8/24/05

FINAL

AMENDMENT NUMBER 13

TO THE

FISHERY MANAGEMENT PLAN FOR THE SHRIMP FISHERY

OF THE GULF OF MEXICO, U.S. WATERS

WITH

ENVIRONMENTAL ASSESSMENT

REGULATORY IMPACT REVIEW, AND

REGULATORY FLEXIBILITY ACT ANALYSIS

AUGUST 2005

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ABBREVIATIONS AND ACRONYMS USED IN THIS DOCUMENT

AP	Shrimp Advisory Panel
APA	Administrative Procedures Act
B	Biomass (Spawning Stock Biomass)
BLS	Bureau of Labor Statistics
BRD	Bycatch Reduction Device
C	Celsius
CEQ	Council on Environmental Quality
ComFIN	Commercial Fisheries Initiative
CPUE	Catch Per Unit Effort
CSAP	Crustacean Stock Assessment Panel
CZMA	Coastal Zone Management Act
DQA	Data Quality Act
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ELB	Electronic Logbook
EO	Executive Order
ESA	Endangered Species Act
F	Fishing Mortality
FEIS	Final Environmental Impact Statement
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FTEV	Full Time Equivalent Vessels
g/l	Grams per liter
GMFMC	Gulf of Mexico Fishery Management Council
GPS	Global Positioning System
GSMFC	Gulf States Marine Fisheries Commission
GSPM	Generalized Surplus Production Model
HAPC	Habitat Areas of Particular Concern
IAI	Impact Assessment, Incorporated
IRFA	Initial Regulatory Flexibility Analysis
km	Kilometers
LOF	List of Fisheries
m	Meters
MBTA	Migratory Bird Treaty Act
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act
MMS	Mineral Management Service
MOU	Memorandum of Understanding
MP	Million Pound
MPA	Marine Protected Area

M-SFCMA	Magnuson-Steven Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NAO	NOAAs Administrative Order
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
OMB	Office of Management and Budget
OY	Optimum Yield
ppm	Parts Per Million
ppt	Parts Per Thousand
PRA	Paperwork Reduction Act
RA	Regional Administrator of NMFS, Southeast Regional Office
RFA	Regulatory Flexibility Analysis/Act
RIR	Regulatory Impact Review
ROD	Record of Decision
SBA	Small Business Administration
SEAMAP	Southeast Area Monitoring and Assessment Program
SEFSC	Southeast Fisheries Science Center of NMFS
SEIS	Supplemental Environmental Impact Statement
SERO	Southeast Regional Office
SIA	Social Impact Assessment
SFA	Sustainable Fisheries Act
SLF	Shrimp Landings File
SRD	Southeast Fisheries Science Center Regional Director
SSAP	Shrimp Stock Assessment Panel
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
TALFF	Total Allowable Level of Foreign Fishing
TED	Turtle Excluder Device
VOUF	Vessel Operating Units File

EXECUTIVE SUMMARY

"Amendment 13 to the Fishery Management Plan (FMP) for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters" proposes to: (1) Establish an endorsement to the existing federal shrimp vessel permit for vessels harvesting royal red shrimp (Action 1); (2) Define maximum sustainable yield (MSY), optimum yield (OY), the overfishing threshold, and the overfished condition for royal red and penaeid shrimp stocks in the Gulf for stocks that currently lack such definitions (Actions 2 through 7); (3) Establish bycatch reporting methodologies and improve collection of shrimping effort data in the exclusive economic zone (EEZ) (Action 8); (4) Require completion of a Gulf Shrimp Vessel and Gear Characterization Form (Action 9); (5) Establish a moratorium on the issuance of commercial shrimp vessel permits (Action 10); and (6) Require reporting and certification of landings during a moratorium (Action 11).

Action 10 would establish a moratorium on the issuance of new commercial shrimp vessel permits, which would be a form of limited access. Section 303 (b) (6) of the Magnuson-Stevens Fishery Conservation and Management Act (M-SFCMA) requires the Council to consider several factors when establishing a limited access system. These factors are discussed in detail in various sections of this amendment, especially in Sections 4.0, 5.0, and 8.0. They are summarized here.

(a) Present participation in the fishery

Prior to the implementation of Amendment 11 (GMFMC 2001) that required commercial shrimp vessels operating in the EEZ to obtain a commercial shrimp vessel permit, it was estimated that approximately 4,000 vessels fished in the EEZ at least some portion of the year. An estimated 2,951 vessels obtained a permit sometime within the period from implementation of Amendment 11 (December 2002) and May 5, 2005. Currently it is estimated that there are approximately 2,600 active permits, and economic projections indicate that primarily due to high fuel costs and competition with imports the number of vessels participating in the Gulf shrimp fishery will continue to decline until at least 2012. Consequently, the expected decrease in participation is not the result of implementation of a moratorium, but rather the economic climate of the fishery. Furthermore, as with the reef fish and king mackerel fisheries, permits under the moratorium would be fully transferable. Consequently, persons wishing to enter the fishery could freely do so by finding a willing seller from whom they could purchase a permit.

(b) Historical fishing practices and the dependence on the fishery

Impacts to historical fishing practices and dependence on the shrimp fishery have occurred from competition with imports, particularly since pond raised shrimp were introduced in the 1980s. This competition has escalated substantially since approximately 2001 with prices so low that many vessels have been forced out of the fishery. As stated in (a) above, these impacts have resulted from economic conditions within the fishery that would not be changed as a result of implementation of a moratorium.

(c) Economics of the fishery

As discussed in Sections 4.0 and 5.0 herein, the economics of the shrimp fishery have been dramatically affected as a result of high fuel costs and competition with imported shrimp. These factors have resulted in very low prices for shrimp that have been good for the consumers, but they have forced many vessels in the commercial fishery to cease operations due to nonprofitability. Again, these impacts have resulted from factors not related to the imposition of a moratorium, and such action is not likely to change the economic climate in the near future.

(d) Capability of vessels in the fishery to engage in other fisheries

Most of the vessels in the offshore shrimp fishery in the Gulf are large (from 60 to 90 feet in length). Consequently, they would probably not be able to operate profitably in other fisheries in the Gulf with the possible exception of the pelagic longline fishery that is also under a permit moratorium. The other major species in the reef fish and coastal migratory pelagics fisheries are less profitable than shrimp and they are governed by trip limits, hard quotas, and permit moratoria that would preclude these large vessels from entering these fisheries. As a result of the economic conditions in the shrimp fishery, some vessels have been sold or otherwise left the shrimp fishery and entered other fisheries on the east coast of the U.S. and other countries. On the other hand many vessels remain idle because they cannot operate profitably under the present price structure. It is currently unknown as to whether and to what extent these vessels will be able to reenter the shrimp fishery if prices improve or enter other fisheries in other areas.

(e) Cultural and social framework relevant to the fishery and any affected fishing communities

As discussed in Sections 4.0, 5.0, and 8.0, the impacts to the social environment and to fishing communities that rely on shrimp have been heavily impacted from high fuel costs and competition from imports since approximately 2001. These impacts are expected to continue until approximately 2012 when the number of vessels is expected to stabilize at a level such that profitability is restored. The institution of a moratorium is not expected to change these impacts and may in the future provide some protection for the individuals and communities remaining against a return to nonprofitable conditions as a result of new entrants.

(f) Other relevant considerations

There would be no other relevant considerations from the implementation of a moratorium on the issuance of new commercial shrimp vessel permits.

FISHERY IMPACT STATEMENT

Regulations impose restrictions on fishery participants, which can result in adverse effects on fishermen and fishing communities. "Amendment 13 to the Fishery Management Plan (FMP) for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters" proposes to: (1) Establish an endorsement to the existing federal shrimp vessel permit for vessels harvesting royal red shrimp (Action 1); (2) Define maximum sustainable yield (MSY), optimum yield (OY), the overfishing threshold, and the overfished condition for royal red and penaeid shrimp stocks in the Gulf for stocks that currently lack such definitions (Actions 2 through 7); (3) Establish bycatch reporting methodologies and improve collection of shrimping effort data in the exclusive economic zone (EEZ) (Action 8); (4) Require completion of a Gulf Shrimp Vessel and Gear Characterization Form (Action 9); (5) Establish a moratorium on the issuance of commercial shrimp vessel permits (Action 10); and (6) Require reporting and certification of landings during a moratorium (Action 11).

Each proposed action is expected to have a positive, albeit insignificant, long-term effect on the human environment. Establishing a royal red shrimp endorsement to the existing commercial shrimp vessel permit would provide a readily accessible database from which to identify participants in this fishery and help to provide stability in the royal red shrimp fishery by limiting participation to current participants in the Gulf EEZ commercial food shrimp fishery. Reviewing, revising or defining, as needed, biological reference points and status determination criteria definitions for the royal red and penaeid shrimp stocks would provide fishery scientists and managers with management targets and thresholds, and help to bring the Shrimp FMP into full compliance with the M-SFCMA. Establishing a standardized bycatch reporting methodology would help fishery managers to better determine and monitor the type and amount of bycatch occurring in the shrimp fishery, and bring the Shrimp FMP into compliance with the applicable provisions of the M-SFCMA. Requiring fishery participants to submit a vessel and gear characterization form will allow managers to establish random sampling designs for the various data collection programs, help to provide information similar to that collected under paper logbooks, but at a much reduced time burden for the industry, and assist with the development of fishery performance measures critical to the long-term management of the fishery. Establishing a moratorium on the issuance of new federal shrimp vessel permits would prevent new entrants in the Gulf EEZ shrimp fishery. The Gulf EEZ shrimp fishery is expected to become more profitable in the future, as current predictions estimate a reduction in effort due to economic hardship related to reduced prices for shrimp from competition with imports and high fuel costs. Limiting the number of participants in the fishery will improve the economic well-being of those permitted to operate in the fishery as this recovery occurs. Transferability of the permits under the moratorium will allow for mutually beneficial exchanges of resources in the industry and thereby promote economic efficiency. Finally, requiring fishery participants to report and certify landings during a moratorium will provide data and information on each vessel's level of participation in the fishery that could be useful in establishing a long-term limited access or effort management program if such is determined to be needed in the future.

The proposed actions in this amendment would likely not impose significant impacts on the vast majority of fishery participants. Preferred Alternative 1.C under Action 1 would help improve the

use of data from the royal red shrimp vessels through establishment of an endorsement to the existing Gulf shrimp permit. This would have no effect on fishing for the current 14 vessels that operate in the royal red shrimp fishery, and minimal economic effect as a result of having to pay for the endorsement ($20). Although Alternative 1.B, which would require a separate royal red shrimp permit, would achieve the same end, the primary benefit of Preferred Alternative 1.C over Alternative 1.B is that it would enhance economic stability in the royal red shrimp fishery by limiting participation to vessels that qualify for permits under the moratorium (Action 10). Alternative 1.B would allow vessels that do not currently qualify for a moratorium permit to enter the royal red shrimp fishery, thereby potentially destabilizing this fishery.

Actions 2 through 7 would establish definitions for MSY, OY, overfishing and the overfished condition of shrimp stocks that do not currently have approved definitions, as required by law. The establishment of these definitions would not effect fishing, unless future action is taken as a result of these targets and thresholds being exceeded, or, in the case of the royal red shrimp fishery, if the fishery were to expand. Neither event is expected to occur given current economic conditions. None of the alternatives under these Actions would have direct impacts on fishery participants.

Action 8 would only have impacts on fishing operations if, under Alternative 8.C., the carrying of observers resulted in reduced fishing time, which is not expected. The Council chose to require observers for only a statistically valid sample of permitted vessels (Preferred Option 3) as opposed to relying on the existing voluntary observer and other data collection programs (Option 2). The primary advantage of a mandatory observer program over a voluntary program is that a mandatory system imparts statistical validity of the effort, bycatch, and other estimates of fishery performance. The industry will not have to pay for the costs of implementing and administering the observer program. The Council chose not to require paper logbooks for any fishery participants (Preferred Option 1 under Alternative 8.A). The time burden on the industry as a result of requiring paper logbooks would have been significant under Option 2, wherein all permitted vessels would have been required to submit logbooks on all trips, though the burden would have been less under Option 3, wherein only a statistically valid sample of vessels would have been required to submit logbooks. With respect to electronic logbooks, Alternative 8.B, the Council decided to not require the industry to pay for the units, and require they be utilized only by a statistically valid sample of the permitted vessels (Preferred Option 3). This would reduce the inconvenience on the industry of requiring all vessels to carry the units (Option 2).

