The Texas CMP has specific performance measures designed by NOAA to evaluate the performance of the CZMP and NERR programs.[2] The CMP includes long-term monitoring and data collection of performance measures of both environmental and socioeconomic factors to establish a baseline and identify trends in coastal resources. TCOON is a network of scientific collection platforms, designed to NOAA standards, along the Texas coast that collect data on wind and water.[3] TCOON's main function is monitoring of water level; however, many TCOON stations also monitor wind data, atmospheric pressure and air and water temperature. TCOON was established by GLO in 1991, and is managed cooperatively by GLO, TWDB, USACE, and NOAA. The TWDB provides Tide Forecasts and Hindcasts based on data provided from TCOON.[4] TABS is an offshore buoy network that collects data on surface currents and provides near real-time data to oil spill response agencies to predict spill movements.[5] TWDB also manages or participates in the Texas Coastwide Erosion Plan, the Texas Coastal Watershed Center, and the Texas CELCP which is incorporated into the CMP. [6,7,8,9]

TWDB's Surface WRD handles data collection, research, monitoring and planning for water resources to ensure ecological health and productivity and maintain the availability of water supplies.[10] This division monitors data on reservoirs, streamflow, groundwater, precipitation and evaporation, drought, coastal hydrology, and estuaries. The Surface WRD maintains the Bays and Estuaries Program responsible for monitoring freshwater inflow and the ecological health of these systems.[11] This program develops circulation and salinity models for use in water management and determination of freshwater inflow needs by utilizing streamflow data from USGS stream gauges, diversion and return flow data from TCEQ South Texas Watermaster program, the TWDB Irrigation Water Use Estimates, and biological and ecological data from TPWD. [12,13,14,15]

Meteorological Data on wind speed, direction and air temperature is also collected by the National Climatic Data Center and precipitation data are gathered through the National Weather Service.[16,17]

Economic and social monitoring are an integral part of the Texas CMP and NOAA Center for Sponsored Coastal Ocean Research conducts research on economic and social impacts of both natural and anthropogenic events and influences on coastal communities.[18]

[1] "Coastal Monitoring" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/environmental-protection/coastal-monitoring/index.html

[2] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[3] "Texas Coastal Ocean Observation Network (TCOON)" *Texas A&M University*. Web. Accessed June 2015. http://www.cbi.tamucc.edu/TCOON/

[4] "Tide Forecasts" *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/surfacewater/bays/tides/index.asp

[5] "TABS, Texas automated Buoy System" *Texas A&M University*. Web. Accessed June 2015. http://tabs.gerg.tamu.edu/

[6] "Coastal Erosion" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/coastal-erosion/index.html

[7] K. K. McKenna, *Texas Coastwide Erosion Response Plan, 2009 Update*. Texas General Land Office, 2009. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_documents/coastal-erosion/response-plans/coastwide-erosion-response-plan.pdf

[8] "Texas Coastal Watershed Center" *Texas General Land Office*. Web. Accessed June 2015. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/grants-funding/projects/completed/03-055-coastal-watershed-water-quality.html

[9] Texas General Land Office, *Texas Coastal and Estuarine Land Conservation Program Plan* Austin, TX, 2010. http://coastalmanagement.noaa.gov/mystate/docs/celclplantx.pdf

[10] "Surface Water" *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/surfacewater/index.asp

[11] "Bays and Estuaries" *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/surfacewater/bays/index.asp

[12] "Water Data for the Nation" United States Geologic Survey (USGS). Web. Accessed June 2015. http://waterdata.usgs.gov/nwis/

[13] "South Texas Watermaster Program" *Texas Commission on Environmental Quality*. Web. Accessed June 2015. http://www.tceq.texas.gov/permitting/water_rights/wmaster/stwr/southtexas.html

[14] "Irrigation Water Use Estimates" *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/conservation/agriculture/irrigation/index.asp

[15] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[16] *National Climatic Data Center*. Web. Accessed June 2015. http://www.ncdc.noaa.gov/

[17] *National Weather Service*. Web. Accessed June 2015. http://www.weather.gov/

[18] *Center for Sponsored Coastal Ocean Research.* Web. Accessed June 2015. http://www.cop.noaa.gov/default.aspx

10.2.5 Has multi-disciplinary research in support of coastal area management been promoted on

(i) - environmental and biological aspects? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
In addition to monitoring, most of the above programs listed in 10.2.5 contain		

research activities. The Texas CMP Section 306/306A provides for an annual grant cycle which allows for continued research on coastal issues of priority.[1,2] TWDB Surface WRD conducts research on every major bay system (studies posted publicly on the website for each system).[3] TPWD ERP conducts research on coastal issues including freshwater inflow, seagrasses and wetlands.[4] NERR conducts ongoing research of coastal estuaries. Texas currently has one NERR- the Mission-Aransas NERR[6] that conducts system-wide monitoring and research [5] The GEMS Program is a partnership between federal and state agencies to further coastal conservation through targeted research and monitoring, and development of action plans.[6] Texas currently has 24 sites in the GEMS program.[7,8]		

[1] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[2] Texas Coastal Management Program, "Grant Cycle 19 Project List" http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_documents/grants-funding/cmp/cmp-cycle-19-website-project-information1.pdf

[3] "Surface Water" *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/surfacewater/index.asp

[4] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[5] "National Estuarine Research Reserve System" *NOAA Office of Coastal Management*. Web. Accessed June 2015. http://www.nerrs.noaa.gov/

[6] "Mission- Aransas NERR" *NOAA Office of Coastal Management*. Web. Accessed June 15. http://nerrs.noaa.gov/reserves/mission-aransas.html

[7] "Gulf Ecological Management Sites Program" *Environmental Protection Agency*. Web. Accessed June 2015. http://www.epa.gov/gmpo/gem2.html

[8] "Texas GEMS" *Environmental Protection Agency*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/txgems/

10.2.5 (ii) - economic and social aspects? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Regional: NOAA Center for Sponsored Coastal Ocean Research conducts research on economic and social impacts of both natural and anthropogenic events and		

influences on coastal communities.[1] NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[2] Each year a third of the permit holders are randomly selected for this survey and information is used to assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. GSMFC Fisheries Economic Data Program has conducted economic analyses for the inshore (non-federally-permitted) shrimp fleet in 2008 and 2012.[3,4,5] GSMFC has also conducted socioeconomic research on the baseline of seafood dealers and processors in Texas and other Gulf states, including overall workforce satisfaction and the value of being involved in the seafood sector.[6,7] The GMFMC Shrimp FMP contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a RIR.[8] NOAA Fisheries SERO also conducts socioeconomic research on coastal communities in Texas.[9] In 2005, NOAA produced a report identifying fishing communities in coastal Texas, and currently SERO maintains 'community snapshots' on their website including demographic and economic information on coastal communities.[10,11] **Texas:** In addition to monitoring, most of the programs listed in 10.2.5 contain research activities. The Texas CMP Section 306/306A provides for an annual grant cycle which allows for continued research on coastal issues of priority, including social and economic aspects of coastal use, development and education.[1,2] NOAA Center for Sponsored Coastal Ocean Research conducts research on economic and social impacts of both natural and anthropogenic events and influences on coastal communities.[3] TPWD CRAC as needed to address socioeconomic aspects of issues pertaining to coastal resource use.[4]		

[1] *NOAA Center for Sponsored Coastal Ocean Research*. Web. Accessed November 2015. http://coastalscience.noaa.gov/about/centers/cscor

[2] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[3] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[4] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[5] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[6] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[7] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[8] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[9] "Social Science Research Group" NOAA Southeast Fisheries Sciences Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[10] Assessment, Impact. Inc., *Identifying communities associated with the fishing industry in Texas*. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-03-SE-0603. St. Petersburg, FL, 2005 http://www.st.nmfs.noaa.gov/humandimensions/publications/community-profiles-pub/index

[11] "Snapshots of Human Communities and Fisheries in the Gulf of Mexico and South Atlantic" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/

[12] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[13] Texas Coastal Management Program, "Grant Cycle 19 Project List" http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_documents/grants-funding/cmp/cmp-cycle-19-website-project-information1.pdf

[14] *Center for Sponsored Coastal Ocean Research.* Web. Accessed June 2015. http://www.cop.noaa.gov/default.aspx

[15] 31 Tex. Admin. Code § 51.672 http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=T&app=5&p_dir=N&p_rloc=148630&p_tloc=&p_ploc=1&pg=10&p_tac=148630&ti=31&pt=2&ch=51&rl=671

10.2.5 (iii) - legal and institutional aspects? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Texas CMP utilizes an array of legal and institutional resources and continues to research and incorporate resources form both state and federal programs and agencies.[1] The GLO has researched local, state and federal laws and policies to best utilize the		

resources available for coastal planning, research, restoration and conservation. The Coastal 2020 Initiative addressed planning and funding of coastal projects from all available sources.[2]		

[1] Texas Coastal Management Program. *2012 Annual Report*. Austin, TX, 2013. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/2012-cmp-annual-report.pdf

[2] Texas General Land Office, *Coastal Texas 2020 Executive Summary*. Austin, TX, 2005. http://www.glo.texas.gov/what-we-do/caring-for-the-coast/_publications/coastal-texas-2020.pdf

10.3 Regional cooperation

10.3.1 Do States with neighboring coastal areas cooperate with one another in:

(i) - the sustainable use of resources? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Fisheries Resources in the Gulf of Mexico are managed regionally by GMFMC and/or coordinated through GSMFC.[1,2] The GMFMC is one of the regional Fishery Management Councils established by the Fishery Conservation and Management Act of 1976. The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce. In addition, there are four nonvoting members representing the USCG, USFWS, Department of State, and GSMFC. GMFMC meets five times a year at various locations around the Gulf coast. GMFMC is charged with development of FMPs for all species managed in federal waters and collaborates on management with the five Gulf states. Proposed rule changes are then submitted to NOAA Fisheries for further review and approval before implementation. GMFMC has developed a Shrimp FMP, which was implemented in 1981 and has been updated several times. Once of the stated objectives of the FMP is to "coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible".[3] The Gulf States Marine Fisheries Compact promotes the efficient utilization of fisheries and sound conservation practices through collaboration and data-sharing between states for effective management.[4] Recommendations for potential management actions to ensure the sustainability of resources are included in the regional management plans, though no state is required to implement the recommendations.[5] The US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Gulf of Mexico Initiative (GoMI) was created to assist producers in the five Gulf States by improving water quality and ensuring sustainable		

production.[6] GoMI provides financial assistance and resources to help producers apply sustainable practices and wildlife habitat management. GoMI also works to reduce and control agricultural run-off and decrease use of over-utilized water resources. A series of NRCS programs are available to GoMI including the Environmental Quality Incentives Program, Wildlife Habitat Incentive Program, Wetlands Reserve Program, and Conservation Stewardship Program. There is cooperation between the United States and Mexico regarding fisheries management in the Gulf of Mexico. The United States-Mexico Fisheries Cooperation Program is a bilateral consultative agreement that was informally agreed upon by NMFS and SAGARPA in 1983.[7] Three memoranda of understanding (MOU) have been formalized through this relationship including the MEXUS-Golfo research program. Fishery Cooperation Talks (FCT) between NMFS and CONAPESCA occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles, enforcement cooperation, aquaculture, collaborative research, and participation in fisheries related international organizations.		