Action 9 would not affect fishing operations and would only require vessel permit holders to complete a vessel and gear characterization form annually. Consequently, the only impact would be the time burden associated with filling out the form once a year, estimated to be 30 minutes, and would, therefore, be insignificant.

Action 10 would implement a moratorium on the issuance of new commercial shrimp vessel permits. Although 285 currently permitted vessels would not qualify for a moratorium permit under Preferred Alternative 10.B, of the 2,951 currently permitted vessels, only 72 vessels that were active in the EEZ (i.e., had landings from EEZ waters in 2002) would not be issued a permit when the moratorium is implemented. Additionally, these vessels could probably purchase a permit if desired. The initial cost to purchase a permit is estimated to be about $5,000 on average,

which is likely a less costly option for most of these 72 vessels compared to significantly altering (shifting to other fisheries) or ceasing operations. Thus, negative impacts are expected to be insignificant for the vast majority of current participants in the EEZ fishery. However, the expected, adverse impacts would be less under Alternative 10.C., wherein only 161 currently permitted vessels would not be issued a moratorium permit and, of those, only 47 were active in the EEZ. Conversely, current information suggests that the impacts would be much greater under Alternative 10.D., wherein 347 currently permitted vessels would not be issued a moratorium permit and, of those, 187 vessels were active in the EEZ. Impacts on harvesters, dealer/wholesalers, processors, and communities are expected to be much more severe under Alternative 10.D, and more concentrated in particularly vulnerable communities, than under Preferred Alternative 10.B and Alternative 10.C. These conclusions must be somewhat qualified due to the uncertainty regarding vessels that may or may not renew or purchase their permits prior to the publication date of the final rule that will implement this amendment. Should all of the vessels that did not renew their permits in calendar year 2005 do so before the final rule's publication date or if new permits are purchased, then no previously permitted vessels would be excluded and thus there would be no known short-term, adverse economic impacts under Alternative 10.D. In that instance, Alternative 10.D would yield lower short-term, adverse economic impacts than Preferred Alternative 10.B and Alternative 10.C, and thus would be the alternative that minimizes such impacts and thereby generate the greatest net economic benefits in the long-term. However, it is also possible that none or only some of the vessels will renew their permits, particularly since most are likely large vessels that have been repossessed and are thus unlikely to renew their permits in the near future, if at all. Under this scenario, the majority of the estimated impacts would occur, which again would lead to the conclusion that Alternative 10.D would generate lower net economic benefits relative to Preferred Alternative 10.B and Alternative 10.C.

Finally, Action 11 would require vessels to report and certify their landings to the National Marine Fisheries Service (NMFS). Such a requirement would impose minimal impacts, if any, because such reporting is already required if a vessel owner or operator is called upon to report and it is expected that most vessel owners already compile this information as customary business practice in conjunction with running their fishing operation. Furthermore, any inconvenience could be ameliorated by adding this required information to an existing or proposed data collection program/form, such as the vessel/gear characterization form under Action 9.

A more detailed analysis of the impacts to participants and their communities relative to the alternatives for this action is found in Sections 5.0 and 8.0 herein.

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Environmental Assessment (EA) Cover Sheet

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Name of Action
Amendment 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters.

Type of Action
(X) Administrative
() Draft

Summary

This amendment proposes to: (1) Establish an endorsement to the existing federal shrimp vessel permit for vessels harvesting royal red shrimp (Action 1); (2) Define maximum sustainable yield (MSY), optimum yield (OY), the overfishing threshold, and the overfished condition for royal red and penaeid shrimp stocks in the Gulf for stocks that currently lack such definitions (Actions 2 through 7); (3) Establish bycatch reporting methodologies and improve collection of shrimping effort data in the exclusive economic zone (EEZ) (Action 8); (4) Require completion of a Gulf Shrimp Vessel and Gear Characterization Form (Action 9); (5) Establish a moratorium on the issuance of commercial shrimp vessel permits (Action 10); and (6) Require reporting and certification of landings during a moratorium (Action 11).

Each proposed action is expected to have a positive, albeit insignificant, long-term effect on the human environment. Establishing an endorsement to the existing commercial shrimp vessel permit would provide a readily accessible database from which to identify participants in this fishery. Reviewing, revising or defining, as needed, biological reference points and status determination criteria definitions for the royal red and penaeid shrimp stocks would

provide fishery scientists and managers with management targets and thresholds, and help to bring the Shrimp FMP into full compliance with the M-SFCMA. Establishing a standardized bycatch reporting methodology would help fishery managers to better determine and monitor the type and amount of bycatch occurring in the shrimp fishery, and bring the Shrimp FMP into compliance with the applicable provisions of the M-SFCMA. Establishing a moratorium on the issuance of new federal shrimp vessel permits would prevent new entrants in the shrimp fishery with the expectation that the fishery will become more profitable in the future, as current predictions estimate a reduction in effort due to economic hardship related to reduced prices for shrimp from competition with imports and high fuel costs. Finally, requiring fishery participants to report and certify landings during a moratorium would provide data and information on each vessel's level of participation in the fishery that could be useful in establishing a long-term limited access or effort reduction programs if such are determined to be needed in the future.

Filing Dates with EPA

Notice of Intent to prepare DSEIS published in Federal Register: 8/19/02 (67 FR 53769). Amended Notice of Intent to prepare DSEIS published in Federal Register: 9/12/02 (67 FR 57785).

Notice of change to an Environmental Assessment (EA) published in Federal Register: 10/3/03 (68 FR 57400).

1.0 INTRODUCTION

General Information:

The species of shrimp managed under the Shrimp FMP are as follows:

Brown shrimp	*Farfantepenaeus aztecus*
White shrimp	*Litopenaeus setiferus*
Pink shrimp	*Farfantepenaeus duorarum*
Royal Red shrimp	*Hymenopenaeus robustus*

The three species of penaeid shrimp comprise more than 99% of the landings in the Gulf of Mexico shrimp fishery. In recent years, average annual landings have been approximately 150.0 million pounds (MP) (tails). Brown shrimp provide the largest portion of annual shrimp landings in the northern Gulf with average landings in the 1990's of approximately 80.0 MP. This species is distributed from the Mexican border through Apalachicola Bay, Florida (GMFMC 1981). Brown shrimp are caught out to at least 50 fathoms, though most catches are taken from less than 30 fathoms. White shrimp are the second most abundant species with 1998 and 1999 landings of approximately 55.0 MP and 2000 landings of over 70.0 MP. They are distributed from the Mexican border through Apalachee Bay (Figure 11, GMFMC 1998). Typically, white shrimp are caught inshore of 15 fathoms. Pink shrimp landings were approximately 19.0 MP in 1996, but dropped to only about 8.0 MP in 1999 and 7.0 MP in 2000. This species is distributed across the northern Gulf from the Florida Keys to Mexico; however, they are most common in the Tortugas and Sanibel areas off Florida (GMFMC 1980). Pink shrimp are usually taken from waters less than 25 fathoms with the majority of catch being harvested in 11 to 15 fathoms. Maximum annual production of royal red shrimp has been on the order of 337,000 pounds (tails) in 1994; however, landings in recent years (1998, 1999, and 2000) have only been around 245,000 to 299,000 pounds. Royal red shrimp are a deep-water shrimp occurring primarily in depths of 140 to 300 fathoms.

Status of the Stocks

The Magnuson-Stevens Fishery Conservation and Management Act (M-SFCMA) requires that each FMP define biological reference points in the form of maximum sustainable yield (MSY) and optimum yield (OY), and specify objective and measurable status determination criteria for identifying when the fishery is overfished and/or undergoing overfishing. Stock status determination criteria are to include a minimum stock size threshold (MSST) and a maximum fishing mortality threshold (MFMT). MSST represents the threshold biomass level below which a stock would not be expected to be capable of rebuilding to the biomass (B) required to produce MSY (B_{MSY}) within ten years if exploited at MFMT. MFMT represents the maximum level of fishing mortality rate (F) that a stock can withstand while still producing MSY on a continuing basis (F_{MSY}).

By evaluating stock biomass (B) and fishing mortality rate (F) in relation to MSY, OY, MSST and MFMT, fishery managers can determine the status of a fishery at any given time and assess

whether management measures are achieving established goals to maintain healthy stocks and provide an optimum yield from the fishery. Fishery managers use the parameters MSST and MFMT to monitor the current level of biomass ($B_{CURRENT}$) and rate of fishing mortality ($F_{CURRENT}$) in a fishery in relation to B_{MSY} and F_{MSY}. A fishery experiencing a fishing mortality rate that exceeds the MFMT (e.g., $F_{CURRENT}$ > MFMT) would be considered undergoing overfishing. A stock with a biomass below the MSST (e.g., $B_{CURRENT}$ < MSST) would represent a biomass level, which at a minimum, is no lower than $0.5*B_{MSY}$.

These parameters (MSY, OY, MSST, MFMT) are difficult to apply to shrimp stocks because they are short-lived (essentially annual crops) and because the year-class strength of shrimp populations is influenced primarily by environmental factors rather than by catch rates. Thus, regulation of fishing effort has not been demonstrated to affect the long-term sustainability of these populations unless the spawning stock has been reduced below a minimum threshold level by environmental conditions. The M-SFCMA does not provide specific guidance on how to define management reference points that recognize the influence of environmental factors on population trends.

Nevertheless, the National Standard Guidelines (50 CFR 600.310[c][2][I]) identify alternatives for establishing MSY to include removal of a constant catch each year that allows the stock size to remain above an identified lower level, or to allow a constant level of parent stock escapement each year. For penaeid (brown, pink, and white) shrimp stocks, it is appropriate to establish an MSY control rule relating 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. In other words, this would be an MSY control rule that relies on constant escapement of B_{MSY}.

To that end, the Gulf of Mexico Fishery Management Council (Council or GMFMC) has established an overfishing level for each of the three penaeid species in terms of a parent stock level, as follows, and an overfished condition as one half of these parent stock levels:

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.

Pink Shrimp - 100 million individuals, age 5+ months during the July through June year.

The National Marine Fisheries Service (NMFS) has monitored the parent stock levels for all three penaeid species since 1970. Since 1991, NMFS has monitored the status of the shrimp stocks using the methodology of Nance et al. (1989), and Klima et al. (1990), as modified by the Shrimp Stock Assessment Panel (SSAP 1993) for white shrimp. The parent stock numbers for all three penaeid species have remained above the overfishing threshold throughout this monitoring period. These stocks are not considered overfished or undergoing overfishing.

However, the existing definitions of MSY and OY for penaeid stocks are not consistent with the regulations at 50 CFR 600.310 because they do not specify a yield.

Biological reference points and stock status criteria for royal red shrimp differ from those of the penaeid species; data, and the associated benchmarks, are limited to catch. Currently, the Council has established an MSY, OY, and overfishing definition, but has no overfished definition. The yield from the royal red shrimp fishery has remained below the established MSY yield level of 392,000 to 650,000 pounds. Consequently, the royal red shrimp stock of the Gulf of Mexico is not considered to be undergoing overfishing.

Actions Considered in this Amendment

Considerations for establishing a separate vessel permit for the royal red shrimp fishery or an endorsemen

This amendment considers whether there is a need to establish a separate vessel permit or an endorsement to the existing shrimp vessel permit for vessels targeting royal red shrimp in the EEZ of the Gulf of Mexico. Royal red shrimp are an extremely small component of the shrimp fishery in the Gulf . Only approximately 10 out of over 2,600 vessels have landings of royal red shrimp in a given year, and catches come from a very limited geographic area. Data on this fishery are limited to primarily landings, and there is a need to collect additional information on areas fished, effort, catch per unit effort (CPUE), markets, value, etc. Much of this information could be established through reporting requirements under the existing shrimp vessel permits; however, a separate permit/endorsement would provide a more accurate and readily accessible database from which to sample the various aspects of this fishery.