[1] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[2] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/

[3] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[4] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[5] Guillory, V. Perry, H. VanderKooy, S. 2001. The Blue Crab Fishery of the Gulf of Mexico, United States: A Regional Management Plan. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20096.pdf

[6] "Gulf of Mexico Initiative (GoMI)" *United States Department of Agriculture (UDSA) Natural Resources Conservation Service*. Web. Accessed November 2015. http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull//?cid=stelprdb1046039

[7] NOAA. 2014. *International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries.* http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

10.3.1 (ii) - the conservation of the environment? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Gulf of Mexico Alliance is a state, federal, and private partnership designed to enhance regional cooperation in the Gulf of Mexico in order to advance the environmental and economic health of the Gulf.[1] The Alliance serves as a forum for shared knowledge and reduces duplication of effort by encouraging collaboration. The Alliance's main focuses until 2014 include water quality, nutrient		

reduction, ecosystem assessment, coastal community resilience and habitat conservation and restoration. In 2014 the Alliance restructured, and moving forward will be focused on water resources, habitat, community resilience, data and monitoring, wildlife and fisheries, and education and engagement. The EPA Gulf of Mexico Program also works regionally in the Gulf with all five states to enhance community resilience, protect coastal habitat and ecosystems, and improve water quality.[2] The NERR system provides an opportunity for collaboration and shared research knowledge between NERR sites across the Gulf of Mexico. There are also numerous NGOs working to address regional conservation concerns within the Gulf of Mexico.[3] International cooperation occurs between the United States and Mexico on environmental conservation. The North American Agreement on Environmental Cooperation (NAAEC) is a side agreement between the United States, Canada and Mexico, developed around the North American Free Trade Agreement (NAFTA), recognizing the need for environmental coordination and cooperation. This agreement establishes general obligations to which each country is committed and each member establishes its own policies and levels of environmental protection based on these commitments. The Commission for Environmental Cooperation and the North American Fund for Environmental Cooperation (NAFEC) were established through the NAAEC.[4] The Unites States and Mexico also work in cooperation with the International Maritime Organization (IMO) on addressing marine pollution issues from vessel discharge and ocean dumping.[5]		

[1] *Gulf of Mexico Alliance*. Web. Accessed November 2015. http://www.gulfofmexicoalliance.org/

[2] "Gulf of Mexico Program" *Environmental Protection Agency*. Web. Accessed November 2015. http://www.epa.gov/gmpo/

[3] "National Estuarine Research Reserve System" *NOAA Office of Coastal Management*. Web. Accessed November 2015. http://www.nerrs.noaa.gov

[4] *Commission for Environmental Cooperation*. Web. Accessed November 2015. http://www.cec.org/Page.asp?PageID=1226&SiteNodeID=310&BL_ExpandID=878

[5] *International Maritime Organization.* Web. Accessed November 2015. http://www.imo.org/About/Pages/Default.aspx

Article 11 - Post-Harvest Practices and Trade

11.1 Responsible fish utilization

11.1.11 Is international domestic trade in fish and fishery products in accord with sound conservation and management practices through the identification of the origin of fish and fish products traded?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The United States is a member of the World Trade Organization, and thus prescribes to the rules and regulations of members bodies as relates to import and		

export of goods.[1] According to the 2012 report by the FAO on the State of Fisheries and Aquaculture, the United States had surpassed Japan as the largest importer of shrimp in the world.[2]

Within their Technical Barriers to Trade (TBT) regulations, the World Trade Organization requires that trade access is granted equally, under uniformly favorable conditions and that a product may not be discriminated against in the marketplace due to origin.[3]

Within the United States, under the Code of Federal Regulations 101.18, identification of fishery products from domestic and international trade are required by the Customs and Border Protection Authority to have labels identifying their origin;[4] under the U.S. Department of Agriculture (USDA) Country of Origin Labels (COOL) Act, fish and shellfish shall be labeled to indicate whether they are from a farmed or wild-caught product.[5] At any time, the USDA may audit origin claims to verify an origin claim or product label.[6] The USDA Agricultural Marketing Service (AMS) is charged with administering and enforcing COOL requirements.[7,8] Under Section 403(a)(1) of 21 CFR 101,18, The Food and Drug Administration (FDA) prohibits any imported or domestic products from mislabeling or misleading consumers as to a product's origin.[9] The Federal Food, Drug and Cosmetics Act requires that all products entering into the United States have a label, in English, that contains information on nutrition, serving size, country of origin, and manufacturer's name and address.[10]

The imports of seafood and shrimp from abroad are managed under the Imported Seafood Safety Program and Hazard Analysis and Critical Control Points (HACCP) regulations administered by the U.S. Food and Drug Administration (FDA), which is charged with protecting human health through monitoring of food safety.[11] Under the regulations of the FDA, in the course of HACCP testing, imported shrimp in which "adulterants" (antibiotics) are found are refused entry into the United States.[12] In 2008, according to the FDA, 6.9% of imported shrimp contained illegal amounts of antimicrobial residue and were refused entry in to U.S. ports.[13] There is currently a "Detention without Physical Examination" refusal in effect for several major companies that import shrimp into the United States.[14]

NOAA Fisheries tracks imports and exports through the United States by type and country of origin, and makes their findings available on their website.[15]

Texas has adopted the above federal regulations under the Texas Food, Drug, and Cosmetic Act, Subtitle A of the Texas Health and Safety Code, which is administered and enforced by DSHS.[16]

[1] World Trade Organziation. (2015). *Members and Observers of the WTO*. Retrieved from World Trade Organization: https://www.wto.org/english/thewto_e/countries_e/org6_map_e.htm

[2] Food and Agriculture Organization of the United Nations. (2012). *State of the World Fisheries and Aquaculture.* Rome: FAO.

[3] World Trade Organization. (1994, April 15). *Agreement on Technical Barriers to Trade.* Retrieved from Legal Texts: the WTO Agreements: https://www.wto.org/english/docs_e/legal_e/ursum_e.htm

[4] 21 C.F.R. § 101.18

[5] 2 C.F.R. § 60.200

[6] 2 C.F.R. § 60.300 (2)

[7] *U.S. Department of Agriculture, Agricultural Marketing Service*. Web. Accessed November 2015. http://www.ams.usda.gov/AMSv1.0/cool

[8] "COOL Compliance and Enforcement Requirements" *U.S. Department of Agriculture.* Web. Accessed November 2015. http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5095400

[9] 21 C.F.R. § 101.18

[10] Nam, V. T. (2005). *U.S. Technical Barriers to Trade and Vietnamese Seafood Exports.* Tokyo: National Economics University. Retrieved from http://www.grips.ac.jp/vietnam/VDFTokyo/Temp/Doc/2005/DP07E-TVNamJul05.pdf

[11] U.S. Department of Health and Human Services. (2015, March 24). *The Imported Seafood Safety Program*. Retrieved from The Food and Drug Administration: http://www.fda.gov/Food/GuidanceRegulation/ImportsExports/Importing/ucm248706.htm#HACCP

[12] Lee, J. O., & Phelps, N. (2014). *Antimicrobial Residue in Farmed Shrimp.* Minneapolis : University of Minnesota College of Veterinary Medicine.

[13] *U.S. Department of Health and Human Services*. Web. Accessed March 2015.. http://www.fda.gov/Food/GuidanceRegulation/ImportsExports/Importing/ucm248706.htm#HACCP

[14] Lee, J. O., & Phelps, N. (2014).

[15] National Marine Fisheries Service. (2015, May). *National Oceanic and Atmospheric Administration*. Retrieved from Commercial Fishery Statistics: http://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/applications/trade-by-product

[16] "Food Group: Rules and Regulations" *Texas Department of State Health Services.* Web. Accessed June 2015. https://www.dshs.state.tx.us/foods/rules.shtm

11.2 Responsible international trade

11.2.3 Are measures affecting international trade in fish and fishery products transparent, based, when applicable, on scientific evidence, and in accordance with internationally agreed rules?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The United States International Trade Commission regulates trade of seafood products in accord with World Trade Organization (WTO) agreements.[1,2] The WTO, created in 1995, is an international organization that deals with rules of trade between nations through agreements that are negotiated and signed by participating countries		

with the aim of helping producers, exporters and importers conduct business internationally.[3] WTO agreements relating to fish products include the Agreement of Sanitary and Phytosanitary Measures (SPS), the Agreement on Technical Barriers to Trade (TBT) Agreement, the Agreement on Subsidies and Countervailing Measures.

The WTO SPS Measures are designed to protect human, animal and plant life or health and the Agreement on TBT requires member countries to utilize internationally agreed standards as the basis for technical trade regulations and limits on imports from other countries. The SPS Agreement recognizes the right of each country to protect its population, but requires that any measures taken to restrict trade be based on scientific evidence or risk assessment and the TBT Agreement set rules on how to handle aspects such as labeling disputes or testing procedures. U.S. practices are in accordance with the WTO agreements on SPS and TBT.

In 1995, the USFDA implemented the Hazard Analysis and Critical Control Point (HACCP) system for fish and fishery products stipulating that seafood importers must meet the same HACCP requirements as U.S. processors. The USFDA detains and inspects samples of imported seafood at ports of entry into the U.S. under the Federal Food, Drug, and Cosmetic Act (FFDCA) and reports on all detentions and violations.[4] USFDA foreign inspection coverage is based on product priorities and country-specific factors such as a history of high volume seafood exported to the US, or past violations and outcomes.[5]

Under the Food Safety Modernization Act (FSMA), which went into effect in 2011, The USFDA is required to report annually on the scope of their responsibility and activities under its jurisdiction. *The Annual Report on Food Facilities, Food Imports, and FDA Foreign Offices* contains information on USFDA actions including cooperation with other state, federal and local agencies, number of inspections of both domestic and foreign facilities, and number of samples analyzed for USFDA compliance.[6] The USFDA website contains features providing access and transparency of agency activities.

The US is a participating member of the Agreement on Subsidies and Countervailing Measures and has entered into, or is currently negotiating, several free trade agreements to minimize trade restrictions and obstacles.[7] Through these agreements, the US has reduced or eliminated most trade restrictions and the has some of the lowest tariffs among participating nations.[8]

Thailand, Indonesia, Ecuador, India, Vietnam, Mexico, and Malaysia are some of the largest exporters of shrimp into America, all of whom are also members of the WTO.[9,10] Imports of shrimp have recently (May, 2015) been refused from Malaysia for human health concerns, including unsafe levels of bacteria and nitrofurans, an antibiotic used to treat farmed shrimp that has carcinogenic effects in humans.[11] Additionally, several firms from Indonesia and Malaysia have been placed on a "Detention without Physical Examination" list due to consistently unsafe levels of antibiotics.[12]

The United Stated implemented Public Law 101-162, Section 609 in 1989, which prohibits the import of shrimp products that were harvested with commercial fishing technology that may adversely affect sea turtles.[13,14] Nations that have adopted sea turtle protection programs comparable to the U.S. or where incidental capture does not present a threat to sea turtles are exempt from this ban. Nations that seek to import shrimp into the U.S. must be certified annually, and the U.S. may inspect, if requested, portions of a nation's shrimp trawl fleet to verify that proper sea turtle conservation measures (use of TEDs) are in place. NOAA Fisheries Harvesting Systems Unit also provides extensive training throughout the world to improve TED use in trawl fisheries. There are approximately 40 countries certified to export shrimp to the U.S. and a listing of certified nations is published annually in the Federal Register.[15] When this law was first implemented, several disputed were filed; however, ultimately the WTO found that the U.S. compliance measures are justified as a conservation measure under Article XX(g) of the GATT 1994.[16] Concerns regarding Illegal, Unreported and Unregulated (IUU) fishing has recently become the focus of a new Presidential Initiative designed to combat IUU fishing, including identifying actions for how to limit seafood fraud and work with international partners to track seafood from harvest points to entry into the United States.[17] Eliminating IUU fishing would also extend to the Trans-Pacific Partnership, which is a regional trade agreement currently being brokered between the United States and many nations who export large amounts of seafood into the U.S, though reservations have been expressed regarding the impact the TPP would have on the U.S.'s ability to refuse unsafe seafood from potential TPP partners.[18,19] In 2013, the Coalition of Gulf Shrimp Industries filed a petition to launch a Countervailing Duty Investigation into the effects of importation of shrimp and potential market distortion of domestic product because of subsidies offered to exporters, claiming that unfair trading was damaging American shrimp industry.[20] After several years, it was determined that unfair trading was not the cause of impacts to the domestic shrimp industry, but it was instead the effects of the 2010 BP oil spill; no countervailing duties were lifted.[21] Sponsored by Louisiana Congressman Bill Boustany, H.R. 1907, the Trade Enforcement and Trade Facilitation Act (PROTECT Act) introduced in 2015, proposes stricter oversight and potential power of trade refusals relating to IUU imports affecting the health of the domestic shrimp market; it is touted as a solution to the impacts imported shrimp have on prices of domestic shrimp.[22] The bill has not yet passed and it is unclear what effect it would have on international trade in shrimp products.		

[1] *The United States International Trade Commission*. Web. Accessed November 2015. http://www.usitc.gov/tata/hts/bychapter/

[2] "Fish Trade Regulations" *FAO*. Web. Accessed November 2015. http://www.globefish.org/fish-trade-regulations-on-the-web.html

[3] The World Trade Organization (WTO). Web. Accessed September 2015. http://wto.org/english/thewto_e/thewto_e.htm

[4] Allshouse, J., J. Buzby, D. Harvey, and D. Zorn. Chapter 7. International Trade and Food Safety, Chapter 7-International Trade and Seafood Safety. Economic Research Service/USDA.

[5] FDA. 2012. Report to Congress: Annual Report on Food Facilities, Food Imports, and FDA Foreign Offices, Provisions of the FDA Food Safety and Modernization Act http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm150954.htm

[6] *Food and Drug Administration.* Web. Accessed November 2015. http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm315486.htm

[7] Renée Johnson. *Sanitary and Phytosanitary (SPS) and Related Non-Tariff Barriers to Agricultural Trade. Specialist in Agricultural Policy*. Congressional Research Service Report 7-5700. R43450. March 31, 2014 http://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43450.pdf

[8] Roheim, C.A. 2004. "Impacts on Sustainability." *Global agricultural trade and developing countries* (2004): 275. http://siteresources.worldbank.org/INTPROSPECTS/Resources/GATChapter15.pdf

[9] National Marine Fisheries Service. (2015, May). *National Oceanic and Atmospheric Administration*. Retrieved from Commercial Fishery Statistics: http://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/applications/trade-by-product

[10] World Trade Organization. (2015). *United States of America and the WTO*. Retrieved from Member Information: https://www.wto.org/english/thewto_e/countries_e/usa_e.htm

[11] U.S. Food and Drug Administration. (2015, June 9th). *Import Alert 16 - 129*. Retrieved from http://www.accessdata.fda.gov/cms_ia/importalert_31.html

[12] U.S. Food and Drug Administration. (2015, June 9th). *Import Alert 16 - 129*. Retrieved from http://www.accessdata.fda.gov/cms_ia/importalert_31.html

[13] "Shrimp Import Legislation for Sea turtle Conservation" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/turtles/shrimp.htm

[14] 16 U.S.C. 1537 http://www.gpo.gov/fdsys/pkg/USCODE-2011-title16/html/USCODE-2011-title16-chap35-sec1537.htm

[15] *Federal Register*. Web. Accessed November 2015. https://www.federalregister.gov/articles/2015/05/27/2015-12750/certifications-pursuant-to-section-609-of-public-law-101-162

[16] World Trade Organization. (1998). *Case DS58 US Shrimp.* Geneva: World Trade Organization. https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds58_e.htm

[17] National Oceanic and Atmospheric Administration. (2015, June 17th). *NOAA Fisheries*. Retrieved from Presidential Initiative on Combating Illegal, Unreported, and Unregulated (IUU) Fishing and Seafood Fraud: http://www.fisheries.noaa.gov/ia/iuu/taskforce.html

[18] Center for Food Safety. (2014, December). *Seafood Safety and the Trans-Pacific Partnership (TPP).* Retrieved from Center for Food Safety: http://www.centerforfoodsafety.org/files/tpp-and-seafood-fact-sheet_00590.pdf

[19] National Oceanic and Atmospheric Administration. (2015, June 17th).

[20] Department of Commerce. (2013, January 18th). *Commerce Initiates Countervailing Duty Investigations of Certain Frozen Warmwater Shrimp from the People's Republic of China, Ecuador, India, Indonesia, Malaysia, Thailand, and the Socialist Republic of Vietnam.* Retrieved from International Trade Administration: http://enforcement.trade.gov/download/factsheets/factsheet_multiple-shrimp-cvd-init-20130118.pdf

[21] Murphy, S. (2015, April 6th). *U.S. Rejects COGSI Countervailing Duty Appeal.* Retrieved from Seafood Source News: http://www.seafoodsource.com/news/supply-trade/27930-u-s-court-rejects-cogsi-shrimp-countervailing-duty-appeal

[22] H.R. 1907 – Trade Enforcement and Facilitation Act of 2015, Sec. 421

Article 12 - Fisheries Research

12.1 Responsible fishing requires the availability of a sound scientific basis to assist fisheries managers and other interested parties in making decisions, taking into account the special needs of developing countries.

(a) Is appropriate research conducted into all aspects of fisheries, including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA Fisheries is responsible for Gulf-wide research on fisheries, including biological, ecological, technology, and socioeconomics. NOAA's SEFSC, based in Miami, FL, is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[1] GSMFC also contributes to research on Gulf of Mexico Fisheries through the SEAMAP and Fisheries Economic Data Programs.[2] For details on SEFSC and GSMFC research pertaining to the resource, environment, and socioeconomics, see responses to 7.1.7 (a) and 7.4.2 (i) - 7.4.2 (iii). TPWD supports a wide range of ongoing research covering all aspects of fisheries management including biological, ecological, genetic, economic, socio-cultural, and aquaculture science. In addition to research through the resource monitoring program (see 7.1.7 (a) for details) and special studies conducted at the CFD ecosystem branches, genetic and life history research is conducted at the Perry R. Bass Marine Fisheries Research Station, and aquaculture research is carried out at the CCA Marine Development Center hatchery. [3,4,5] Socioeconomic research is conducted through a variety of methods including field and mail surveys, public hearings written comment periods, and economic impact assessments for new regulations.[6] TPWD also collaborates with other government agencies on environmental research, including TCEQ, TWDB and NOAA, and utilizes academic research on all aspects of fisheries. NERR also conducts ongoing research of coastal estuaries.[7] Texas currently has one NERR, the Mission-Aransas NERR, which conducts system-wide monitoring and		

research. [8] Nutritional science is researched by national organizations such as the USFDA and academic institutions such as the Texas A&M Nutrition and Food Science Program.[9,10] Nutritional information is also disseminated by the Gulf States Marketing Coalition as a part of the GSMFC ODRP program.[11,12]		

[1] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[2] *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/

[3] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[4] "Perry R. Bass Marine Fisheries Research Center" *Texas Parks and Wildlife Department*. Web. Accessed June 2015.

[5] "CCA Marine Development Center" *Texas Parks and Wildlife Department*. Web. Accessed June 2015.

[6] AFS, 2005

[7] "National Estuarine Research Reserve System" *NOAA Office of Coastal Management*. Web. Accessed June 2015.

[8] "Mission- Aransas NERR" *NOAA Office of Coastal Management*. Web. Accessed June 15.

[9] "Center for Food Safety and Applied Nutrition" *U.S. Food and Drug Administration*. Web. Accessed June 2015.

[10] "Nutrition" *Texas A&M College of Agriculture and Life Sciences*. Web. Accessed June 2015.

[11] "Nutritional Comparison" *Gulf States Marketing Coalition*. Web. Accessed June 2015.

[12] "Oil Disaster Recovery Program" *Gulf States Marine Fisheries Commission*. Web. Accessed June 2015.

12.1 (b) Are research vessel surveys of the resource and the marine environment carried out?
Annually...[1] **Occasionally...**[½] **No...**[0]

Extent of compliance		
Annually	**Occasionally**	**No**
Federal: NOAA Fisheries SEFSC conducts resource surveys in the Gulf of Mexico through the Mississippi Labs.[1] Annual surveys include the Groundfish surveys, Longline surveys, Marine Mammal surveys, Plankton surveys, and Reef fish surveys. Groundfish surveys have been conducted since the 1950s and consist of two bottomfish trawl surveys (summer and fall) and a small pelagic trawl survey in winter.[2] Longline surveys occur yearly utilizing commercial longline gear.[3] Plankton surveys are conducted throughout the year sampling for fish eggs, larvae and juveniles and their zooplankton predators and prey; Winter surveys focusing on grouper and tilefish species,		

Spring surveys focus on bluefin tuna, and Fall surveys focusing on spawning fish such as red drum, mackerels and snappers.[4] Sampling is conducted using a variety of gear types including bongo nets, neuston nets, CUFES, MOCNESS and Methot trawls. Fishery-independent data collected through resource surveys provides a valuable time-series to monitor trends in resource abundance and is utilized in NOAA stock assessments and other research programs.

SEAMAP- Gulf of Mexico also conducts resource surveys that are used to assess the shrimp fishery through the Summer and Fall Shrimp/Groundfish Surveys.[5] Objectives include (but are not limited to):

- Monitoring penaeid shrimp size and distribution
- Evaluating the "Texas Closure" portion of GMFMC's FMP
- Providing data on shrimp and groundfish stocks
- Obtaining measurements to determine population size structures

Other annual SEAMAP resource surveys include the Spring Plankton Survey, Reef Fish Survey, Fall Plankton Survey and plankton and environmental data surveys. SEAMAP-Gulf produces Environmental and Biological Atlases of the Gulf of Mexico, which include information on dominant finfish and invertebrate catches from surveys, environmental data and survey methodology. Additionally, SEAMAP may participate in other projects such as the Fish Tagging Cruise, and coordinating finfish bycatch estimates.

Texas:

TPWD has sampled for shrimp size and abundance since 1959. The commercial shrimp industry in Texas waters is monitored through fishery independent and dependent data. Fishery independent data include information regarding TPWD bag seine (collected since 1977), bay trawl (collected since 1982), and Gulf trawl sample data (collected since 1986), along with NMFS trawl data. Fishery dependent data consists of NMFS bay and Gulf shrimp landings and catch data, TPWD commercial bay and bait landings data, and TPWD recreational fishery data. Commercial landings information has been collected since as early as 1887. In 1936, TPWD initiated annual surveys for landings and value of finfish, oysters, crabs and shrimp through the Monthly Aquatic Products Report. In 1985, NMFS and TPWD agreed to collecting and exchanging fisheries statistics. NMFS collects commercial shrimp data (excluding bait) while TPWD collects all other commercial data.

Since 1974, TPWD has collected marine-sport boat harvest data through interviews. Landings data are taken from each fishing party to determine fishing effort and decipher the fishing gear and bait used. In 1983, TPWD began collecting data regarding the source and amount of bait shrimp used by each fishing party.[6]

[1] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[2] "Groundfish Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/groundfish.htm

[3] "Longline Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/longline.htm

[4] "Plankton Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/plankton.htm

[5] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[6] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

12.1 (c) Are appropriate research and training facilities available and provisions made for staffing and institution building to conduct the necessary research? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The NOAA southeast Regional Office is located in St. Petersburg, Florida. NOAA Southeast Fishery Science Center (SEFSC) has laboratory locations in Beaufort, North Carolina, Galveston, Texas, Lafayette, Louisiana, Miami, Florida, Panama City, Florida, Pascagoula, Mississippi, and Stennis Space Center, Mississippi.[1] For certain programs, such as the observer program detailed in 12.1 (b), NOAA Fisheries may also make use of private companies to recruit, hire, and deploy observers. These observers are highly trained according to strict guidelines set by the SEFCS Galveston Laboratory.[2] The GMFMC headquarters is located in Tampa, FL.[3] The GSMFC is located in Ocean Springs, MS.[4] **Texas:** TPWD headquarters is located in the state capital of Austin to facilitate government participation and activities. TPWD Coastal Fisheries Division offices/labs are located throughout the coast with one facility located in each Ecosystem division.[5] The Sea Center Texas, located in Lake Jackson, functions as both an educational center and a hatchery, and the Perry B. Bass Marine Fishery Research Station and the CCA Marine Development Center both house research facilities. [6,7,8] TPWD currently maintains a training facility in Austin for game warden training, and is in the process of completing a new facility in Hamilton County to expand its training facilities. [9] TPWD also maintains and continually updates manuals for protocols and methodology to maintain quality and consistency in research across facilities and when training new staff.[10]		

[1] "About Us" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/about_us/what_we_do/index.html

[2] NMFS. Observer Training Manual: Characterization of the US Gulf of Mexico and Southeastern Atlantic Otter Trawl and Bottom Reef Fish Fisheries. September 2010. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/pdf/Shrimp_Reef_fish_Manual_9_22_10.pdf

[3] "Contact Us" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/contact.php

[4] "Contact Us" *Gulf State Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/contact.php

[5] "Coastal Fisheries Field Offices" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://tpwd.texas.gov/business/about/divisions/coastal_fisheries/offices/index.phtml

[6] "Sea Center Texas" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/spdest/visitorcenters/seacenter/

[7] "Perry R. Bass Marine Fisheries Research Center" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/fishboat/fish/management/hatcheries/prb.phtml

[8] "CCA Marine Development Center" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/fishboat/fish/management/hatcheries/ccacpl.phtml

[9] "Training center Overview" *Texas parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/warden/training-center/overview

[10] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

12.2 Has an appropriate institutional framework been established to determine the applied research which is required and its proper use? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC maintains a Scientific and Statistical Committee (SSC) responsible for providing scientific advice to the Council.[1] The SSC is responsible for advising the Council on the adequacy of scientific information and analyses for proposed management measures and alternatives. The SSC reviews FMPs and amendments, including environmental impact statements, environmental assessments, and regulatory impact reviews and provides a determination of whether these are based on the best scientific evidence available. The SSC establishes research priorities based on management needs and submits these to NOAA Southeast Fisheries Science Center (SEFSC).[2] Research is then carried out by SEFSC's various labs and research programs across the Gulf o meet these needs.[3] **Texas:** TPWD CFD has a comprehensive organizational structure to determine research		

needs, conduct research based on those needs and utilize the results of research in management decisions.[4] The CFD is broken down into ecosystem branches assigned to monitor and assess the needs of specific regional areas, a Science and Policy Branch oversees coast-wide assessments and advances the management recommendations made by biologists and ecosystem leaders. The Water Resources Branch and ERP determine and carry out research needs related to habitat, water quality and other environmental factors.[5,6] Academic institutions and non-government organizations are also often utilized for applied research on specific coastal issues. For example, TPWD is supporting research by University of Houston-Clear Lake and collaborating with the Coastal Bend Bays and Estuaries Program.[7,8]		