Consideration of definitions for MSY, OY, the overfishing threshold, and the overfished condition for royal red and penaeid shrimp stocks in the Gulf

The M-SFCMA and the NMFS' Guidelines for National Standard 1 of the M-SFCMA require the Council to establish definitions for MSY, OY, the overfishing threshold, and the overfished condition for the stocks that are managed. The Council submitted proxy definitions for these parameters as part of its Generic Sustainable Fisheries Act Amendment in 1999; however, only the definitions of the overfishing and overfished condition of penaeid stocks, and the MSY and OY definitions for royal red shrimp were approved by the NMFS. The Council did not submit a definition of the overfished condition of the royal red shrimp stock in the Gulf. Consequently, revised definitions are being considered for all disapproved definitions and additional alternatives are being considered for the overfished condition of the royal red shrimp stock.

Consideration of alternatives to establish bycatch reporting methodologies and improve collection of shrimping effort data in the EEZ

Section 303 (a)(11) of the M-SFCMA requires the Council to establish a standardize bycatch reporting methodology to determine the type and amount of bycatch occurring in the shrimp fishery. The Council proposed such a methodology under Amendment 10 to the Shrimp FMP that utilized data from the Southeast Area Monitoring and Assessment Program (SEAMAP). The use of the SEAMAP data was criticized as not reflecting bycatch from commercial shrimping operations, primarily because it is collected by research trawls (without turtle excluder devices [TEDs] and bycatch reduction devices [BRDs]) and is conducted during daylight hours. The commercial shrimp fishery primarily operates at night and is required to use both TEDs and BRDs. The Council is now considering ways to improve this reporting methodology and to gather more accurate effort data in order to better estimate bycatch from the shrimp fishery of the Gulf.

Consideration of Alternatives for completion of a Gulf Shrimp Vessel and Gear Characterization Form

This amendment considers whether to require completion of a Gulf Shrimp Vessel and Gear Characterization Form by all permitted shrimp vessels or a selected subset of permitted vessels as a condition for receiving or renewing a federal shrimp vessel permit. This information is needed in order to determine the amount and type of gear used in the fishery. In turn, this information will enhance analyses of effort, bycatch, and operating costs. The database could also be used as a universe for future characterization studies.

Consideration of a Moratorium on the Issuance of Commercial Shrimp Vessel Permits

This amendment considers alternatives to establish a moratorium on the issuance of new commercial shrimp vessel permits based on 4 dates prior to which a vessel would have to have obtained a valid commercial shrimp vessel permit. Since approximately 2001 vessels have been exiting the shrimp fishery because of low shrimp prices from competition with imports and high fuel costs. Economic projections predict a decrease in effort through the year 2012. A shrimp vessel permit moratorium would prevent new entrants in the shrimp fishery with the expectation that the fishery will become more profitable in the future as the number of participating vessels declines, and the fishery again becomes profitable.

Consideration of Requiring Reporting and Certification of Landings During a Moratorium

This amendment considers requiring federally permitted shrimp vessels to report and certify the accuracy of their landings during a moratorium. This information may be needed in the future if it is determined that further reductions in the fleet are needed via a long-term limited access or effort reduction program.

2.0 HISTORY OF MANAGEMENT

The Shrimp FMP, supported by an Environmental Impact Statement (EIS), was implemented on May 15, 1981. The FMP defined the Shrimp Fishery Management Unit to include brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*), pink shrimp (*Farfantepenaeus duorarum*), royal red shrimp (*Hymenopenaeus robustus*), seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*). The actions implemented through the FMP and its subsequent amendments, have addressed the following objectives:

1. Optimize the yield from shrimp recruited to the fishery.
2. Encourage habitat protection measures to prevent undue loss of shrimp habitat.
3. Coordinate the development of shrimp management measures by the Gulf of Mexico Fishery Management Council (Council or GMFMC) with the shrimp management programs of the several states, where feasible.
4. Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act.
5. Minimize the incidental capture of finfish by shrimpers, when appropriate.
6. Minimize conflict between shrimp and stone crab fishermen.
7. Minimize adverse effects of obstructions to shrimp trawling.
8. Provide for a statistical reporting system.

The principal thrust of the plan was to enhance yield in volume and value by deferring harvest of small shrimp to provide for growth. Principle actions included: (1) establishing a cooperative Tortugas Shrimp Sanctuary with the state of Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time; (2) a cooperative 45-day seasonal closure with the state of Texas to protect small brown shrimp emigrating from bay nursery areas; and (3) seasonal zoning of an area of Florida Bay for either shrimp or stone crab fishing to avoid gear conflict.

Amendment 1, supported by an Environmental Assessment (EA), was approved later that year. This amendment provided the Regional Administrator (RA) of the NMFS Southeast Regional Office with the authority (after conferring with the GMFMC) to adjust by regulatory amendment the size of the Tortugas Sanctuary or the extent of the Texas closure, or to eliminate either closure for one year.

Amendment 2/EA (1983), updated catch and economic data in the FMP. **Amendment 3/EA** (1984) resolved another shrimp-stone crab gear conflict on the west-central coast of Florida.

Amendment 4/EA, partially approved in 1988 and finalized in 1989, identified problems that developed in the fishery and revised the objectives of the FMP accordingly. The annual review process for the Tortugas Sanctuary was simplified, and the GMFMC's and RA's review for the Texas closure was extended to February 1st. A provision that white shrimp taken in the exclusive economic zone (EEZ) be landed in accordance with a state's size/possession regulations to provide consistency and facilitate enforcement with the state of Louisiana was to

have been implemented at such time when Louisiana provided for an incidental catch of undersized white shrimp in the fishery for seabobs. This provision was disapproved by the NMFS with the recommendation that it be resubmitted under the expedited 60-day Secretarial review schedule after Louisiana provided for a bycatch of undersized white shrimp in the directed fishery for seabobs. This resubmission was made in February of 1990 and applied to white shrimp taken in the EEZ and landed in Louisiana. It was approved and implemented in May of 1990.

In July 1989, the NMFS published revised guidelines for FMPs that interpretatively addressed the M-SFCMA's (then called the Magnuson Fishery Conservation and Management Act) National Standards (50 CFR Part 602). These guidelines required each FMP to include a scientifically measurable definition of overfishing and an action plan to arrest overfishing should it occur.

In 1990, Texas revised the period of its seasonal closure in Gulf waters from June 1 to July 15 to May 15 to July 15. The FMP did not have enough flexibility to adjust the cooperative closure of federal waters to accommodate this change, thus an amendment was required.

Amendment 5/EA, approved in 1991, defined overfishing for Gulf brown, pink, and royal red shrimp and provided for measures to restore overfished stocks if overfishing should occur. Action on the definition of overfishing for white shrimp was deferred, and seabobs and rock shrimp were deleted from the management unit. The duration of the seasonal closure to shrimping off Texas was adjusted to conform with the changes in state regulations.

Amendment 6/EA (1993), eliminated the annual reports and reviews of the Tortugas Shrimp Sanctuary in favor of monitoring and an annual stock assessment. Three seasonally opened areas within the sanctuary continued to open seasonally, without need for annual action. A proposed definition of overfishing of white shrimp was rejected by the NMFS as not being based on the best available data.

Amendment 7/EA, finalized in 1994, defined overfishing for white shrimp and provided for future updating of overfishing indices for brown, white, and pink shrimp as new data become available. A total allowable level of foreign fishing (TALFF) for royal red shrimp was eliminated; however, a redefinition of overfishing for this species was disapproved.

Amendment 8/EA, submitted in 1995 and implemented in early 1996, addressed management of royal red shrimp. It established a procedure that would allow total allowable catch (TAC) for royal red shrimp to be set up to 30% above MSY for no more than two consecutive years so that a better estimate of MSY could be determined. This action was subsequently negated by the 1996 Sustainable Fisheries Act (SFA) amendment to the M-SFCMA that defined overfishing as a fishing level that jeopardizes the capacity of a stock to maintain MSY, and does not allow OY to exceed MSY.

Amendment 9, supported by a Supplemental Environmental Impact Statement (SEIS) and implemented in 1998, required the use of a NMFS certified bycatch reduction devices (BRDs)

in shrimp trawls used in the EEZ from Cape San Blas, Florida (85°30' W. Longitude) to the Texas/Mexico border, and provided for the certification of the Fisheye BRD in the 30 mesh position. The purpose of this action was to reduce the bycatch mortality of juvenile red snapper by 44% from the average mortality for the years 1984-89 (F=2.06). This amendment exempted shrimp trawls fishing for royal red shrimp outside of 100 fathoms, as well as groundfish and butterfish trawls. It also excluded small try nets and no more than two ridged frame roller trawls that do not exceed 16 feet. Amendment 9 also provided mechanisms to change the bycatch reduction criterion and to certify additional BRDs.

Amendment 10/EA, approved in 2004, required BRDs in shrimp trawls used in the Gulf east of Cape San Blas, Florida (85°30' W. Longitude). Certified BRDs for this area are required to demonstrate a 30% reduction by weight of finfish.

Amendment 11/EA, which was fully implemented in December 2002, required owners and operators of all vessels harvesting shrimp from the EEZ of the Gulf to obtain a federal commercial vessel permit. This amendment also prohibited the use of traps to harvest royal red shrimp from the Gulf of Mexico and to transfer royal red shrimp at sea.

Amendment 12/EA, was included as part of the Generic Essential Fish Habitat (EFH) Amendment that established EFH for shrimp in the Gulf.

3.0 PURPOSE AND NEED FOR ACTION

The royal red shrimp fishery in the Gulf of Mexico is a very small component of the overall shrimp fishery, and there are very limited data on this fishery on which to make management decisions. Consequently, there is a need to collect additional information on areas fished, effort, CPUE, markets, value, etc. This amendment proposes alternatives for a separate royal red shrimp vessel permit or an endorsement to the existing commercial shrimp vessel permit in order to provide a readily accessible database from which to identify participants in this fishery. Having such a database will allow managers and scientists to gather additional biological, social, and economic data in order to appropriately manage this fishery where and when warranted.

The M-SFCMA requires that each FMP define reference points in the form of MSY and OY, and specify objective and measurable criteria for identifying when the fishery is overfished and/or undergoing overfishing. Status determination criteria are defined by 50 CFR 600.310 to include a minimum stock size threshold (MSST) and a maximum fishing mortality threshold (MFMT). Together, these four parameters (MSY, OY, MSST and MFMT) are intended to provide fishery managers with the tools to measure the status and performance of each stock in the fishery management unit.

The Council submitted proxy definitions for these parameters as part of its Generic Sustainable Fisheries Act Amendment in 1999; however, only the definitions of the overfishing and overfished condition of penaeid shrimp stocks, and the MSY and OY definitions for the royal red shrimp stock were approved by the NMFS. The Council did not submit a definition of the

overfished condition of the royal red shrimp stock in the Gulf. Consequently, definitions of overfishing and the overfished condition for royal red shrimp, as well as MSY and OY definitions for the brown, white, and pink shrimp stocks are needed to comply with applicable law. Establishing appropriate definitions for MSY, OY, the overfishing threshold, and the overfished condition for all managed shrimp stocks, as required by the M-SFCMA, will provide guidance to the Council as to what management measures may be needed to optimize yield. They will also provide thresholds upon which the Council can judge whether a stock is undergoing overfishing or has become overfished that in turn will be used to develop management measures to halt overfishing (if occurring) and to rebuild overfished stocks (if such a determination is made).