[1] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[2] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[3] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[4] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[5] "Water Quality" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://tpwd.texas.gov/landwater/water/environconcerns/water_quality/

[6] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[7] "Critical Life History Parameters of the Texas Diamondback Terrapin, *Malaclemys terrapin littoralis*" *Environmental Institute of Houston, University of Houston- Clear Lake*. Web. Accessed June 2015. http://prtl.uhcl.edu/portal/page/portal/EIH/research/terrapin-life-history

[8] Aaron S. Baxter, *Diamondback Terrapin Paired Crab Trap Study in the Nueces Estuary, Texas.* Publication CBBEP-87, Project Number-1329. Coastal Bend Bays and Estuaries Program, 2013. http://cbbep.org/publications/CBBEP1329.pdf

12.3 (a) Are data generated by research being analyzed and the results of such analyses published in a way that confidentiality is respected where appropriate? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
GMFMC, GSMFC and TPWD each maintain strict confidentiality requirements in compliance with state and federal laws. For full details, refer to 7.4.7 response. NOAA stock assessments, FMPs and other reports are reviewed by the GMFMC SSC and are published on the GMFMC website in accordance with the		

confidentiality requirements. GSMFC research is peer-reviewed and published on the GSMFC website. Summaries of non-confidential data are disseminated to the public and other agencies. TPWD utilizes resource and harvest data for internal trends reports that are reviewed annually, and publishes summary reports periodically. TPWD stock assessments are peer-reviewed and posted for public availability on the TPWD website.[1] TPWD falls under the Texas Government Code which provides for the confidentiality of commercial or financial information.[2]		

[1] "Publications" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/publications/fishboat/fish/fisheries_management/mds_coastal.phtml

[2] Tex Gov. Code § 552.110 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.552.htm

12.3 (b) Are results of analyses being distributed in a timely and readily understandable fashion in order that the best scientific evidence be made available as a contribution to fisheries conservation, management and development? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC meeting minutes, stock assessments, scientific reports and other publications are made available online through their website and are also available in writing through public records requests.[1] The GMFMC also provides briefing materials through their website for committee members and general public to access prior to each meeting.[2] Timelines vary for documents posted in briefing folders depending upon the project but are typically posted a few weeks prior to the meeting for documents being referenced. Meeting minutes from the most recent prior council meeting appear in the briefing folder for the next upcoming council meeting (council meetings occur five times a year and generally fall about two months apart.) The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research and publishes summary reports and analyses.[3] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. Additional information for shrimp is gathered through the Gulf Shrimp System (GSS), which includes data collection by port agents stationed throughout the Gulf of Mexico.[4] Weekly reports are posted on the NOAA Fisheries Statistics website documenting 1) Gulf Shrimp Landings by area and species, and 2) ex-vessel price and landings, and a monthly Gulf Coast Shrimp Statistics report is also posted.[5] GSMFC publishes reports and assessments as soon as possible once approved by the commission. These reports are posted online in the publications area of the		

GSMFC website.[6] Notification of availability is sent to newspapers and local media as well as posted on GSMFC and state agency social media and web pages and is announced in the GSMFC quarterly newsletter. Meeting minutes and records are compiled into a 'draft minutes book' twice a year after both the spring and fall annual meetings and sent to the commissioners and meeting participants within 2-3 months. All GSMFC meeting minutes are collated by year and published annually. Documents not immediately available on the website can be requested directly from GSMFC and are typically provided within one week of the request. TPWD raw data are available immediately; data from the field are directly entered into a database that all necessary staff can access. Data are analyzed in yearly trends reports and reviewed by ecosystem leaders and an annual staff meeting is held to review reports and propose regulation changes. Analyzed reports are disseminated throughout the agency in a timely manner for in-house use and reporting. Non-confidential information and summaries are made available to other agencies and non-governmental institutions. TPWD also publishes assessments and technical reports in the TPWD Management Data Series and posts these online as soon as they are available.[7] TPWD stock assessments and technical reports are also available in print upon request. Special studies conducted by TPWD scientists are also published in scientific journals and presented at conferences when relevant. Contact information is provided for primary authors or principle investigators of published reports for further inquiry.		

[1] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[2] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[3] "Fisheries Statistics" NOAA Southeast Fisheries Science Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[4] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[5] "Commercial Fisheries Statistics" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[6] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[7] "Publications" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/publications/fishboat/fish/fisheries_management/mds_coastal.phtml

12.3 (c) In the absence of adequate scientific information, is appropriate research being initiated in a timely fashion? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC maintains a Scientific and Statistical Committee (SSC) responsible for		

providing scientific advice to the Council.[1] The SSC is responsible for advising the Council on the adequacy of scientific information and analyses for proposed management measures and alternatives. The SSC establishes research priorities based on management needs and submits these to NOAA Southeast Fisheries Science Center (SEFSC).[2] Research is then carried out by SEFSC's various labs and research programs across the Gulf to meet these needs.[3] **Texas:** TPWD continually strives to keep pace with changing research priorities as a result of fluctuating fisheries dynamics and needs. Rigorous resource monitoring and regular review of harvest and resource data highlights changing research needs and provides a basis for research priorities (see response to 12.1(a)).		

[1] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC)
http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[2] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council.
http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[3] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015.
http://www.sefsc.noaa.gov/research/

12.4 (a) Are reliable and accurate data required to assess the status of fisheries and ecosystems - including data on bycatch, discards and waste - being collected? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA Fisheries is responsible for assessing and managing Gulf shrimp fisheries. NOAA SEFSC is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[1] SEFSC Research and Data programs are responsible for biological, economic and socio-cultural research and data collection for commercial and recreational fisheries, economics and fisheries-independent data. For full details on NOAA's data collection programs, including port agents, trip tickets, and required reporting by fishermen, refer to the responses to 7.4.6 and 7.1.7 (a). Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[2] These methods include the implementation of an ELB for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition. The Electronic Logbook (ELB) Program and the Observer Program are run by the Galveston Lab.[3,4] Both programs became mandatory in 2007 and, if selected, Gulf shrimp permit holders are required to participate in these programs and permit renewal is contingent upon participation. Permit holders are selected by the Southeast		

Regional Director through a stratified random sampling method. The ELB program collects data on amount and location of shrimp landings. The focus of data collection for the shrimp fishery Observer Program is bycatch and BRD evaluation.[5] The Observer Program evaluates TEDs and bycatch reduction devices (BRDs), quantifies bycatch and characterizes bycatch species composition. The Galveston Lab regularly publishes research on the shrimp fishery and contributes data and research results to the National Observer Program, which also produces reports biannually. Bycatch data from the observer and ELB programs is also utilized by the SEDAR process when conducting stock assessments of other species.[6] The most recent report on shrimp otter trawl bycatch (Scott-Denton et al. 2012) from the Galveston Lab determined that total bycatch to shrimp ratio had decreased to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[7] Characterization of bycatch composition from this report shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*), and sea turtles are also known bycatch species.[8] This bycatch species composition is consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Based on a recent analysis by Raborn et al. (2014) the only species (or species group) that represent 5% or higher in shrimp trawl bycatch are Atlantic croaker, seatrouts, longspine porgy, and inshore lizardfish. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to their populations.[9] One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[10] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. USFWS and NOAA Office of Protected Resources are responsible for research and assessment of species on the endangered species list and assessments and recovery plans are updated every five years.[11] NOAA is also required to consult on activities that may impact endangered species and has produces several Biological Opinions relating to sea turtles and the shrimp trawl fishery in the Gulf of Mexico. The most recent biological opinion was published in 2014 and authorizes the continued operation of the shrimp trawl fishery.[12] A new consultation (resulting in a biological opinion) is initiated if there is new information or an action is modified that has not previously been considered, or if an incidental take statement is exceeded. Promoting consistency with the ESA and MMPA, and minimizing incidental capture of finfish species are two major objectives of the GMFMC Shrimp FMP.[13]

Texas:

TPWD does not conduct full stock assessments specific to shrimp in Texas waters because shrimp are part of a larger Gulf of Mexico stock assessed by GMFMC (see above); however, TPWD does monitor shrimp size and abundance in state waters through trends reports.

TPWD collects fishery-independent data through monthly resource sampling programs, and biostatistical sampling at seafood dealers.[14,15] Fishery-dependent data

are collected monthly through the Trip Ticket Program (previously Monthly Aquatics Product Report).[16] For details on these programs, refer to the response to 7.1.7 (a). These programs provide data on both target and non-target species and are often supplemented with special studies, when needed, to address changes in trends, bycatch and discards.[17]		

[1] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[4] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[7] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[8] National Marine Fisheries Service. 2011.

[9] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[10] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[11] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[12] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[13] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[14] Texas Parks and Wildlife Department. *Marine Resource Monitoring Operations Manual*. Updated by: F. Martinez-Andrade and M. Fisher. Texas Parks and Wildlife Department, Coastal Fisheries Division, 2012.

[15] Fernando Martinez-Andrade, Page Campbell, and Billy Fuls, *Trends in Relative Abundance and Size of Selected Finfishes and Shellfishes Along the Texas Coast, November 1975-December 2003* (Texas Parks and Wildlife, Coastal Fisheries Division, MDS 232, 2005)
http://www.tpwd.state.tx.us/publications/pwdpubs/media/mds_coastal/Series%202_MDS232.pdf

[16] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[17] Billy Fuls, Tom Wagner and Lawrence McEachron. *Characterization of Commercial Shrimp Trawl Bycatch in Texas During Spring and Fall Commercial Bay-Shrimp Seasons: 1993-1995.* (Texas Parks and Wildlife, Coastal Fisheries Division, MDS 180, 2002).
https://tpwd.texas.gov/publications/pwdpubs/media/mds_coastal/Series%202_MDS180.pdf

12.4 (b) Are these data being provided, at an appropriate time and level of aggregation, to relevant States and subregional, regional and global fisheries organizations? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC utilizes data collected through NOAA Fisheries and each of the five Gulf state management agencies. GMFMC maintains a standing Data Collection Committee, which "reviews and advises the Council on the data requirements for managing each fishery, the statistical methodology needed, and on all issues related to data and data collection."[1] The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[2] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. Data are submitted to each state agency by dealers on a monthly basis. Additional information for shrimp is gathered through the GSS.[3] Port agents are responsible for collecting both landings data from seafood dealers and interview data from either the captain or a member of the crew and data entry into the GSS is ongoing as information is collected. Data collected by port agents include amount and value of shrimp landed, fishing effort, and locations fished. Weekly reports are posted on the NOAA Fisheries Statistics website documenting 1) Gulf Shrimp Landings by area and species, and 2) ex-vessel price and landings, and a monthly Gulf Coast Shrimp Statistics report is also posted.[4] Additionally, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal.[5] Data are also collected on the shrimp fishery through the Electronic Logbook		

(ELB) Program and the Observer Program.[6,7] The new cELB program, which began in 2014, transmits the most recent data from vessels directly to the Galveston Lab whenever the vessel is within cellular range. Observer coverage is compiled into annual reports made available to federal and state fisheries managers and posted publically on NOAAs website. NOAA Fishery-Independent Resource Surveys are conducted through the SEFSC Mississippi Labs. Shrimp/Bottomfish surveys are conducted each fall and summer, which are designed to provide a time-series for monitoring trends in resource abundance.[8] Data are made available to both state and federal resource managers. GSMFC: Fishery-related and other supporting scientific data are gathered individually by each state's management agency and submitted and reviewed regularly by GSMFC. The GSMFC meets twice a year (March and October) to review scientific data and regional management activities. Data on fishery trends in landings, values, and other activities of the fishery are presented by each state and reviewed at each meeting. The GSMFC IJF program also collects data regularly for regional assessments and FMP updates of stocks not covered by federal FMPs; data are submitted by the states on request based on the needs of specific projects. GSMFC FMPs are reviewed every five years and updated at intervals determined by the TCC.[9] GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[10,11] **Texas:** Trip ticket data are collected on a monthly basis by TPWD.[12] Trip ticket information is compiled by TPWD and sent to the NOAA SEFSC on a regular basis for the purpose of maintaining a regional data set for the Gulf of Mexico.[13] NOAA-NMFS has agreements with each of the state agencies to gather data on landings quantity and value, which are compiled into a continuous data set beginning in 1960. These data set is available online.[14] TPWD independent monitoring data are initially made available as raw data to TPWD fishery managers for necessary management decisions. Data then go through a QA/QC process and are collated and reviewed annually to determine status and trends of stocks. Data are submitted regularly to regional organizations, such as GSMFC and GMFMC, as needed for reports and assessments. Summaries of non-confidential information are made available to the public.[15]		

[1] GMFMC, 2012. Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[5] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[6] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[7] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[8] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[9] VanderKooy, Steve. GSMFC. Personal Communication. August, 2014.

[10] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[11] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[12] FIN Committee, *Annual Report of the Fisheries Information Network in the Southeast Region (FIN) January 1, 2013 - December 31, 2013*. Gulf States Marine Fisheries Commission. Ocean Springs, MS, 2014. http://www.gsmfc.org/publications/GSMFC%20Number%20231.pdf

[13] "Landings" *Southeast Fisheries Science Center*. Web. Accessed June 2015. http://www.sefsc.noaa.gov/data/landings.htm

[14] "Commercial Fishery Statistics" *NOAA Office of Science and Technology*. Web. Accessed June 2015. http://www.st.nmfs.noaa.gov/commercial-fisheries/

[15] "Publications" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/publications/fishboat/fish/fisheries_management/mds_coastal.phtml

12.5 (a) Are States monitoring and assessing the state of the stocks under their jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the Gulf of Mexico shrimp fishery and produces the following reports: Closure analysis reports for the Texas and Tortugas closure areas, stock assessment reports, shrimp stock trend analysis reports, recruitment overfishing monitoring reports, growth overfishing analysis reports, shrimp effort estimation and analysis reports and YPR analysis reports.[1]		

Texas: TPWD rigorously monitors stocks under state jurisdiction through CFD's independent sampling program and harvest data collected through the Trip Ticket Program.[2,3,4] The CFD ERP and WRD address the effects of habitat loss or alterations and other environmental factors on fish stocks.[5,6] TPWD also coordinates with TWDB on freshwater inflow needs for Texas estuaries and bays and the State Methodology for Determination of Needs in Major Estuaries of Texas includes five indicator species (shrimp being one) to determine biological and ecological needs of these systems. [7,8] Habitat alteration and pollution are highly regulated and monitored through both TCEQ and USACE. [9,10]		

[1] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[2] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[3] Steve VanderKooy (ed). GDAR01 Gulf of Mexico Blue Crab Stock Assessment Report (Gulf States Marine Fisheries Commission. Ocean Springs, MS. GSMFC Number 215, 2013) http://www.gsmfc.org/publications/GSMFC%20Number%20215.pdf

[4] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[5] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[6] "Water Quality" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/

[7] *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/surfacewater/flows/freshwater/index.asp

[8] Texas Water Department Board. "State Methodology for Determination of Needs in the Major Estuaries of Texas" Austin, TX March 2013. http://www.twdb.texas.gov/surfacewater/flows/freshwater/doc/State_Methodology.pdf

[9] *Texas Commission on Environmental Quality*. Web. Accessed June 2015. http://www.tceq.state.tx.us/

[10] "Galveston District – mission" *U.S. Army Corps of Engineers*. Web. Accessed June 2015. http://www.swg.usace.army.mil/Missions/TexasCoastValuetotheNation.aspx

12.5 (b) Have they established the research capacity necessary to assess the effects of climate or environment change on fish stocks and aquatic ecosystems? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries conducts research on climate change and fisheries.[1,2]		

In March 2015, NOAA Fisheries released a draft Climate Science Strategy (NCSS) for public comment. This strategy is designed to collect and provide information on changing climate and ocean conditions to better prepare for and respond to climate-related impacts.[3]
The NCSS includes the following objectives:

- Objective 1: Identify appropriate, climate-informed reference points for managing living marine resources (LMRs).
- Objective 2: Identify robust strategies for managing LMRs under changing climate conditions.
- Objective 3: Design adaptive decision processes that can incorporate and respond to changing climate conditions.
- Objective 4: Identify future states of marine and coastal ecosystems, LMRs, and LMR-dependent human communities in a changing climate.
- Objective 5: Identify the mechanisms of climate impacts on LMRs, ecosystems, and LMR-dependent human communities.
- Objective 6: Track trends in ecosystems, LMRs and LMR-dependent human communities and provide early warning of change.
- Objective 7: Build and maintain the science infrastructure needed to fulfill NOAA Fisheries mandates with changing climate conditions.

For each of the objectives listed, there are specific actions identified to help achieve that objective within the strategy. The NCSS also includes a set of priority recommendations.

NOAA conducts monitoring, research, modeling and assessment activities to inform fisheries management and protected resources in a changing environment. The Fish Stock Climate Vulnerability Assessment is currently being used to identify which stock may be most vulnerable to climate change, identifying areas where more data are needed, and providing a basis for actions that can be taken to reduce impacts.[4]

NOAA Fisheries Climate website provides a series of tools currently available regarding climate resilience including OCEANADAPT, which is a web-based tool developed through a partnership between NOAA Fisheries and Rutgers University that provides information about the distribution of commercially and recreationally important marine species over time.[5,6]

The SEFSC recently published the Ecosystem Status Report for the Gulf of Mexico in December 2013. This report includes information on climate drivers and physical pressures on the GOM ecosystem as well as fishing indicators.[7]

Texas:
The CFD ERP and WRD address the effects of habitat loss or alterations and other environmental factors on fish stocks.[8,9] TPWD also coordinates with TWDB on freshwater inflow needs for Texas estuaries and bays. The model utilized in the State Methodology for Determination of Needs in Major Estuaries of Texas includes parameters for minimum freshwater needs to maintain the stocks of five indicator species (shrimp being one) to determine biological and ecological needs of these systems.[10,11]

[1] "Climate Portal" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/stories/2014/03/climate_portal.html

[2] NOAA Fisheries. *Fish Stock Climate Vulnerability Assessment*. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/Fish_Stock_Climate_Vulnerability_Assessment.pdf

[3] NOAA Fisheries. *Draft Climate Science Strategy*. January 2015. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/draft_NOAA%20Fisheries_Climate_Science%20Strategy_Jan_2015.pdf

[4] "Assessing the Vulnerability of Fish Stocks in a Changing Climate" *NOAA Fisheries*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/activities/assessing-vulnerability-of-fish-stocks

[5] "Climate Tools" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/tools/index

[6] *Ocean Adapt*. Web. Accessed November 2015. http://oceanadapt.rutgers.edu/

[7] Mandy Karnauskas, Michael J. Schirripa, Christopher R. Kelble, Geoffrey S. Cook and J. Kevin Craig. *Ecosystem Status Report for the Gulf of Mexico*. NOAA Technical Memorandum NMFS-SEFSC-653. December 2013. http://gulfcouncil.org/docs/Gulf%20of%20Mexico%20Ecosystem%20Status%20Report.pdf

[8] "Ecosystem Resources" *Texas Parks and Wildlife Department.* Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/conservation/coastal_studies/index.phtml

[9] "Water Quality" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/

[10] *Texas Water Development Board*. Web. Accessed June 2015. http://www.twdb.texas.gov/surfacewater/flows/freshwater/index.asp

[11] Texas Water Department Board. "State Methodology for Determination of Needs in the Major Estuaries of Texas" Austin, TX March 2013. http://www.twdb.texas.gov/surfacewater/flows/freshwater/doc/State_Methodology.pdf

12.6 Are states taking steps to support and strengthen research capabilities to meet acknowledged scientific standards? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: 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.[1] The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management. National Standard 2 (NS2) requires that "*Conservation and management measures shall be based upon the best scientific information available.*"[2] The MSA,		

section 302(g)(1)(A) requires each regional management council to form a Scientific and Statistical Committee (SSC) to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[3] The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf States. The SSC establishes research priorities based on management needs and submits these to NOAA Southeast Fisheries Science Center (SEFSC).[4] Research is then carried out by SEFSC's various labs and research programs across the Gulf o meet these needs.[5] **<u>Texas</u>:** TPWD annually reviews scientific protocols and methods and updates manuals and procedures as necessary to keep pace with advances in fisheries science. In 2005, TPWD solicited a peer-review evaluating its scientific methods from AFS and implemented all recommendations made by the review team.[6,7] TPWD scientists also attend workshops and conferences to stay up-to-date on current research methods within their field, and participate in regional organizations, including GSMFC and GMFMC to collaborate on scientific research.[8,9] The Texas Sunset Act also requires that each government agency be evaluated every 12 years to determine its efficiency and effectiveness and recommendations are made and implemented through this process.[10]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[4] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[5] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[6] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

[7] TPWD. Response to "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department" AFS, 2005. Unpublished Report.

[8] *Gulf States Marine Fisheries Commission*. Web. Accessed June 2015. http://www.gsmfc.org/

[9] *Gulf of Mexico Fishery Management Council*. Web. Accessed June 2015. http://www.gulfcouncil.org/

[10] Tex. Gov. Code § 325.001 http://www.statutes.legis.state.tx.us/Docs/GV/htm/GV.325.htm

12.7 (a) Are states cooperating with relevant regional organizations to encourage research in order to ensure optimum utilization of fishery resources? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the U.S. The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management.[1] NS1 requires "*Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.*"[2] Current guidelines for NS1 require specification of maximum sustainable yield (MSY) and Optimum Yield (OY), based on the best scientific evidence available, for each fishery managed by the Councils. Additionally, NS1 requires specification of status determination criteria (SDC) so that overfishing and overfished determinations can be made for stocks in the fishery. The NS1 guidelines are designed to prevent overfishing and ensure that the fishery achieve OY and require corrective actions to be taken to rebuild stocks if overfishing or overfished conditions occur. The GMFMC implemented the Shrimp FMP in 1981, which currently includes brown shrimp, white shrimp, pink shrimp, and royal red shrimp in the Gulf of Mexico.[3] The goals/objectives of Shrimp FMP include optimizing the yield of shrimp recruited to the fishery. Amendment 5 of the Shrimp FMP defined overfishing and provided measures to restore overfished stocks, should overfishing occur, for brown, pink and royal red shrimp, and Amendment 7 similarly defined overfishing and measures to restore stocks if overfished for white shrimp.[4,5] Amendment 13 further defined reference points for each of the penaeid shrimp species to comply with the requirements of MSA NS1 and includes definitions of Maximum Fishing Mortality Threshold (MFMT) and Minimum Stock Size Threshold (MSST).[6] The GMFMC manages the shrimp fishery in relation to these reference points to ensure optimal yield and long-term availability for future generations. Texas participates in research to support optimal utilization of resources regionally through GMFMC.[7] Though there is currently no formal cooperation with respect to the shrimp fishery, there is cooperation between the United States and Mexico regarding fisheries		

management in the Gulf of Mexico. The United States-Mexico Fisheries Cooperation Program is a bilateral consultative agreement that was informally agreed upon by the NMFS and SAGARPA in 1983.[8] Three memoranda of understanding (MOU) have been formalized through this relationship including the MEXUS-Golfo research program. Fishery Cooperation Talks (FCT) between NMFS and CONAPESCA occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles, enforcement cooperation, aquaculture, collaborative research and participation in fisheries related international organizations.		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php http://gulfcouncil.org/fishery_management_plans/shrimp_management.php

[4] GMFMC. *Amendment 5 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.1991. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-05%20Draft%201991-01.pdf

[5] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[6] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[7] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/

[8] NOAA. 2014. *International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries*. http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

12.7 (b) Are they stimulating the research required to support national policies related to fish as food? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Unites States Code, Title 21, Part 123 and Part 110 establish a mandatory seafood inspection program (HACCP) and quality standards for the manufacture, packing and storing of food for human consumption.[1,2] The FDA maintains a Science and Research (Food) Program that continues to advance knowledge regarding potential food hazards, best practices for handling and preparation, and consumer use of foods, including seafood.[3] The FDA conducts seafood testing to ensure safety and has produced several reports on testing of Gulf seafood conducted after the 2010 Deepwater Horizon Oil Spill.		