Section 303 (a)(11) of the M-SFCMA requires the Council to establish a standardize bycatch reporting methodology to determine the type and amount of bycatch occurring in the shrimp fishery. The proposed methodology in Amendment 10 to the Shrimp FMP, using Southeast Area Monitoring and Assessment Program (SEAMAP) data as extrapolated by NMFS' effort data, was criticized as not accurately reflecting actual bycatch and was subsequently disapproved. Consequently, there is a need to develop a more accurate means of determining the overall amount and type of bycatch that is being taken by the shrimp fishery. This information is needed in order for the Council to monitor compliance with National Standard 9 of the M-SFCMA that states: "conservation and management measures shall to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." The BRD requirements proposed by the Council and implemented by NMFS through Amendments 9 and 10 to the Shrimp FMP are intended to achieve this bycatch minimization mandate. However, continued data collection and monitoring of the amount and type of bycatch occurring in the fishery would assist the Council in determining whether and what type of additional actions are needed to reduce bycatch, by how much, and the most appropriate means.

There is currently only limited information on vessels and the amount and type of gear being used in the offshore shrimp fishery. This information is needed in order to determine effort and bycatch as well as operating costs. It is also needed to obtain a stratified universe for further studies on characterization of the fleet. Although some of the logbook alternatives would provide such information as part of a bycatch reporting methodology, a potentially simpler approach would be to provide such information on an annual basis when renewing the vessel permit.

The shrimp fishery in the Gulf has been experiencing economic losses since approximately 2001 primarily due to reduced prices from competition with imports and high fuel costs. These economic losses have resulted in effort reductions through the exodus of vessels from the fishery, and reductions are expected to continue through approximately 2012. Based on the likelihood that at some point in time the number of vessels in the offshore shrimp fleet will decline to a point where the fishery again becomes profitable for the remaining participants, there is a need to prevent new effort from entering the fishery and thus negating or at least lessening profitability when that time comes. Consequently, the Council is considering the establishment of a moratorium on the issuance of new federal shrimp vessel permits. An

integral part of a fishery management via a moratorium is the allowance for transferability of permits. This aspect of a moratorium allows managers to track continued participation, and it allows permittees the flexibility to enter or exit the fishery as they choose.

If the reductions in the offshore shrimp fleet that have been occurring since approximately 2001 do not continue and the fleet is determined to be larger than that needed to produce OY, further reductions in the fleet may be need through regulations. By requiring that all vessels report landings during a permit moratorium, the Council would have a universe to stratify vessels' catches into different classes or categories. This would provide a basis for capping actual fishing effort or reducing it in the future, if effort reduction is determined to be needed.

4.0 MANAGEMENT ALTERNATIVES

ROYAL RED SHRIMP

Action 1: Consideration of requiring a royal red shrimp vessel permit or an endorsement to the commercial shrimp vessel permit for vessels harvesting royal red shrimp in the Gulf EEZ

Alternative 1.A: No Action - do not require vessels harvesting royal red shrimp to have a separate commercial royal red shrimp vessel permit or a royal red shrimp endorsement to the commercial shrimp vessel permit to harvest royal red shrimp from the Gulf EEZ

Alternative 1.B: Require a separate commercial royal red shrimp vessel permit to harvest royal red shrimp from the Gulf EEZ

Preferred Alternative 1.C: Require a royal red shrimp endorsement to the commercial shrimp vessel permit to harvest royal red shrimp from the Gulf EEZ

Discussion and Rationale: The royal red shrimp fishery in the Gulf is conducted in deep waters between approximately 100 and 300 fathoms. Partly because of these depths and the distance from shore, only a small number of boats have historically participated in the fishery. In recent years, the number of participants (mainly from Alabama) has been so small that only total landings data and annual CPUE can be reported due to confidentiality of the data. Also, in the past some vessels that normally fish for penaeid shrimp also have participated in the royal red shrimp fishery, and in the early to mid 1990s, catches were very near the annual quota and lower end of the current MSY estimated range, i.e., 392,000 pounds.

Information on this fishery is lacking particularly in regard to catch, effort, operating costs, and the estimate of MSY. The recently enacted federal shrimp vessel permit includes royal red shrimp vessels; however, data manipulations and additional queries will be required to determine vessels specifically targeting royal red shrimp in order to improve the current knowledge base for this fishery under Alternative 1.A. Requiring a separate permit or endorsement to the federal shrimp vessel permit to harvest royal red shrimp, as with Alternatives 1.B or Preferred Alternative 1.C, would provide a readily available database from which to obtain additional information about this

fishery, including its participants, markets, and other socioeconomic factors. If a moratorium is approved as with Action 10, Preferred Alternative 1.C would limit the future participation in the royal red shrimp fishery to vessels and individuals that qualify for a commercial shrimp vessel permit under the moratorium. Under Alternative 1.B the requirement of a commercial shrimp vessel permit would be replaced by a royal red shrimp vessel permit when harvesting only royal red shrimp, and there would be no limitation on the number of such permits that could be issued.

Biological Impacts: There would be no biological impacts from requiring or not requiring an additional permit or endorsement to harvest royal red shrimp from the Gulf EEZ. To the extent that the requirement of a separate royal red shrimp permit or endorsement provides better and/or more readily accessible data on royal red shrimp catch and catch rates, a more accurate determination of the status of the stock may be accomplished. However, the requirement of such a permit or the status quo alternative would not of itself produce any positive or negative biological impacts.

Socioeconomic Impacts: The requirement of an additional permit or an endorsement to the existing shrimp vessel permit could produce some adverse economic impacts if: (1) there is a separate permit application; and (2) there are additional costs for the additional permit or endorsement. If the separate royal red shrimp permit can be obtained at the same time and with the same application process as is in place for the shrimp vessel permit, which is the current expectation, there would be little additional burden on vessel owners or operators. The same would be true for a separate endorsement. Given that all of the current fishery participants possess federal shrimp permits, the additional cost would be $20 per applicant. This cost per applicant would be the same regardless of whether the requirement is for an additional permit or endorsement to the current shrimp permit. The only other costs would be in the additional time required to complete the application, which is minimal since it would only require checking off an additional box on the form.

The additional cost of $20 per application form could be seen as unduly burdensome since all of the participants already pay $50 for the Gulf shrimp permit. Some fishermen may also participate in the South Atlantic rock shrimp or penaeid shrimp fisheries and thus, given the impending permit requirement in the latter, they would have to pay for all of these permits. Given that these vessels are all large and thus likely migratory, this situation is somewhat likely. Some fishermen resent having to pay for permits at all, and that resentment is greater under the current economic climate, and possibly even greater yet for these particular fishermen given the additional gear expenses they must incur to participate in this fishery.

Based on their experience, the Southeast Regional Office's (SERO) Permits Office has advised that, when considering a separate permit as opposed to an endorsement, a separate permit requirement is less confusing to most permit applicants since many are unfamiliar with the term "endorsement" and its exact meaning (R. Sadler, personal communication). Thus, the "aggravation" burden to both the applicants and NMFS would be less with the additional permit requirement as opposed to the endorsement. If the endorsement alternative is selected and fishermen are confused by this term and its meaning, that would heighten their frustration with the permit application process.

Since 14 vessels are known to be engaging in the fishery at this time, the resulting out of pocket cost would be $280. More vessel owners could apply for the permit or endorsement than those who currently participate, which would increase the total cost for the industry as a whole. It is not possible to predict with any certainty how many "speculators" might apply for the permit. Consequently, though Alternative 1.A would impose no costs, the adverse economic impacts from either Alternative 1.B or Preferred Alternative 1.C would be small and approximately the same. These costs would be imposed on a small number of vessel owners. However, in the current economic climate, even relatively small increases in costs could be considered an unwelcome burden from the perspective of fishery participants.

With respect to benefits, they would appear to be minimal as well, though dependent on the Council's choices under Action 8. Specifically, since the current fishery participants all possess federal shrimp vessel permits, information collected on that form is already in hand. Further, these vessels' activities can already be examined from existing data sources. The lone exception to this statement is with respect to effort data. However, should the Council select alternatives under Action 8 that would appreciably increase and improve effort data for the EEZ fishery, these vessels would be covered under such programs. That conclusion would be assured if the Council selects alternatives that apply to all permitted vessels as opposed to only a sample of vessels. But, even if the Council was to select alternatives where only a sample of the permitted fleet was required to provide effort data, the royal red shrimp fishery could be treated as a stratum within the sampling design if such information is deemed as being important. The same would be true for any economic and social data collection programs. If there is little information to be gained from an additional permit or endorsement requirement at this time, then the perceived social costs would be greater still since fishermen would feel that the burden was unnecessary, no matter how small in terms of time and out of pocket expense. Therefore, it is difficult to conclude that there are any benefits from an additional permit or endorsement requirement for royal red shrimp fishery participants with respect to additional or improved information.

However, in the future, if the quota of 392,000 pounds was increased, economic conditions in the fishery improved and/or the costs of participating in the royal red shrimp fishery were to decrease, and vessels could potentially specialize solely on royal red shrimp landings without any reliance on penaeid shrimp landings from the EEZ, then the benefits from such an additional permit would be higher since the need for information specific to their activities would be greater. On the other hand, in discussions with some of the fishery participants (Travis 2004), there would be some support for a separate permit requirement if there was evidence that the stock was in trouble and/or participation and effort increased in a short period of time. That is, current participants would want to protect the resource and the economic health of the fishery if it were necessary.

Furthermore, there is another important link between the alternatives being considered under this action and Action 10. Specifically, if the Council decides to impose a moratorium under Action 10, then the selection of Alternative 1.B or Preferred Alternative 1.C would limit participation in the royal red shrimp fishery to vessels that qualify for moratorium permits. Conversely, the selection of Alternative 1.B would allow any vessel to obtain a royal red shrimp permit. Given the economic status of the royal red shrimp fishery, which likely mirrors the adverse economic

conditions of the Gulf shrimp fishery as a whole, allowing additional vessels from other fisheries and regions to enter the fishery would cause the catch and revenues from the fishery to be shared among a larger number of participants which, given the existence of the 392,000 pound hard quota in the fishery, would potentially decrease the share to each existing participant. Such an outcome would worsen economic conditions in the fishery and would thus be inconsistent with the Council's desire to stabilize and improve the economic performance of vessels in all components of the Gulf shrimp fishery. Thus, it is highly likely that Preferred Alternative 1.C will lead to positive net benefits in both the short-run and the long-run.

Action 2: MSY Alternatives for Royal Red Shrimp

Preferred Alternative 2.A: No action - MSY for royal red shrimp is estimated at a range between 392,000 and 650,000 pounds of tails, annually

Alternative 2.B: MSY for royal red shrimp is 650,000 pounds of tails, annually.

Alternative 2.C: MSY for royal red shrimp is 392,000 pounds of tails, annually.

Discussion and Rationale: GMFMC (1981) estimated MSY at 392,000 pounds annually based on a Schaefer surplus production model. Condrey (1995) re-examined these modeling decisions and concluded that if a generalized surplus production model (GSPM), which he felt was more appropriate, had been used, the estimated value of MSY for royal red shrimp would be about 650,000 pounds, as with Alternative 2.B. He concluded, however, that based on the current data and statistical reasons, there was no defensible basis to select one model over the other. Consequently, the best available scientific information indicates that MSY for royal red shrimp in the Gulf falls within the range of 392,000 and 650,000 pounds as indicated in Preferred Alternative 2.A (No action).

The fishery for royal red shrimp in the Gulf of Mexico does not include the full geographic range of the stock. Consequently, it is likely that the current lower estimate of the current range of MSY is much lower than what could be harvested if the stock was fully exploited. Additionally, highly variable fishing effort from year to year has added to the uncertainty about the MSY of the royal red shrimp stock in the Gulf. Because effort in recent years appears to be well below the effort that would produce MSY if the stock were fished throughout its geographic range, the lower estimate of MSY (392,000 pounds) (Alternative 2.C) is probably not realistic. Likewise the highest recorded landings of 336,810 pounds in 1994 provide little, if any, information on which to evaluate whether a MSY estimate of 650,000 pounds, as with Alternative 2.B, would be any more accurate. Consequently, the best conclusion for an estimate is to use the calculated range that was approved through the Generic Sustainable Fisheries Act Amendment in 1999 and further recommended by the
SSAP (2002), i.e., Preferred Alternative 2.A.