NOAA also conducts seafood testing, collecting samples of shellfish and sediment from over 60 sites across the GOM to test for chemical and microbial contaminants.[4] The Texas DSHS SALG conducts tissue sampling to determine seafood safety and inspects and certifies processors of shellfish in Texas under 25 T.A.C. Sections 241.1 - 241.9 and Sections 241.50 - 241.71.[5,6,7] The SALG currently has several projects researching health and consumption risks.[8] The USDA is also involved in food safety, security, quality standards, and nutrition.[9] USDA National Institute of Food and Agriculture (NIFA) supports research in many aspects of food and agriculture.[10] The USDA also provides Dietary Guidelines to advise consumers on health eating.[11] The Texas Department of Agriculture Food and Nutrition Division and the Go Texan program support local research in Texas on food and nutrition and economic aspects of Texas seafood. [12,13] The GSMFC ORDP initiatives are currently working to support national policies related to fish as food by addressing Gulf seafood marketing, traceability, sustainability, and seafood safety issues. [14]		

[1] 21 U.S.C. 123 (FDA HACCP regulations)
http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=123

[2] 21 U.S.C. 110 (Federal Food, Drug and Cosmetics Act) http://www.gpo.gov/fdsys/pkg/USCODE-2011-title21/html/USCODE-2011-title21-chap9-subchapIV.htm

[3] "Science and Research (Food)" *U.S. Food and Drug Administration*. Web. Accessed November 2015.
http://www.fda.gov/Food/FoodScienceResearch/default.htm

[4] "Keeping Seafood Safe" *NOAA*. Web. Accessed November 2015.
http://www.noaa.gov/100days/Keeping_Seafood_Safe.html

[5] "Seafood and Aquatic Life Group" *Department of State Health Services (DSHS)*. Web. Accessed June 2015.
http://www.dshs.state.tx.us/seafood/

[7] 25 Tex. Admin. Code § 241
http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=25&pt=1&ch=241&sch=A&rl=Y

[8] 25 Tex. Admin. Code § 241
http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=25&pt=1&ch=241&sch=A&rl=Y

[9] "Seafood and Aquatic Life Group" *Department of State Health Services (DSHS)*. Web. Accessed June 2015.
http://www.dshs.state.tx.us/seafood/

[10] "Food and Nutrition" *U.S. Department of Agriculture*. Web. Accessed June 2015.
http://www.usda.gov/wps/portal/usda/usdahome?navid=food-nutrition

[11] "Research" *National Institute of Food and Agriculture*. Web. Accessed June 2015. http://www.csrees.usda.gov/qlinks/research.html

[12] U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2010.* 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010. http://www.health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf

[13] "Food and Nutrition" *Texas Department of Agriculture*. Web. Accessed June 2015. http://www.squaremeals.org/Home.aspx

[14] "Go Texan" *Texas Department of Agriculture*. Web. Accessed June 2015. http://www.gotexan.org/

[15] "Oil Disaster Recovery Program" *Gulf States Marine Fisheries Commission*. Web. Accessed June 2015. http://www.gsmfc.org/#:content@10:links@11

12.8 (a) Is research being conducted into the study and monitoring of human food supplies from aquatic sources and the environments from which they are taken to ensure that there is no adverse health impact on consumers? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA conducts seafood testing, collecting samples of shellfish and sediment from over 60 sites across the GOM to test for chemical and microbial contaminants.[1] The FDA also has authority to regulate seafood harvest and processing through the Food, Drug and Cosmetics Act and assists states with matters concerning sanitary quality of seafood through the Public Health Services Act.[2,3] At the state level, Texas DSHS SALG is responsible for testing of seafood.[1] DSHS carries out safety testing in several ways- 1) testing of tissue samples in harvest areas and publicizing area closures or consumption advisories if testing indicates any unsafe level of contaminants, 2) certification of shellfish and crab meat processors. [4]		

[1] "Keeping Seafood Safe" *NOAA*. Web. Accessed November 2015. http://www.noaa.gov/100days/Keeping_Seafood_Safe.html

[2] Guillory, V. Perry, H. VanderKooy, S. 2001. *The Blue Crab Fishery of the Gulf of Mexico, United States: A Regional Management Plan*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20096.pdf

[3] "Seafood HACCP" *U.S. Food and Drug Administration*. Web. Accessed November 2015. http://www.fda.gov/Food/GuidanceRegulation/HACCP/ucm2006764.htm

[4] "Seafood and Aquatic Life Group" *Department of State Health Services (DSHS)*. Web. Accessed June 2015. http://www.dshs.state.tx.us/seafood/

12.8 (b) Are results of such research being made publicly available? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
USFDA provides Consumer Updates on seafood through their website and via		

email updates.[1] Texas DSHS publishes advisories on their website and issues news releases regarding consumption advisories.[2] Some consumption advisories are also listed in the Texas Commercial Fishing Guide and on the TPWD website.[3,4]		

[1] "Consumption Advisories" *U.S. Food and Drug Administration*. Web. Accessed November 2015. http://www.fda.gov/forconsumers/consumerupdates/ucm397443.htm

[2] "Current Advisories, Bans, and Rescinded Orders - Seafood and Aquatic Life Group" *Department of State Health Services (DSHS)*. Web. Accessed June 2015. http://www.dshs.state.tx.us/seafood/survey.shtm#advisory

[3] Texas Parks and Wildlife Department, *2015-2016 Texas Commercial Fishing Guide* (TPWD, 2015). http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

[4] TPWD "Fish Consumption Bans and Advisories" *Texas Parks and Wildlife Department*. Web. Accessed June 2015. http://www.tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/fish-consumption-bans-and-advisories

12.10 (a) Are studies on the selectivity of fishing gear, the environmental impact of fishing gear on target species and on the behavior of target and non-target species in relation to such fishing gear being conducted as an aid for management decisions? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Research is being conducted on selectivity of fishing gear and methods and programs are in place to monitor and assess potential impacts of fishing gear on target and non-target species. NOAA's 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 TEDs and BRDs.[1] Current research being conducted by the Harvesting Systems Unit includes new TED designs for use in skimmer trawls. Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[2] These methods include the implementation of an ELB for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition. The NOAA SEFSC Galveston Lab focuses research efforts on fishery management, fishery ecology and protected species with strong emphasis on research pertaining to all aspects of the shrimp fishery.[3] Data are collected on the shrimp fishery through the ELB Program and the Observer Program, managed by the Galveston Lab.[4] Both		

programs became mandatory in 2007 and, if selected, Gulf shrimp permit holders are required to participate in these programs and permit renewal is contingent upon participation. Permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The ELB program collects data on amount and location of shrimp landings. The focus of data collection for the shrimp fishery Observer Program is bycatch and BRD evaluation.[5] The Observer Program evaluates TEDs and bycatch reduction devices (BRDs), quantifies bycatch and characterizes bycatch species composition. The Galveston Lab regularly publishes research on the shrimp fishery and contributes data and research results to the National Observer Program, which also produces reports biannually. Bycatch data from the observer and ELB programs is also utilized by the SEDAR process when conducting stock assessments of other species.[6] The most recent report on shrimp otter trawl bycatch (Scott-Denton et al. 2012) from the Galveston Lab determined that total bycatch to shrimp ratio had decreased to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[7] Characterization of bycatch composition from this report shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*), and sea turtles are also known bycatch species.[8] This bycatch species composition is consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Based on a recent analysis by Raborn et al. (2014) the only species (or species group) that represent 5% or higher in shrimp trawl bycatch are Atlantic croaker, seatrouts, longspine porgy, and inshore lizardfish. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to their populations.[9]

One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[10] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. USFWS and NOAA Office of Protected Resources are responsible for research and assessment of species on the endangered species list and assessments and recovery plans are updated every five years.[11] NOAA is also required to consult on activities that may impact endangered species and has produces several Biological Opinions relating to sea turtles and the shrimp trawl fishery in the Gulf of Mexico. The most recent biological opinion was published in 2014 and authorizes the continued operation of the shrimp trawl fishery.[12] A new consultation (resulting in a biological opinion) is initiated if there is new information or an action is modified that has not previously been considered, or if an incidental take statement is exceeded. Promoting consistency with the ESA and MMPA, and minimizing incidental capture of finfish species are two major objectives of the GMFMC Shrimp FMP.[13]

BOTTOM HABITAT IMPACTS:

Impacts on EFH are assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[14] The initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico Shrimp FMP (brown, white, pink, and royal red). Section 6.1

identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is updated every five years.		

[1] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] "Research" Sou*theast Fisheries Science Center, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/research_home/index.html

[4] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[7] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[8] National Marine Fisheries Service. 2011.

[9] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[10] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[11] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[12] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on 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 under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[13] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[14] "Essential Fish Habitat Amendments" *Gulf of Mexico Fishery Management Council*. Web. Accessed November. 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

12.10 (b) Is an attempt being made through research to minimize non-utilized catches?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Harvesting Systems Unit: The SEFSC Pascagoula Lab contains the Harvesting Systems Unit, which is a team of gear specialists and fishery biologists performing research into critical problems relating to commercial and recreational fishing gear to inform and improve fisheries resource management.[1] The Harvest Systems Unit is responsible for the development, evaluation, certification, and national and international technology transfer of TEDs for trawling gear. The Harvesting Systems Unit is also responsible for the development and assessment of BRDs to reduce finfish bycatch in shrimp trawls. Research on TEDs and BRDs for the shrimp fishery is ongoing with annual testing on new designs of these devices to improve efficiency in reducing bycatch and minimizing shrimp loss and studies are conducted both independently, and in collaboration with commercial shrimpers through cooperative research projects. There are currently several certified designs of both TEDs and BRDs approved by the NOAA.[2,3] Observer Program: NOAA Fisheries monitors bycatch reduction methods and shrimp trawl impacts through an onboard observer program.[4] The Shrimp Bycatch Reduction Device Evaluation Research is an observer program organized and conducted through the Galveston Laboratory. This project consists of onboard monitoring and scientific data analysis. The observer program collects data on bycatch quantity and species composition, and evaluates efficacy of TEDs and BRDs currently in use in the commercial fishery. The fishery observer program was established in 1987 and has helped provide data for evaluating the economic impact of TEDs and BRDs on the shrimping industry. Several studies have also been funded through NOAA's Cooperative Research Fund (CRP) to evaluate bycatch reduction devices in the shrimp trawl fishery including projects by the Gulf and South Atlantic Fisheries Foundation (GSAFF).[5]		

[1] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[2] "TED Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/designs.htm

[3] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] Frank Helies and Judy Jamison (2009) "Reduction Rate, Species Composition, and Effort: Assessing Bycatch Within the Gulf of Mexico Shrimp Trawl Fishery." NOAA/NMFS Cooperative Agreement Number NA07NMF4330125 (#101) http://www.gulfsouthfoundation.org/uploads/reports/101_final4.pdf

12.10 (c) Is the biodiversity of ecosystems and the aquatic habitat being safeguarded?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	There are two overarching considerations for the Texas shrimp fishery with regard to conservation of biodiversity of ecosystems: bycatch and bottom habitat impacts. Substantial progress has been made in minimizing impacts to biodiversity and the ecosystem by the Texas shrimp fishery; however, some areas for potential improvements remain. Refer to responses to 7.2.2 and 7.6.9(a) for full details on bycatch, discards, waste, gear selectivity, endangered and threatened species and habitat impacts.	

12.11 (a) Before the commercial introduction of a new type of gear, is a scientific evaluation of its impact on the fisheries and ecosystems where it will be used being undertaken?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Both state and federal agencies limit the type of gear used within the fishery and new gear types are researched and permitted on a case by case basis. Refer to 8.4.7 response full for details.		

12.11 (b) Is the effect of such gear introduction monitored? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: *Required Reporting:* 50 CFR 622.51 requires fisherman with a Gulf of Mexico Shrimp Permit to submit a Vessel and Gear Characterization Form annually when renewing their permits.[1] The forms allows NOAA to track gear usage and changes in gear type/use. *Observer Program:* NOAA Fisheries monitors bycatch reduction methods and shrimp trawl impacts through an onboard observer program.[2] The Shrimp Bycatch Reduction Device Evaluation Research is an observer program organized and conducted through the Galveston Laboratory. This project consists of onboard monitoring and scientific data analysis. The observer program collects data on bycatch quantity and species composition, and evaluates efficacy of TEDs and BRDs currently in use in the commercial fishery. The fishery observer program was established in 1987 and has helped provide data for evaluating the economic impact of TEDs and BRDs on the shrimping industry. *Resource surveys:* SEAMAP- Gulf of Mexico conducts resource surveys that are used to assess the		

shrimp populations through the Summer and Fall Shrimp/Groundfish Surveys.[3] These surveys provide valuable information not only on shrimp, but also on the common bycatch species typically found in shrimp trawls. Trends in abundance of all species caught in SEAMAP trawls are monitored, and data from these trawls are used in bycatch estimates by NOAA Fisheries. **Texas:** The TPWD trip ticket data collection requires reporting of gear types with landing information allowing TPWD to monitor use of gear types in commercial harvest,[4] and independent sampling programs are able to detect changing trends in coastal resources, associated species and habitats that may be affected by new harvest methods.[5]		

[1] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[4] TPWD. Texas Trip Ticket Procedures Manual. Unpublished document.

[5] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

12.12 Are traditional fisheries knowledge and technologies being investigated and documented, in particular those applied to small-scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
An extensive history of the development of the shrimp fishery has been investigated and documented in the GMFMC shrimp FMP. This FMP has been updated several times and each amendment contains updated information of socio-cultural aspects of the fishery.[1] The 2002 TPWD report to the Governor and the 77th Legislature on the shrimp fishery also contains a history of the fishery and a socioeconomic characterization.[2]		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[9] TPWD, *The Texas Shrimp Fishery*. Report to the Texas Governor and the 77th Legislature. 2002. https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_v3400_857.pdf

12.13 (a) Is the use of research results as a basis for the setting of management objectives, reference points and performance criteria being promoted? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: 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.[1] The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management. National Standard 1 (NS1) requires "*Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."*[2] Current guidelines for NS1 require specification of maximum sustainable yield (MSY) and Optimum Yield (OY), based on the best scientific evidence available, for each fishery managed by the regional councils. Additionally, NS1 requires specification of status determination criteria (SDC) so that overfishing and overfished determinations can be made for stocks in the fishery. National Standard 2 (NS2) requires that "*Conservation and management measures shall be based upon the best scientific information available."*[3] The MSA, section 302(g)(1)(A) requires each regional management council to form a Scientific and Statistical Committee (SSC) to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[4] The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf States. The SSC establishes research priorities based on management needs and submits these to NOAA Southeast Fisheries Science Center (SEFSC).[5] Research is then carried out by SEFSC's various labs and research programs across the Gulf to meet these needs.[6] **Texas:** TPWD CFD conducts scientific monitoring and research directly in support of management and conservation decisions for the coastal resources of Texas. As noted in the AFS peer review conducted in 2005, the CFD "has developed a commendable and scientifically sound annual assessment program."[7] The Science		

and Policy Division of CFD is responsible for designing and overseeing coast-wide assessments and advancing management recommendations based on the results of these assessments. Under the annual review process, biologists from each regional ecosystem unit compile data from independent sampling programs, harvest data, special projects, public concerns and personal observations and make recommendations for potential strategies to ecosystem leaders and program directors.		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[4] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[5] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[6] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[7] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

12.13 (b) Is research being used to help ensure adequate linkages between applied research and fisheries management? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: GMFMC has a Scientific and Statistical Committee (SSC) to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[1] The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf States. The SSC establishes		

research priorities based on management needs and submits these to NOAA Southeast Fisheries Science Center (SEFSC).[2] Research is then carried out by SEFSC's various labs and research programs across the Gulf to meet these needs.[3] **Texas:** The Science and Policy Resources Branch is responsible for coordinating and conducting applied research for statewide concerns and utilizing that research for management recommendatins.[4]		

[1] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[2] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[3] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[4] American Fisheries Society (AFS) "Science Review of the Inland and Coastal Fisheries Divisions, Texas Parks and Wildlife Department." AFS, 2005. http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/afs_fisheries_divisions_science_review_report.pdf

12.14 Are States conducting scientific research activities in waters under the jurisdiction of another State, ensuring that their vessels comply with the laws and regulations of that State and international law? **Yes...**[1] **No...**[0]

Extent of compliance
N/A (not included in scoring)
NOAA does not conduct scientific research in waters under the jurisdiction of another country within the Gulf of Mexico. Texas does not conduct scientific research in waters under the jurisdiction of another state.

12.17 Are States, either directly or with the support of relevant national organizations, developing collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC is one of the regional Fishery Management Councils established by the Fishery Conservation and Management Act of 1976.[1] The GMFMC is a collaboration between NOAA Fisheries and the five Gulf state marine resource management agencies with additional representation from the U.S. Coast Guard, U.S. Fish and Wildlife Service, Department of State, and the Gulf States Marine Fisheries Commission. The GMFMC maintains a Scientific and Statistical Committee (SSC) responsible for providing scientific advice to the GMFMC.[2] The SSC is responsible for advising GMFMC on the adequacy of scientific information		

and analyses for proposed management measures and alternatives. The SSC establishes research priorities based on management needs and submits these to NOAA Southeast Fisheries Science Center (SEFSC).[3] Research is then carried out either by NOAA Fisheries SEFSC's various labs and research programs across the Gulf or through collaboration with each of the five Gulf state resource management agencies.[4] Additionally, GSMFC provides technical and research programs through collaboration between the five U.S. Gulf States to support fisheries management.[5] The SEAMAP and Economic Data programs each provide research support to shrimp fishery management in the Gulf of Mexico.[6,7] GSMFC maintains a Technical Coordinating Committee (TCC), which provides technical and scientific advice to the commission and reviews reports and actions by other GSMFC committees and programs.

International:
There is a shrimp fishery prosecuted in Mexican waters in the Gulf of Mexico, but no formal management body exists across international boundaries. The U.S. and Mexico do collaborate on fishery management issues through the United States-Mexico Fisheries Cooperation Program, which is a bilateral consultative agreement that was informally agreed upon by the U.S National Marine Fisheries Service (NMFS) and the Mexican Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación (SAGARPA) in 1983.[8] Three memoranda of understanding (MOU) have been formalized through this relationship including the MEXUS-Golfo research program. Fishery Cooperation Talks (FCT) between NMFS and Mexico's National Commission of Aquaculture and Fishing (CONAPESCA) occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles, enforcement cooperation, aquaculture, collaborative research and participation in fisheries related international organizations.[9] For the purposes of management and assessments of shrimp, no detailed information is available for shrimp caught and and/or landed in Mexico; therefore, the Gulf of Mexico shrimp stocks are considered from the Mexican border to Florida and assessed accordingly.
The SEFSC Galveston Lab shrimp research program includes a Information Transfer for Shrimp Fisheries' project. This project includes communications with Mexico Fishery Laboratories to enhance data collection and promote global stewardship of resources.[10]

[1] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/about/index.php

[2] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[3] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[4] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[5] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[6] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[7] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[8] Secretaria de Agricultura, Ganaderia, Desaorrollo rural, Pesca y Alimentacion (SAGARPA), 2012. Diario Oficial, Segunda sección, 24 de agosto de 2012. Actualización de la Carta Nacional Pesquera, 236 pp. http://www.inapesca.gob.mx/portal/documentos/publicaciones/CARTA%20NACIONAL%20PESQUERA/24082012%20SAGARPA.pdf

[9] NOAA. 2014. *International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries.* http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

[10] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

APPENDIX A: TEXAS SHRIMP INDUSTRY DISCCUSSION SUMMARY

During the initial development of the Texas Shrimp MAP, G.U.L.F. staff conducted a series of preliminary interviews with active Texas shrimp industry members to gain input directly from the industry on their experiences, concerns and recommendations for the fishery. Below is a summary of concerns and recommendations provided during these interviews. (See Appendix D- Timeline for detail on when/where interviews were conducted).

Texas Shrimp Industry Comments:

- Fear of the unknown- what regulations are coming next that they can't afford
- Price of fuel big increase since 2007 when they started
- Local industry seems happy at the current dock price- they don't want it to get too high because people will start turning away due to cost and they will lose business
- Bigger guys are doing OK, but no one can really get into this business right now- too expensive, not enough profit, especially with only one or two boats
- Safety- major problem still, concern for workers and an insurance issue for boat owners
- 2012- issues with visas (H-2B) - shut out visa workers- for a while, there was an exemption for the fishery in terms of the limit on H-2B visas allowed, but exemption expired and limit was placed on number of visas issued- problems getting workers for boats
- Enforcement consistency
    - Still a problem between agencies and is hurting the industry
- Bottom Impacts:
    - About equivalent to a tropical storm
- Observers
    - Coverage is still low- about 2%
    - Most boats only have 1 crew quarter space, so there are few areas to keep an observer on boats, especially for such long trips- would potentially lose a crew member.
    - Distribution seems uneven- few guys that are regularly required to carry observers
- Bay and Bait shrimp fishery really down in effort, very hard to make a living
    - Many industry members want change to regulations and TPWD is having scoping meeting regarding this
    - Suggestions for regulation changes vary regionally
- Boats with federal licenses cannot cross state waters to Texas ports unless have state license also; however, Texas is limited entry and licenses are not easy to get. Some members of industry (mainly processors) would like to see some sort of unloading permit that allows other boats to land product in Texas.

APPENDIX B: RECOMMENDATIONS PROVIDED BY GLOBAL TRUST CERTIFICATION LTD (GTC)

Taken from the MARINE ADVANCEMENT PLAN (MAP) VERIFICATION REPORT for the Texas Shrimp Fishery:

GTC Ltd has been contracted by Audubon Nature Institute, as an independent assessment body, competent in objective fishery evaluation to provide third-party verification of reports compiled by Gulf United for Lasting Fisheries (G.U.L.F.) for the development of Fishery Marine Advancement Plans (MAPs) in the US Gulf Of Mexico.

The Marine Advancement Plan (MAP) Verification Report provides a detailed evaluation of the Sustainability Benchmarking Report for the **Texas Shrimp Trawl Fishery**, an assessment against FAO criteria according to FAO Circular 917 (Caddy Checklist, 1996) and a draft action plan of recommendations which can form the basis of the MAP for the fishery. The Report confirms any existing gaps (weaker scores) identified in the Sustainability Benchmark Report and identifies any additional areas where the GTC evaluation team considers that further gaps are present.

The following provides a summary of the issue under evaluation for each AMBER or RED rated clause and makes recommendations on the advancement activities that will support closing the gap or resolving the identified issue.

Fishery Recommendations: "No"-rated (0-scoring) clauses

No clauses have been "No"-scored.

Fishery Recommendations: "Some"-rated (1/2-scoring) clauses

RECOMMENDATION 1:

7.2.2 (d) – Has the biodiversity of aquatic ecosystems been conserved (as a result of operation of the fishery in question)?

7.2.2 (g)(iii) - Have selective and environmentally-safe and cost-effective fishing methods been developed?

7.6.9 (a) Are appropriate measures being applied to minimize:

- **(i) - waste and discards?**
- **(ii) - catch of non-target species (both fish and non-fish species)?**
- **(ii) - impacts on associated, dependent or endangered species?**

8.5.1 (a) Where practicable, is there a requirement that fishing gear, methods and practices are sufficiently selective as to minimize waste, discards, catch of non-target species - both fish and non-fish species - and impacts on associated or dependent species and that the intent of related regulations is not circumvented by technical devices and that information on new developments and requirements is made available to all fishers?

12.10 (c) Is the biodiversity of ecosystems and the aquatic habitat being safeguarded?

Summary:
Bycatch is a major concern in shrimp fisheries and there is much controversy among stakeholders on the potential impacts of shrimp trawling on the ecosystem. Managers and fishermen throughout the Gulf of Mexico have cooperated to utilize best-practices for bycatch reduction and continue to collaborate on innovative methods to further reduce bycatch; however, the shrimp industry continues to draw criticism by some due to the continued mortality of some bycatch species. Several regulations have been designed to minimize waste and discards, catch of non-target species, and impacts on associated, dependent or endangered species. However, gear compliance rates can be improved and maintained for optimal reduction of bycatch.

Recommendation:
The rating in this section should improve over time as TED compliance rate remains as high as possible. The observer coverage should be increased in Federal waters, an observer programs should be implemented in Texas waters, and NOAA enforcement activities should be increased. State and Federal agencies shall find solutions regarding inconsistencies in inspection methods and concerns over methods used to determine TED compliance. Also, education, outreach activities shall be maintained helping to increase compliance rates.

RECOMMENDATION 2:

7.2.2 (f) – Environmental impacts: Have adverse environmental impacts on the stocks from human activities been assessed and, where appropriate, rectified?

Summary:
A network of Federal and State agencies as well as numerous NGOs assesses and addresses the human impacts on marine and coastal environments and natural resources both in Texas and across the Gulf region. However there are many impacts which are still under assessment and have not been fully rectified – for example, the 2010 Deepwater Horizon oil spill, the 2014 Galveston oil spill, and the ongoing wetlands loss and pollution caused by coastal population increases.

Recommendation:

The advice of the network of agencies assessing the human impacts on marine and coastal environments and natural resources is implemented and all the current research efforts are supported.

RECOMMENDATION 3:

7.7.3 Are there, where appropriate, in place:
(ii) - observer programs?

8.4.3 (b) Is such an observer and inspection scheme being established in order to promote compliance with applicable (fishery management) measures?