Biological Impacts: Based on the historical royal red shrimp landings (Table 1), none of the MSY alternatives would produce biological impacts that would jeopardize the capacity of the stock to produce MSY on a continuing basis as required by the M-SFCMA. The lowest estimate of

392,000 pounds (Alternative 2.C) has never been reached, and the number of participants has remained at between 5 and 15 for a number of years. If the fishery were to expand, there is a chance that this lower estimate of MSY could be exceeded. Additional analysis by Condrey (1995) also indicated that the MSY estimate of 650,000 pounds (Alternative 2.B) is equally defensible, biologically. Based on the paucity of available information upon which to estimate MSY as discussed in GMFMC (1995) and the reanalysis by Condrey (1995), the SSAP (2002) believed that Preferred Alternative 2.A was the most appropriate definition. Also, by having a range for MSY, catch levels could be allowed to exceed the lower MSY estimate and provide more defensible data upon which future estimates of MSY could be more accurately evaluated.

On the other hand, since the 392,000-pound estimate was established as a hard quota, the NMFS would be obligated to closed the fishery if this value was met in a given year. Since NMFS does not currently quota-monitor the royal red shrimp fishery, this quota could be exceeded in one year, and if so, NMFS would likely take action to institute quota monitoring the following year. Neither actions are likely to occur since the fishery is very small with limited participation, and the 392,000-pound quota has never been taken.

Socioeconomic Impacts: The choice of the lowest or highest estimate of MSY, as is the case with Alternatives 2.C or Alternative 2.B, respectively, would only impose economic costs if the current fishery were to expand. As noted in Table 1, landings have never exceeded the lower alternative for MSY. However, if the fishery were to expand either from additional effort by vessels that are in the fishery or from new entrants, adverse social and economic impacts would ensue. First, if Alternative 2.C is the proposed alternative, and landings were to exceed the 392,000 pound quota, the Council or NMFS could take action to limit or reduce landings. At the least, they would be required to shut down the fishery once the quota was exceeded. If experience in other fisheries can be used as an indicator, once vessel participation and effort reaches the point where the quota is likely to be reached before the season's end, derby fishing conditions are likely to occur, which are known to adversely impact all fishery participants via market gluts and the resulting price decreases. Further, if the expansion was due to the establishment of new or expanded markets, such action would negatively impact the production, buying, distribution, and consumer sectors. Under Preferred Alternative 2.A or particularly Alternative 2.B, negative social and economic impacts are potentially less because they may allow harvests levels nearly two times the highest recorded catch in a given season. Additionally, there would likely be positive social and economic impacts if the fishery were to expand through the development of new or expanded markets and the generation of new or increased income for producers and sellers while providing additional product to consumers. However, this result is completely dependent on whether the Council or NMFS increases the quota to match the change in MSY. That is, these economic benefits could only be created if, in a separate action either now or in the future, the Council or NMFS was to increase the quota above its current 392,000 pound level. Such an action is not presently considered within this amendment, and thus the hypothesized social and economic benefits would only potentially occur in the future. In any case, for reasons previously cited (i.e. costs of entry, limited markets, current adverse economic climate, etc.), it is unlikely that this fishery will expand in the near future, which likely renders both the discussed costs and benefits moot.

In general, MSY specifications do not directly affect resource use. Therefore, regardless of which alternatives are selected, they would have no direct effects on existing fisheries and communities. Direct effects associated with resource use would only accrue as a result of subsequent management action in response to an evaluation of the fishery with regard to these benchmarks. With no direct change in the use of the resource by individuals or communities, there would be no behavioral changes by these individuals or communities and, therefore, no indirect affects attributed to such change in general. These definitions are statutory requirements of an FMP, and their establishment would provide public satisfaction by recognizing that the Council is effectively managing the resource.

Action 3: OY Alternatives for Royal Red Shrimp

Alternative 3.A: No action - OY for royal red shrimp is equal to MSY at a range of 392,000 to 650,000 pounds of tails, annually.

Preferred Alternative 3.B: OY for royal red shrimp is equal to MSY

Alternative 3.C: OY for royal red shrimp is equal to 75% of MSY

Alternative 3.D: OY for royal red shrimp is equal to 90% of MSY

Discussion and Rationale: There would not appear to be any practical difference between setting OY equal to MSY (Alternative 3.A or Preferred Alternative 3.B) and setting OY at 90% of MSY (Alternative 3.D) because the highest annual historical catch in 1994 was only approximately 86% of the lower estimate of MSY at 392,000 pounds. Since 1994, the catch has only exceeded the Alternative 3.C level twice, in 2001 and 2002 at approximately 79% of the lower MSY estimate of 392,000 pounds (Table 1). Alternative 3.D would establish an OY at 10% below the MSY alternative; however, as with Alternative 3.C, it would have no significance unless the fishery expanded. Furthermore, an expansion of the fishery to a level of 90% of the upper estimate of MSY (585,000 pounds) is highly unlikely for reasons previously discussed and as discussed in the Biological Impacts section below. Alternative 3.A (No action) would keep OY equal to MSY as a range and was the recommended alternative by the SSAP (2002) (see discussion below). Furthermore, there is no difference between Preferred Alternative 3.B and Alternative 3.A, unless the preferred alternative is set at a point estimate rather than a range. Because past annual harvest levels have always been below the lower end of this range, it is unlikely that catch would ever approach the upper boundary of this range, and certainly not in the foreseeable future because of the hard quota of 392,000 pounds. Consequently, there is no practical difference from the choice of any of the OY alternatives unless the fishery expands.

Biological Impacts: As with MSY, there would be no biological impacts, positive or negative, from setting a definition of OY. Furthermore, there would be no biological impacts from either of the choices for OY equal to MSY or OY set at 75% or 90% of MSY because as stated above there were only two year in which the most conservative estimate (Alternative 3.C) was exceeded at the lowest estimate of MSY (392,000 pounds), and it was exceeded by only four percentage points. The SSAP (2002) noted that royal red shrimp are not currently being harvested at a rate that would

achieve MSY. Furthermore, the areas where fishing is suspected to be occurring probably do no include the entire range of royal red shrimp in the Gulf; consequently, a greater harvest would be anticipated if the stock was being fished throughout its range. Finally, there is limited participation in this fishery probably due to the costs associated with fishing at depths of 100 to 300 fathoms. Consequently, the SSAP (2002) recommended that OY be set equal to MSY as a range between 392,000 and 650,000 pounds; however, under this range their would be no practical difference from setting OY equal to, or at 75% (Alternative 3.C) or 90% (Alternative 3.D) of MSY because such yields are not likely to be achieved.

Socioeconomic Impacts: As with the MSY alternatives discussed above, the choice of the most conservative alternative (Alternative 3.C with a 392,000-pound OY) or the least conservative alternatives (Alternative 3.A or Preferred Alternative 3.B) would only cause adverse social and economic impacts if the current fishery were to expand in terms of vessel participation or level of effort. Given the current economic climate within the Gulf shrimp fishery and the additional costs and risks associated with participating in the royal red shrimp fishery, such an expansion is unlikely which, at least in the short-term, renders moot the discussion of social and economic costs and benefits from this action.

However, certain alternatives may cause indirect social impacts on the fishermen and their communities should it be determined in the future that lower allowable catch levels are required to meet more conservative definitions. In other words, if the selection of a particular specification increases the probability of restrictive management measures being implemented in the future, this could be considered an adverse, indirect social impact as it heightens fishermen's anxieties regarding an already uncertain future. This is potentially the case with Alternatives 3.C and Alternative 3.D. It should be noted that such SFA parameters – their definition and methods for determining criteria – are concepts not well-understood by the public at large. As such, the simple discussion of such scientific parameters has the effect of confusing some sectors of both the fishing and non-fishing public. This confusion is often linked to further dissatisfaction by the public of fishery management and managers, having a negative impact on the amount of confidence the public has in government officials. This situation of confusion and dissatisfaction is likely even greater for participants in the Gulf shrimp penaeid fishery. Given that penaeid shrimp are an annual crop, and their availability is predominantly determined by environmental factors as opposed to fishing mortality, many industry participants have expressed the opinion that the concepts of overfishing and overfished are not applicable to this fishery. These fishermen have expressed frustration over having to meet a legal requirement that seems more designed to address concerns with longer-lived species. Again, their concern is heightened due to fears that, somewhere down the road, the establishment of these parameters could potentially lead to management changes that would have adverse impacts on them. These concerns regarding indirect social impacts are applicable to Actions 4, 5, 6 and 7 as well, but are not repeated for the purpose of brevity.

Action 4: Overfishing Definition for Royal Red Shrimp

Alternative 4.A: No action - Overfishing royal red shrimp is defined as fishing in excess of the lower estimate of OY (392,000 pounds)

Alternative 4.B: The overfishing threshold for royal red shrimp is defined as a fishing mortality rate (F) that results in an annual catch exceeding MSY

Preferred Alternative 4.C: The overfishing threshold for royal red shrimp is defined as a fishing mortality rate (F) that results in an annual catch exceeding MSY for 2 consecutive years

Alternative 4.D: The overfishing threshold for royal red shrimp from the Gulf of Mexico is defined as a fishing mortality rate (F) that exceeds F_{MSY}

Discussion and Rationale: Under the current management regime for royal red shrimp, OY is equal to MSY at a range of 392,000 to 650,000 pounds, and overfishing occurs when the lower level of this range (392,000 pounds) is exceeded, as stated in Alternative 4.A. Also, the 392,000-pound level has been established as a quota and when (or if) it is met, the fishery is closed. Alternative 4.B would retain the current practice of considering the stock as undergoing overfishing if MSY (whether a point estimate or a range) is exceeded in any year; whereas Preferred Alternative 4.C would allow MSY to be exceeded for 2 years before there would be declaration of overfishing. Both of these alternatives, as well as Alternative 4.A, assume that the catch associated with the MSY estimate is equivalent to fishing at MSY (F_{MSY}). Thus catches that exceed these MSY estimates would result in F values in excess of F_{MSY}. This concept is basically theoretical, however, because F to F_{MSY} has not been actually calculated as would be the case under Alternative 4.D. GMFMC (1995) explained the problems with the definition of MSY at 392,000 pounds and the need to obtain a more precise estimate of MSY by allowing a larger harvest if there is sufficient interest. Furthermore, as noted in the previous MSY discussions, the royal red shrimp stock is currently not being fished throughout its range. Consequently, there is a strong likelihood that the lower level of estimated MSY is overly conservative. A determination of whether F_{MSY} is being exceeded at catches above the lower or upper MSY estimates needs to be made prior to concluding that overfishing is occurring. Preferred Alternative 4.C would allow time for this determination without jeopardizing the stock. Alternative 4.D offers an option for defining overfishing as a F that exceeds F_{MSY}. Although this is a viable alternative, as stated above, neither F nor F_{MSY} has been estimated for the royal red shrimp stock in the Gulf. Furthermore, since the estimates of MSY have been derived from surplus production models, estimates of F_{MSY} are not likely to be any more precise than the estimated range of MSY (392,000 to 650,000 pounds).

Biological Impacts: As previously noted for MSY and OY definitions, the setting of a definition of the overfishing threshold would not result in either positive or negative biological impacts; however, management measures that would be required to keep catches below MSY or OY levels could have biological implications, but only if the fishery expands beyond its current catch levels. Alternative 4.A would offer the greatest potential for a declaration of overfishing and resultant actions to reduce harvest from expanding catches because the highest annual catch has been approximately 86% of this 392,000-pound MSY value. Alternative 4.B would offer the same potential for overfishing as Alternative 4.D, if MSY is set at 392,000 pounds. Alternative 4.A would also be the same in terms of biological impacts at the lower MSY estimate; however, it has

previously been rejected by NMFS because it is not F-based. Alternative 4.B would not be biologically different from Alternative 4.D regardless of the MSY value chosen. Preferred Alternative 4.C is the least conservative alternative but probably the most scientifically defensible based on the current level of participation and the known biological range of the royal red shrimp stock. Based on the discussions presented by SSAP (2002), the royal red shrimp fishery is not currently being prosecuted to its fullest extent, and there is a strong likelihood that substantial expansion could occur without detrimental effects on the royal red shrimp stock. Consequently, the SSAP (2002) recommended Preferred Alternative 4.C. Alternatives 4.B and 4.D are not practically different, but as stated above neither F nor F_{MSY} have been actually calculated. Alternative 4.B and Preferred Alternative 4.C would assume F values based on catches. In other words, if catch equals or exceeds MSY, then F for that year is assumed to be at or above F_{MSY}. In summary, none of the alternatives would result in a declaration of overfishing based on current catch levels and their associated F values, but Preferred Alternative 4.C would allow catch to exceed MSY in a given year and potentially within the range of MSY and provide better data upon which to estimate MSY in the future. On the other hand, this would only occur if the Council subsequently eliminates or alters the 392,000 pound hard quota.

Socioeconomic Impacts: As with biological impacts, establishing a definition of the overfishing threshold based on any of the alternatives would not immediately result in any economic impacts because overfishing would not be declared at this time. Consequently, there would not be a need to reduce harvests that would impose economic costs. If the fishery were to expand, capping landings and their associated F values at the lowest MSY value (392,000 pounds) as could occur with Alternatives 4.A or 4.B, impacts could occur in two ways. First, if the expansion in landings results from increased effort by existing participants only, their earnings potential would be capped. However, because of the low number of participants in the royal red shrimp fishery, this cap would likely result in lesser impacts than if the expansion occurred as a result of new entrants. In this case, the lowest level of potential landings (392,000 pounds) would be shared by more participants resulting in more severe economic impacts, particularly if derby fishing conditions were to occur due to the quota. With a higher MSY, potentially under Alternatives 4.B or 4.D, the impacts under either scenario would be potentially lessened, depending on future Council actions regarding the quota. If the declaration of overfishing did not occur until the higher F_{MSY} (Preferred Alternative 4.C) is exceeded for two consecutive years, the likelihood of an overfishing declaration and subsequent management measures to reduce F would be reduced further. However, at the present time, there would be no adverse economic impacts from any of the alternatives.

Action 5: Overfished Definition for Royal Red Shrimp

Alternative 5.A: No Action - Do not establish an overfished definition for royal red shrimp in the Gulf of Mexico

Alternative 5.B: The royal red shrimp stock would be considered as overfished when its catch in any year is below 50% of MSY

Alternative 5.C: The royal red shrimp stock would be considered as overfished when its catch is below 50% of MSY for 2 consecutive years

Preferred Alternative 5.D: The royal red shrimp stock would be considered as overfished when its spawning stock biomass (B) is less than 50% of B_{MSY}

Note: Under Alternatives 5.B and 5.C, the declaration of the stock being overfished would not be made until the Regional Administrator in consultation with the Council determines that the reduction in catch is due to fishing mortality that has resulted in the stock becoming overfished.

Discussion and Rationale: The CSAP (1998) indicated that there were insufficient data to specify an overfished threshold because there is no reliable information on the stock size. However, the SSAP (2002) noted that using the default control rule recommendations of NMFS, a stock would be considered as overfished when its spawning stock biomass (B) is reduced to some level below $B_{MSY.}$ Because B is unknown and the M-SFCMA allowed a stock to be fished to as low as 50% of its $B_{MSY,}$ the SSAP (2002) concluded that B was probably sufficiently large that the fishery, if fully developed, could support higher catches than the currently estimated MSY values and recommended that the royal red shrimp stock in turn should not be considered as overfished unless catch in a given year exceeded MSY by 100% to 200%. Furthermore, the SSAP (2002) believed that either of these catch levels could be maintained for 2 or 3 consecutive years before the stock would potentially be considered overfished. Alternatives 5.B and 5.C use the assumption that fishing mortality has resulted in yields falling to below estimated MSY levels and a corresponding reduction in B to below B_{MSY}. Other factors could be involved such as effort reduction due to high fishing costs, low prices, low demand, or other factors. A determination as to whether fishing effort has resulted in declining catches to a point where B is sufficiently below B_{MSY} would need to be made prior to considering the stock as overfished. As with Alternative 4.D regarding F/F_{MSY}, Preferred Alternative 5.D is a viable alternative; however, B and B_{MSY} have not been estimated. This alternative would be consistent with the lowest allowable spawning stock size under the National Standard Guidelines for National Standard 1 if it could be estimated. Alternative 5.A is not a viable alternative under the M-SFCMA National Standard Guidelines for National Standard 1 that require a definition of the overfished condition of all managed stocks. It is included here for purposes related to the EA as required by the National Environmental Policy Act (NEPA).

Biological Impacts: As previously noted for MSY, OY, and overfishing definitions, the setting of a definition of the overfished threshold would not result in either positive or negative biological impacts; however, management measures that would be required to rebuild the royal red shrimp stock to MSY or OY levels, should it be declared as overfished, could have biological implications, but, as previously discussed, only if the fishery expands beyond its current catch and effort levels. Even with such an expansion, the invocation of monitoring the quota of 392,000 pounds would preclude catches from exceeding this level thereby ending any overfishing prior to the overfished threshold being met. Additionally, if catch does decline, it would have to be determined if the decline was due to mortality or other factors. As previously discussed vessel participation in only the last 5 years has varied from 5 to 15 vessels, and Table 1 shows that catch has varied from approximately 176,000 pounds to nearly 312,000 pounds over the same period.

Consequently, participation and effort appear to be more important factors influencing F, as opposed to available B.

Preferred Alternative 5.D is probably the most appropriate overfished definition; however neither B or B_{MSY} have been calculated, and it is doubtful that they could be calculated to an appropriate level of certainty. Alternative 5.C would be the most risk-prone definition; however, as previously discussed the stock is not being harvested at levels even approaching the lower end of the MSY range within the limited geographical area where fishing occurs. Furthermore, SSAP (2002) felt that the harvest could be increased by 200% for 2 to 3 years without damage to the resource. Alternative 5.B would not be biologically different from Preferred Alternative 5.D; however, catch can be measured; whereas B_{MSY} cannot. Alternative 5.A would not be approvable under the M-SFCMA and Guidelines for National Standard 1and is included for NEPA evaluation only.

Socioeconomic Impacts: As with biological impacts, establishing a definition of the overfished condition based on any of the alternatives would not immediately result in any economic impacts. Consequently, there would not be a need to reduce harvests that would result in adverse economic impacts. If the fishery were to expand and F was not checked to the point that the stock became overfished, economic impacts would occur. Alternatives 5.B and 5.C would allow biomass to be reduced to 50% of B_{MSY} based on catch equaling or exceeding the chosen MSY value, which is the lowest level allowed by the M-SFCMA. Alternative 5.C would allow this level of reduction to occur for a 2- year period, and thus it would be the most risk-prone alternative. However, both alternatives assume that the chosen level of MSY is correct, and that F is the factor that has driven the stock to such levels, which may not be the case. Preferred Alternative 5.D would also be risk-prone, if B and B_{MSY} could be accurately calculated, which is doubtful at the present time. Alternative 5.A would not be approvable under the M-SFCMA and Guidelines for National Standard 1and is included for NEPA evaluation only. Potential economic impacts from the stock being declared overfished would probably follow the same two paths discussed above for a declaration of overfishing. The only difference would be that a rebuilding plan would have to be developed, and reduced harvest levels might be required for a slightly longer period of time, thereby prolonging such negative economic impacts. Since royal red shrimp are not considered a long-lived species, with a maximum age at about 5 years (Anderson and Lindner 1971), impacts from rebuilding would likely not be prolonged. However, since there are only approximately 14 active vessels in the fishery, and several are highly dependent on royal red shrimp landings, any significant reduction in allowable catch could result in an economic collapse of the fishery. At the present time, however, there would be no adverse economic impacts from any of the alternatives.

PENAEID SHRIMP SPECIES

Action 6: MSY alternatives for Brown, White, and Pink Shrimp

Alternative 6.A: No action - MSY for the penaeid shrimp stocks falls within the range of values defined by the Schaefer surplus production model:

- **MSY for the brown shrimp stock is between 100 and 132 MP of tails**
- **MSY for the white shrimp stock is between 50 and 64 MP of tails**
- **MSY for the pink shrimp stock is between 15 and 20 MP of tails**

Preferred Alternative 6.B: MSY for the penaeid shrimp stocks falls 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:

- **MSY for the brown shrimp stock is between 67 and 104 MP of tails**
- **MSY for the white shrimp stock is between 35 and 71 MP of tails**
- **MSY for the pink shrimp stock is between 6 and 19 MP of tails**

Alternative 6.C: MSY for brown, white, and pink shrimp in the Gulf of Mexico is defined as, "all the shrimp that can be taken during open seasons in permissible areas in a given fishing year with existing gear and technology without resulting in recruitment overfishing as herein defined."

Note: The Council has determined that, because of the annual nature of these resources, a numerical value for MSY for these species cannot be calculated for any given year until the environmental factors can be determined and evaluated. Additionally, these conditions may vary geographically throughout the Gulf. However, under optimum environmental conditions and maximum effort the maximum probable catch for brown, white, and pink shrimp is estimated to be 216 million pounds of tails.

Discussion and Rationale: MSY is considered to be the largest long-term average catch that can be taken continuously from a stock under prevailing ecological and environmental conditions. Current data gaps preclude the estimation of B_{MSY}. The National Standard Guidelines (50 CFR 600.310[c][2][i]) identify alternatives for establishing MSY to include removal of a constant catch each year that allows the stock size to remain above an identified lower level, or to allow a constant level of parent stock escapement each year. For penaeid (brown, white, and pink) shrimp stocks, it is appropriate to establish an MSY control rule that would relate 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. Based on that assumption, the Council previously established its MSST and MFMT thresholds in regard to the relative abundance (health) of the parent stock that would produce next year's recruitment available for harvest (see Section 1.0 for these designations). To that end, the alternatives for MSY, based on catch, reflect the yield that will maintain parent stock levels above MSST.

The definition of MSY was a contentious issue during the original development of the shrimp FMP because the annual harvest levels upon which any point estimate of MSY was based varied by up to 30%, due to environmental factors affecting survival in the nursery grounds. Alternative 6.C is the current definition of OY for the penaeid shrimp fishery that was approved with the original FMP (GMFMC 1981). As an OY definition, this alternative could allow harvest in a given year to potentially exceed a point estimate of MSY. Alternative 6.A was adopted by

GMFMC (1981) to potentially prevent this occurrence because this range of MSY was based on the maximum probable catch under optimum environmental conditions and maximum effort.

The Schaefer surplus production model, and other surplus production models utilize trends in catch and fishing effort over a series of years. For the three penaeid species, surplus production models indicate only a long- term average yield, and not an allowable maximum. The catch in any given year can only be estimated using environmental factors and expected effort for that particular year. Consequently, these models were designed for, and are usually applied to, species with multiple year classes, (i.e., individual animals that live longer than one year). They do not consider fluctuations in recruitment controlled by the environment, but assume that environmental effects are constant. Because penaeid shrimp meet neither of these criteria, these models are poor indicators of MSY. Estimates of MSY produced should be considered as long-term averages that are greatly affected by environmental conditions. They should not be considered a maximum allowable catch for a given year.

Although the Council recognized the inherent problems with the Schaefer version of the surplus production model, it was chosen by GMFMC (1981) to estimate MSY in all three species because: (1) sufficient data were available; (2) it fit the data as well as other models which gave similar estimates of MSY; and (3) was mathematically easier to use. The estimate was calculated using only reported catch and effort from the commercial fishery. Estimates of the recreational catch, bait catch, and discarded undersized shrimp were added, for a total MSY of 165 million pounds of tails annually for the three species. A reasonable estimate of the maximum probable catch was developed for all three species by applying the percentage by which the maximum probable catch of brown shrimp exceeded the Schaefer MSY estimate to all species (i.e, by 37.6%). Estimates of bait catch, recreational catch, and discards are then added to give a total maximum probable catch of 216 MP of tails.