Summary:
The fishery observer program was established in 1987 as a voluntary program through the Gulf and South Atlantic Fisheries Foundation, Inc. (GSAFF) and became cooperative research program in 1992 between GSAFF and NOAA Fisheries. The shrimp FMP amendment 13 made the program mandatory for the Gulf of Mexico shrimp fleet in federal waters. The most recent report from the observer program, published in 2012, indicates that observer coverage is now at about 2% for the Gulf and South Atlantic shrimp fisheries due to decreases in effort in the fishery. Observer coverage through this program only applies to the offshore fleet with federal permits and does not cover inshore state-licensed shrimp trawls. Amendment 13 notes that 5% coverage is typical of standard observer programs; however, the expense of outfitting

the Gulf and South Atlantic shrimp fleet at 5% coverage is too cost prohibitive, and given the current economic condition of the fishery, the industry could not be asked to incur the cost. There is no observer coverage on shrimp vessels in state waters.

Recommendation:

The rating in this section should improve over time as the observer coverage increases in Federal waters, and an observer programs is implemented in Texas waters.

RECOMMENDATION 4:

7.7.3 Are there, where appropriate, in place:

(iv) - vessel monitoring schemes?

Summary:

There is currently no VMS or ELB requirements for shrimp vessels in Texas waters.

Recommendation:

Implement VMS or ELB requirements in Texas waters, or implement surveys to track fishing effort, location and activity.

RECOMMENDATION 5:

8.1.8: Are records of fishers being maintained which should, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws?

Summary:

At Federal level, for vessels of 20 gross tons or more, the master of the vessel must have a written agreement with each crewmember on the terms of employment as a crewmember. Crewmembers must be U.S. citizens, or aliens with legal documentation to work in the U.S. The Captain (Master or individual in charge of the vessel) must be a U.S. citizen.

At the State level, TPWD maintains records of license holders, but no documentation is required for additional crew members. There are no requirements based on competency for entry into the fishery, and no records on competency are maintained.

Recommendation:

The score of this section could be improved with the introduction of record-keeping of crew members other than license holders at the State level. Additionally, competency training in areas such as TED/BRD maintenance for captains and crew, safety regulations, and quality and handling guidelines could improve this scoring.

RECOMMENDATION 6:

8.1.9 Do measures applicable in respect of masters and other officers charged with an offence relating to the operation of fishing vessels include provisions which may permit, *inter alia*, refusal, withdrawal or suspension of authorizations to serve as masters or officers of a fishing vessel?

Summary:

At Federal level, there are no provisions which may permit the refusal or suspension of authorizations to serve as masters or officers of a fishing vessel as a means to enforce federal regulations. However, permits

attached to the fishing vessel itself can be suspended or revoked, as explained in 7.7.2 (c).

Recommendation:
The score of this section could improve with the introduction in the Federal regulations of the refusal or suspension of authorizations to serve as masters or officers of a fishing vessel as a means to enforce regulations.

RECOMMENDATION 7:
8.4.3 (a) Is documentation required with regard to fishing operations, retained catch of fish and non-fish species and, as regards discards, the information required for stock assessment as decided by relevant management bodies, collected and forwarded systematically to those bodies?
(Note: This clause is broken down into 3 scoring responses but the below recommendation is specific to non-fish species, and does not include documentation on retained catch of fish species.)
(ii) - documentation on non-fish catches

Summary:
NOAA Fisheries does not require the direct reporting of non-fish species; however, reporting of interactions with some species is required by the Office of Protected Species. In addition, there is currently no reporting requirement for capture of non-fish species in Texas.

Recommendation:
Development and implementation of a non-fish catches monitoring system at both Federal and State level. Non-fish catch data shall be returned to the management bodies for analysis.

Additional comments

RECOMMENDATION 8:
Although 7.3.3 Plan exists scores "Yes", the reviewer recommends:

- Update the 1989 Texas Shrimp FMP to reflect the significant changes to the industry and the more recent management changes within Texas state waters.

APPENDIX C: Benchmarking Results: Numerical Scoring

See Introduction section for details on the use of the Caddy Checklist and caution regarding numerical scoring.

SUMMARY BY ARTICLE

Article	Best Score Possible	State score	%
7- Fisheries Management	**96**	92	96%
8- Fishing Operations	**32**	29.5	92%
10- Coastal Areas Management	**16**	16	100%
11- Post-Harvest Practices and Trade	**2**	2	100%
12- Fisheries Research	**25**	24.5	98%
total	**171**	164	**96%**

Article 7: Fisheries Management Scorecard

Code Provision	Best Score Possible	State Score	%
7.1 General	22	22	**100%**
7.2 Management Objectives	13	11.5	**79%**
7.3 Management Framework & Purposes	12	12	**100%**
7.4 Data Gathering & Management Advice	9	9	**100%**
7.5 Precautionary Approach	9	9	**100%**
7.6 Management Measures	21	19.5	**97.5%**
7.7 Implementation	10	9	**90%**
Article 7 Overall	**96**	**92**	**96%**

Article 8: Fishing Operations

Code Provision	Best Score Possible	State score	%
8.1 Duties of All States	8	7	**87.5%**
8.2 Flag State duties	5	5	**100%**
8.4 Fishing Operations	13	12	**92%**
8.5 Fishing gear selectivity	6	5.5	**92%**
Article 8 Overall	32	29.5	**92%**

Article 10: Integration of Fisheries into Coastal Area Management

Code Provision	Best Score Possible	State score	%
10.1 Institution framework	6	6	**100%**
10.2 Policy Measures	8	8	**100%**
10.3 Regional cooperation	2	2	**100%**
Article 10 Overall	16	16	**100%**

Article 11: Post-Harvest Practices and Trade

Code Provision	Best Score Possible	State score	%
11.1 Responsible fish utilization	1	1	100%
11.2 Responsible international trade	1	1	100%
Article 10 Overall	2	2	**100%**

Article 12: Fisheries Research

Code Provision	**Best Score Possible**	**State score**	**%**
12.1	3	3	100%
12.2	1	1	100%
12.3	3	3	100%
12.4	2	2	100%
12.5	2	2	100%
12.6	1	1	100%
12.7	2	2	100%
12.8	2	2	100%
12.10	3	2.5	83%
12.11	2	2	100%
12.12	1	1	100%
12.13	2	2	100%
12.14	N/A	N/A	N/A
12.17	1	1	100%
Article 12 Overall	25	24.5	**98%**

APPENDIX D: FAO DEFINITIONS

DEPLETED: A stock driven by fishing at very low level of abundance compared to historic levels, with dramatically reduced spawning biomass and reproductive capacity.

OVERFISHED: When exploited beyond an explicit limit which its abundance is considered "too low" to ensure safe reproduction.

FISHING CAPACTIY: 1. The potential fishing effort that could be exerted in a fishery, over a period of time (year, season) if all fishers are participating and all vessels and gear are fully used. 2. The maximum amount of fish that could be taken in a fishery or by a single fishing unit (e.g. a fisher, community, vessel or fleet) over a period of time (season, year), given the biomass and age structure of the fish stock and the present state of the technology in the absence of any regulated catch limitations and if the means available are fully used. 3. The amount of fishing effort that a fishing boat or a fleet of fishing boats could exert if not constrained by restrictive management measures. 4. The quantity of fish that can be taken by a fishing unit, for example an individual, community, vessel or fleet, assuming that there is no limitation on the yield from the stock (FAO, 1997). Usually expressed in terms of some measure of vessel size, such as gross tonnage, hold capacity, horsepower. Reflects potential rather than nominal fishing effort.

EXCESS CAPACITY: In the short-term, fishing capacity that exceeds the capacity required to capture and handle the allowable catch. In the long-term, fishing capacity that exceeds the level required to ensuring sustainability of the stock and the fishery at the desired level. Fishing capacity in excess of what is required to reach the agreed catch or effort objectives materialized by agreed target reference points (e.g. MSY, F0.1, MEY, etc.)

FISHING EFFORT: The amount of fishing gear of a specific type on the fishing grounds over a given unit of time for example hours trawled per day, number of hooks set per day or number of hauls of a beach seine per day. When two or more kinds of gear are used, the respective efforts must be adjusted to some standard type before being added.

PRECATIONARY APPROACH:
A) The precautionary approach involves the application of prudent foresight, taking into account the uncertainties in fisheries systems and the need to take action with incomplete knowledge. It requires, inter alia, 1) consideration of the needs of future generations and avoidance of changes that are not potentially reversible; 2) prior identification of undesirable outcomes and of measures that will avoid them or correct them promptly; 3) that any necessary corrective measures are initiated without delay and that they should achieve their purpose promptly, on a timescale not exceeding two to three decades; 4) that where the likely impact of resource use is uncertain, priority should be given to conserving the productive capacity of the resource; 5) that harvesting and processing capacity should be commensurate with estimated sustainable levels of resource, and that increases in capacity should be further contained when resource productivity is highly uncertain; 6) all fishing activities must have prior management authorization and be subject to periodic review; 7) an established legal and institutional framework for the fishery management, within which management plans that implement the above points are instituted for each fishery; 8) appropriate placement of the burden of proof by adhering to the requirements above.
B) A set of agreed cost-effective measures and actions, including future courses of action, which ensures prudent foresight, reduces or avoids risk to the resource, the environment and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.

APPENDIX E: G.U.L.F. Texas Shrimp MAP Timeline

June 2014 – Start of Texas Shrimp MAP	
10th	Management meeting, Dickenson, TX, -Met with managers and scientists -Introduced G.U.L.F. and MAP process
11th	Management Meeting, Rockport, TX -Met with TPWD Outreach Specialist and Trip Ticket Coordinator -Introduced G.U.L.F. and MAP process
August 2014	
20th	Management Meeting, Houston, TX -observer public meeting for Texas Parks and Wildlife Commission -many industry members present speaking on the need for change in the Bay and Bait regulations
September-October 2014 – continued research	
November 2014	
17th	Industry meeting, Brownsville, TX -Met with industry group -Many challenges facing the industry, mainly price and competing with imports -Troubles with consistency of TED enforcement -Very interested in sustainability
20th	Industry meeting, Sea Grant. Brownsville, TX -Discussed TED regulations -What goes into a TED boarding -Gear modifications have happened over time, as long as it makes money for the industry or makes their job easier, they're open to it -Discussed educational initiatives Sea Grant has been doing to train fishermen on TED installation
December 2014	
2nd	Industry Meeting: Bay City, TX -Led by TPWD -Scoping meeting to discuss potential changes to Bay and Bait fishery regulations
8th	Industry Meeting: Port Isabel, TX -Led by TPWD -Scoping meeting to discuss potential changes to Bay and Bait fishery regulations
9th	Industry Meeting: Rockport, TX -Led by TPWD -Scoping meeting to discuss potential changes to Bay and Bait fishery regulations
10th	Industry Meeting: Corpus Christi, TX -Led by TPWD -Scoping meeting to discuss potential changes to Bay and Bait fishery regulations
11th	Industry Meeting: Texas City, TX -Led by TPWD -Scoping meeting to discuss potential changes to Bay and Bait fishery regulations
January 2015	
22nd	Management meeting: Austin, TX

	-Attended Texas Parks and Wildlife Commission meeting
23rd	Industry meeting: Austin, TX -Met with manager of Go Texan Shrimp program -Introduced G.U.L.F. and MAPs and discussed potential collaboration
February 2015	
11th	Industry meeting: New Orleans, LA -attended shrimp Fishery Improvement Project roundtable hosted by Sustainable Fisheries Partnership
20th	Industry meeting: Port Arthur, TX -Met with Texas Sea Grant Agent -Discussed experience with shrimp industry in northeastern Texas
25th	Industry meeting: Port Arthur, TX -Met with board members of Port Arthur Area Shrimper's Association -Discussed challenges in the industry -Safety of fishermen Is main concern
March-April 2015 – Continued research and compilation of data	
May-2015	
6th	Industry meeting: Austin, TX -Attended Texas Shrimp Association Annual Meeting
August 2015 – SBR submitted to 3rd party for review	
September 2015 – Finalization of SBR	
October 2015	
5th-7th	Federal Management Meetings: Galveston, TX - Gulf of Mexico Fishery Management Council meeting - Met with NOAA representatives to discuss Observer Program details
November 2015	
2nd-5th	Gulf States Marine Fisheries Commission meeting: St. Augustine, FL - Met with management representatives to discuss status of MAP
March 2016	
6th	Gulf of Mexico Shrimp Supplier Roundtable Meeting (held at Seafood Expo North America) Boston, MA
April 2016	
8th	American Shrimp Processors Association annual meeting: Biloxi, MS - Presented on status of shrimp MAPs in the Gulf
May 2016	
5th	Texas Shrimp Association annual meeting: San Antonio, TX - Presented on status of shrimp MAPs and certification in the Gulf - Met with potential MAP participants to discuss actions for the MAP