The GMFMC (1981), CSAP (1998), and SSAP (2002) cautioned against the use of point estimates of MSY due to the uncertainty with these estimates and the potential fluctuations in catch due to the environmental sensitivity of these stocks. Shrimp harvests can exceed a long-term average MSY for perhaps several years without damage to stock productivity. Conversely, harvests below MSY might occur during periods of low recruitment when the fishery does not target a species to the extent possible during a given year. In such a case, low landings might simply reflect a lack of effort instead of a reduced stock size. Similarly, a stock might undergo a moderate recruitment year, but economic or social factors might inhibit fishery effort on that stock, and annual landings would decline. Conversely, because of good prices or exceptionally good recruitment, landings might be exceptionally high during a given year, or longer-term period, giving a false impression that MFMT or MSY was exceeded.

Because MSY should reflect the largest long_term average catch that can be taken continuously from a stock under prevailing ecological and environmental conditions, Preferred Alternative 6.B was recommended by the SSAP (2002) because these ranges of catch for each species represent the lowest and highest annual catches from which there has been sufficient survival of adults to produce an adequate number of recruits for the following year. Furthermore, the CSAP (1998) noted that maintaining sufficient spawning stock is much more appropriate for shrimp

management than comparing catches to uncertain MSY values; however, utilizing a range of catch that represents the lowest and highest levels is the most appropriate approach given the fact that such definitions are required.

Biological Impacts: Based on the historical penaeid shrimp landings (Table 2, 3, and 4), none of the Alternatives 6.A, Preferred Alternative 6.B, or Alternative 6.C represents a MSY level that would produce biological impacts that would jeopardize the capacity of the stocks to produce MSY on a continuing basis as required by the M-SFCMA. The number of surviving adults needed to produce the necessary recruits in a given year and the subsequent environmental conditions in the following year are the major factors that contribute to the available catch. The language of Alternative 6.C would likely invoke biological concern for most species because it simply allows unlimited harvest. However, since the shrimp fishery in the Gulf EEZ is unregulated with regard to the amount of gear that can be used, the amount of time that can be fished, or the amount of shrimp that can be caught; this alternative is tantamount to the current status quo OY definition in terms of management. The only regulations that reduce shrimp catch are the requirements of BRDs and TEDs that have an associated shrimp loss. Preferred Alternative 6.B was recommended by the SSAP (2002), over Alternative 6.A, as the most appropriate range of MSY because it represents the highest and lowest historical catches for each penaeid species, compared to projections of what yields might be. One could choose the highest catch as MSY; however, as discussed in the "Introduction", MSY is a rather inappropriate concept for an annual species where catchability is annually determined by the prevailing environmental conditions. Consequently, it would appear that a range for the MSY would be more appropriate.

Socioeconomic Impacts: There would be no economic impacts from any of the MSY alternatives because penaeid shrimp harvests are primarily dictated by external environmental and economic conditions. Environmental conditions control the availability of shrimp. In combination with economic conditions, both affect the level of effort and thus the actual harvest of shrimp. Because there are no management restrictions that directly restrict the amount of shrimp harvested, though catches may be reduced as a result of losses from BRDs and TEDs as well as from an assortment of time and area closures throughout the Gulf, fishermen can generally exert as much effort as they desire in catching the available supply in any given year. Additionally, because the consumption of shrimp far exceeds the available domestic harvest, market price appears to be influenced by imports to a far greater extent than the available domestic supply, though seasonal fluctuations still exist. On the other hand, a larger supply of fresh local shrimp could increase profits to local fishermen and other levels of the industry (e.g. dealers and processors that rely on domestic shrimp).

Action 7: OY alternatives for Brown, White, and Pink Shrimp

> **Alternative 7.A: No action - OY is determined to be: all the shrimp that can be taken during open seasons in permissible areas in a given fishing year with existing gear and technology without resulting in recruitment overfishing. The Council has determined that, because of the annual nature of these resources, a numerical value for OY for these species cannot be calculated for any given year until the environmental factors can be determined and evaluated. Additionally, these conditions may vary geographically**

throughout the Gulf. However, under optimum environmental conditions and maximum effort the maximum probable catch for brown, white, and pink shrimp is estimated to be 216 million pounds of tails.

Preferred Alternative 7.B: OY for the penaeid shrimp stocks equals MSY

Alternative 7.C: OY for the penaeid shrimp stocks equals (0.90) MSY

Alternative 7.D: OY for the penaeid shrimp stocks equals (0.75) MSY

Discussion and Rationale: As stated under Action 6 (MSY alternatives), Alternative 7.A was approved because the Council determined that penaeid shrimp represented annual resources, and there abundance was commensurate with environmental conditions. Therefore, a numerical value for OY could not be calculated for any given year until the environmental factors were determined and evaluated. However, under optimum environmental conditions and maximum effort, the maximum probable catch for brown, white, and pink shrimp was estimated to be 216 million pounds of tails using the Schaefer surplus production model. The Council did not feel that this level could be exceeded by the language of the definition.

The SSAP (2002) recommended Preferred Alternative 7.B for the OY definitions for each of the three penaeid shrimp stocks (brown, white, and pink). The SSAP (2002) recommended these OY levels equal to MSY because there is far more demand for shrimp than can be supplied by the Gulf of Mexico, and there does not appear to be any biological reason to set OY at a level below MSY as would be the case with Alternatives 7.C and 7.D because these are annual stocks whose abundance in a give year is dictated primarily by environmental conditions.

Biological Impacts: There would be no biological impacts from any of the OY alternatives presented above. For Alternative 7.A and Preferred Alternative 7.B, the biological rationale would be the same as previously discussed for the MSY alternatives in Action 6 above because they are identical. Intuitively, there might be biological benefits to shrimp and bycatch species from fishing at an OY level that is less than MSY (Alternatives 7.C and 7.D); however, as discussed penaeid shrimp are an annual crop. MSY would vary annually based on environmental conditions throughout the fishing year, thus it could not be predicted prior to the fishing year.

Additionally, recruitment also varies annually based on environmental conditions as does the number of surviving adults that will contribute to the subsequent recruits in the following year. Consequently, in some years, if not all, yield may be below MSY estimates. This statement is made because the lowest observed level of surviving adults for all 3 of these stocks has shown the ability to produce adequate recruits for the subsequent year's harvest. Therefore, these lowest levels could probably be even lower and still allow adequate spawning potential. In other words, more harvest could have occurred above observed levels without resulting in a reduction in the next years recruits meaning that harvest has been below MSY in most, if not all years, since adult survival has been monitored.

Socioeconomic Impacts: Since they are identical, the economic impacts of the OY alternatives would be the same as for the MSY alternatives in Action 6 presented above.

Action 8: Alternatives to Establish Bycatch Reporting Methodologies and Improve Collection of Shrimping Effort Data in the EEZ

Alternative 8.A: Establish paper logbooks to improve effort data

Preferred Option 1: No action - Do not establish paper logbooks.

Option 2: Improve the shrimping effort data by requiring that all federally permitted shrimp vessels complete an effort logbook and submit it to NMFS on a monthly, bimonthly, or quarterly basis that includes:

a. the size and number of shrimp trawls deployed for each set
b. the time of deployment and the time of retrieval for each set
c. the number of sets per trip
d. the length/duration of each trip
e. the area fished for each set
f. the type of BRD and TED

Vessel permits will not be renewed for vessels that do not provide reports under the schedule established by NMFS

Option 3: Same as Option 2, except that the list of shrimp vessel permit holders would be used to develop a statistically valid sample of shrimp vessels operating in the EEZ to participate in the program.

Alternative 8.B: Establish Electronic Logbooks to Improve Effort Data

Option 1: No action - Do not establish electronic logbooks.

Option 2: Improve the shrimping effort data by requiring that all shrimp vessels operating in the EEZ participate in an electronic logbook program administered by NMFS to adequately determine the amount and location of effort that is occurring in the shrimp fishery of the EEZ. Vessel permits will not be renewed for vessels that do not participate in the electronic logbook program established by NMFS.

Preferred Option 3: Same as Option 2, except that the list of shrimp vessel permit holders would be used to develop a statistically valid sample of shrimp vessels operating in the EEZ to participate in the electronic logbook program. The vessels selected to participate must also provide the NMFS as requested:

a. the size and number of shrimp trawls deployed for each set
b. the type of BRD and TED

Alternative 8.C: Utilize Observers in a standardize bycatch reporting methodology

Option 1: No action - Do not use observers in a standardize bycatch reporting methodology

Option 2: Establish a bycatch reporting methodology by utilizing the existing voluntary observer programs of the NMFS to determine effort and the amount and type of finfish and invertebrate bycatch in the shrimp fishery. The NMFS would then use total effort estimates based on best available scientific information to extrapolate the observer-collected data into overall estimates of total annual finfish and invertebrate bycatch

Preferred Option 3: Establish a bycatch reporting methodology by using the list of shrimp vessel permit holders from which NMFS will develop a random selection procedure for determining vessels that will be required to carry observers in order to collect bycatch and effort information. In selecting vessels that will be required to carry observers, the NMFS will consider the suitability of the vessel for such purpose and insure that vessels included are representative of all statistical subzones. The NMFS will use total effort estimates based on best available scientific information to extrapolate observer-collected data into overall estimates of total annual finfish and invertebrate bycatch. Vessel permits will not be renewed for vessels that do not carry observers in accordance with this process.

Discussion and Rationale: In developing a methodology to assess the amount and type of bycatch for the shrimp fishery of the Gulf of Mexico as required by Section 303 (a) (11) of the M-SFCMA, the Council is confronted with two immediate problems. First, the bycatch is made up of a very large number of species that differ depending on the species of shrimp being harvested, environmental perturbations, and the geographic location of trawling. This problem is compounded by seasonal differences in abundance and the fact that the vast majority of this bycatch is made up of species that have very little or no commercial or recreational value and are discarded. The total amount of bycatch is also large at approximately 600.0 MP, annually (calculated by using shrimp catch at 150.0 MP and a ratio of 1:4, shrimp to bycatch). Consequently, although a rough estimation of the amount of bycatch can be made by sampling bycatch to shrimp catch ratios and multiplying, this method does not address the legal requirement of assessing the "type" of bycatch because being unwanted it is discarded without identification.

The second problem is concerned with estimating effort. There are currently approximately 2,500 permitted vessels that harvest shrimp from the EEZ, and GMFMC (2001) estimated that there were over 13,000 boats that fish in state waters. With such a large number of vessels of differing sizes, gears used, and fishing capabilities compounded by seasonal variabilities in abundance and price and the broad geographic distribution of the fleet, it is practically impossible to estimate the actual amount of fishing effort using current methods and data.

Effort is currently estimated by NMFS' port samplers; however, they typically rely on interview data. Bycatch information is currently available from various past studies and incorporates both fishery-dependent and fishery-independent data. Because of the aforementioned problems, the only practical ways of improving the estimates of the amount and type of bycatch is by having a more precise means of estimating effort than is currently used by NMFS port samplers and

mandatory observer coverage to characterize bycatch. Additional observers or some other means of annually sampling at least a portion of the harvest throughout the shrimping season and geographic distribution of the shrimp fishery to gather data on the amount and type of bycatch is needed. An improved estimate of effort could then be used to extrapolate the sample estimate of bycatch to develop a total estimate of the amount and type of bycatch.

Options 2 or 3 under Alternatives 8.A and 8.B provide means of improving current estimates of effort. These options under Alternative 8.A would place the burden of collecting effort information on the vessel captains via the use of paper logbooks, as is currently the practice for the commercial reef fish and king mackerel fisheries, and the charter boat fishery for reef fish and king mackerel. Option 3 would be less burdensome than Option 2 because only a subset of vessel permit holders would have to complete logbooks at any given time. However, either of these options under Alternative 8.A would require more time and effort than Preferred Option, and they would probably be less accurate than similar options under Alternative 8.B.

The Option 2 under Alternative 8.B (electronic logbooks) would remove most of the burden on captains, with the exception of providing information on the amount, type, and size of gear used. This information could be collected via the alternatives under Action 9, herein or through interview data when the electronic logbooks are installed. Preferred Option 3 under Alternative 8.B would be even less burdensome and less costly in that only a subset of vessel permit holders would be required to participate in an electronic logbook program and provide the necessary information on gear. Gallaway et. al. (2002) utilized an electronic logbook that combined a Global Positioning System (GPS) with a recording of trawling speed to determine when, where, and for how long a vessel was fishing. This device was removable and allowed the data from each trip to be downloaded into a computer for analysis. Such a system could greatly reduce the burden of effort reporting on shrimp fishermen while improving the database on trawling effort. Other types of electronic logbooks have also been used in other fisheries. The major impact for the choice of electronic logbooks would come from who pays for them and their cost. The version used by Gallaway et. al. (2002) cost approximately $500 which would not result in any significant impacts, if the industry were required to purchase them. On the other hand, this amendment assumes that the costs of electronic logbooks would be borne by the NMFS. If all vessels were required to use electronic logbooks, purchased and maintained by NMFS, the cost could be significant. Alternatives to require only a subset of vessels to report through the use of paper logbooks or electronic logbooks (Options 3 under Alternatives 8.A and 8.B) would be less burdensome than if the whole fleet had to meet this requirement, and electronic reporting would probably be preferable to paper reporting via Options 2 or 3 under Alternative 8.A. Options for subset reporting under either Alternative 8.A or 8.B would, however, be less accurate because the sample would have to be expanded to the whole fleet.

Amendment 10 to the Shrimp FMP proposed the use of data from the SEAMAP program to characterize the type of bycatch occurring in the shrimp fishery. SEAMAP is a fishery-independent trawl survey that does not use TEDs or BRDs in shrimp trawls, and its operation is usually during daylight hours as opposed to most commercial operations occurring at night. Consequently, its use as an element of a bycatch reporting methodology was rejected. Option 2 and Preferred Option 3 under Alternative 8.C would contribute to the establishment of a

bycatch reporting methodology utilizing observers aboard commercial shrimp vessels to determine effort and the type and amount of bycatch incurred from such effort. Option 2 under Alternative 8.C would utilize the existing observer program which has a limited sampling program and relies on voluntary participation. Preferred Option 3 under Alternative 8.C (with sufficient funding) would offer a more random and broader sampling of the type and amount of bycatch because it would be mandatory, and any vessel that refused to participate could lose their permit to shrimp in the EEZ.

Under Action 8 a standardized bycatch reporting methodology would be created in several ways. First, Options 2 or 3 under Alternative 8.C could be chosen in concert with Option 1 under either Alternative 8.A and/or 8.B, and bycatch would then be extrapolated by using existing means of estimating effort (or as improved by the requirement of either paper or electronic logbooks). Second, Option 2 or 3 under Alternative 8.C could be coupled with either Option 2 or 3 under Alternative 8.A and/or 8.B, and these improved effort estimates would be used to extrapolate observers' analysis of the amount and type of bycatch. Finally, Option 2 or 3 under either Alternative 8.A and/or 8.B could be adopted along with Option 1 for Alternative 8.C, and the NMFS would use the improved effort data in concert with the best available existing data that characterizes the type of bycatch to create a standardized bycatch reporting methodology.
Biological Impacts: There would be no direct biological impacts from establishing measures to improve effort data through the use of logbooks and/or observers and thus develop a standardized reporting methodology to estimate bycatch in the shrimp fishery of the Gulf of Mexico. The alternatives discussed above would only establish various means of determining the amount and type of bycatch that is occurring in the shrimp fishery on an annual basis. To the extent that any of these alternatives provides a better understanding of the bycatch, it may prove useful in conjunction with future biological and ecological research regarding the relationships of bycatch species, as well as potentially improving stock assessments for managed species that occur as bycatch in the shrimp fishery. It is, however, unlikely that any of these alternatives would provide data with sufficient precision that they would provide better indices than those currently used in stock assessments for the managed finfish stocks. In the long run, however, the data will be useful in any program to develop management strategies using an ecosystem approach.

Socioeconomic Impacts: Prior to discussing the potential economic costs of the various alternatives under this action, some discussion of their potential benefits is necessary. For several years, the issue of how to accurately measure effort in the shrimp fishery has been a subject of debate, not only among the industry, the Council, and NMFS, but also between an assortment of academic researchers. Effort data are currently collected by NMFS' port samplers via opportunistic interviews with vessel captains.

Going back at least to 1993, the Council convened a shrimp effort committee to analyze potential deficiencies in the shrimp effort data and the methods used to collect it (GMFMC 1994). The committee provided a long list of recommendations regarding issues that needed to be addressed and the means to address them, particularly with respect to changes in data collection techniques that would minimize potential bias due to the lack of randomness. Some of those recommendations have been followed, at least to some extent, such as implementation of a permit requirement and a Gulf-wide trip ticket system, while most others have not. While the committee

recognized that implementing a more random effort data collection program would not be easy, their conclusion was that the benefits would outweigh the costs, particularly given the important management issues directly and indirectly involving the fishery at that time; issues that are still discussed today, such as levels of finfish bycatch, turtle interactions, and overcapacity. Further, while trip tickets may be an efficient means to collect landings and sales data, given that they are dealer reporting systems, they may not be a very efficient or accurate means to collect information about fishing activity that occurs at sea. Dealers do not directly observe such activities; fishermen do.

Concerns regarding the randomness of port sampler effort interview data were again expressed in Griffin et al. (1997). This research was primarily concerned with the lack of interview coverage for inshore trips, particularly those taken by state registered boats. Their conclusion was that, while NMFS' estimates of days fished (effort) was fairly accurate for the offshore component of the fishery, its estimate of inshore effort was biased, and thus effort estimates for the fishery as a whole were also biased. In addition to recommending that the interviews of inshore trips be increased, they also set forth an alternative model for estimating effort in the fishery. In their view, their alternative model would be more sensitive to annual changes in effort and thus would be more likely to capture those changes.[1]

Travis (2000) also addressed the issue of potential bias in the effort interview data and questioned certain aspects of the NMFS' method of estimating effort. One recommendation from that paper was to examine the possibility of implementing logbooks to ensure that effort data was in fact representative of the fishery. Most recently, Griffin (2004) re-examined the NMFS' model and the alternative model of Griffin et al. (1997) for estimating effort using data through 2002. His conclusion was that, not only has the bias in the effort data become more serious, but the sources of the bias have expanded as well (i.e. the data are even less representative of the fishery than in the past). Specifically, the data are not representative across vessel size (small vessels are almost completely ignored in the interview data), states (interviews of Texas and Alabama vessels' trips far exceed their proportion of trips in the fishery), area fished (inshore effort interviews are practically non-existent), and gear (though skimmer nets have increased in importance, their coverage in effort interviews has declined). Part of the problem lies not just in the randomness of the effort interviews, but in the sheer lack of number. As a result, Griffin (2004) concluded that neither the NMFS nor the Griffin et al. (1997) methods may be suitable for estimating effort in the fishery. Further, for the first year since the models have been compared, the two methods yielded effort estimates that moved in different directions in the same year (i.e. in 2002, the former showed effort increasing from 2001 while the latter indicated the opposite), which is a serious concern from both a scientific and a management perspective.

Haby et al. (2002) specifically took issue with the spatial accuracy of the effort interview data. That is, in practice, it is common for interviews to lump all effort into one particular statistical area and depth zone even when, in fact, the effort was distributed across multiple statistical areas and depth zones. While this type of bias may not affect estimates of total effort in the fishery, it certainly affects estimates of its spatial distribution. In a fishery that is faced with a multitude of

[1]One potential drawback to their method is that it relies heavily on vessels and boats being completely and accurately identified in the landings data, a problem which is discussed in detail in Section 5.4 of this Amendment.

historical and relatively new time and area closures, such biases could seriously distort estimates of the economic and social impacts of proposed closures, and thereby lead to poor management decisions that unnecessarily burden the industry and/or do not solve the problem they are intended to address. Gallaway et al. (2003a) advanced similar concerns, but with a specific focus on NMFS' estimates of bycatch, particularly that of juvenile red snapper and turtles. This research appears to indicate that, indeed, there are important biases with respect to the spatial nature of NMFS' effort estimates and thus potentially its estimates of bycatch. Their proposed solution was to implement a simple electronic logbook program in the fishery, possibly in combination with paper logbooks.

Bycatch information is currently only available from various past studies and incorporates both fishery-dependent and fishery-independent data. Because of various problems discussed in the RIR, the only practical way of improving the estimates of the amount and type of bycatch is by having a more precise means of estimating effort than is currently used by NMFS port samplers. Some means of randomly sampling a representative portion of the fishing effort throughout the shrimping season and geographic distribution of the shrimp fishery to gather data on the amount and type of bycatch is also needed. The improved estimate of effort could then be used to extrapolate the sample estimate of bycatch to develop a total estimate of the amount and type of bycatch.

As an additional benefit, improved effort information could also be used to generate more accurate estimates of interactions with turtles and estimates of capacity, overcapacity, and excess capacity. Additional certainty regarding these measures should lead to less controversy in the management process and thus to quicker, easier, and more long-lasting, if not permanent, solutions. If that result could be attained, the costs of management would be reduced, and thus the burden on taxpayers as well. If fishery regulations were stable for a longer period of time, that would constitute an important benefit to an industry that is already beset by various sources of instability and the resulting economic uncertainty. Any management or similar governmental actions that might be enacted to enhance shrimp vessel operations as a result of this more accurate information would be shared by all participants in the shrimp fishery. However, fisheries other than the shrimp fishery would benefit from better management of bycatch species, and this would enhance the benefits to users of these other fishery resources, including non-consumptive users.

With respect to economic costs, a shrimp logbook form was developed for the Summer 1998 Gulf Red Snapper/Shrimp Research Program. This form could serve as a template for a new logbook program in the Gulf shrimp fishery. That form basically mimics the list of data elements contained in Alternative 8.A, Options 2 and 3. The form would be completed on a daily basis. According to the Paperwork Reduction Act clearance package for that data collection program, it was anticipated that shrimp fishermen would need 10 minutes to complete each daily logbook form.

Regarding the 2,951 federally permitted vessels, information on trip length was available for 684 of these vessels (23.2% of the fleet) on at least one or more of their trips in 2002. These data indicated that, on average, trip length was approximately 15 days. The data also indicate that this group of permitted vessels took a total of 35,850 trips during 2002. Therefore, the total number of days at sea for this group of vessels is estimated to be 537,750, which yields an average of 182

days at sea per vessel. Further, the average annual time burden per vessel would be approximately 30.33 hours, or slightly more than 89,503 hours for the fleet under Alternative 8.A, Option 2 (i.e. paper logbooks are required for all permitted vessels).

From an economic perspective, even though there is no direct cash expense from a paper logbook program, there is an opportunity cost associated with any time burden created by additional reporting requirements. Typically, the opportunity cost is approximated using the average wage or salary of the affected persons. Since vessel owners/captains would be responsible for submitting the logbook forms, it would be most appropriate to use the average wage of first line supervisors/managers in the fishing, forestry, and farming industries. As of May 2003, which is the most currently available information, the Bureau of Labor Statistics reported that the mean wage of persons in this occupation group was $18.14 per hour.

Therefore, the average annual opportunity cost per vessel of the paper logbook reporting requirement would be approximately $550.19 ($18.14/hour * 30.33 hours). For the fishery as a whole, the average annual opportunity cost would be approximately $1,623,611 ($550.19/vessel * 2,951 vessels) under Alternative 8.A, Option 2. If only a sample of vessels is selected to report, as would be the case under Alternative 8.A, Option 3, then the burden estimate would be proportionally less and dependent on the chosen sampling rate. For example, if 20% of the vessels were required to submit paper logbooks (i.e. approximately 590 vessels), then the annual opportunity cost for the fishery would be approximately $324,612. However, given the Council's preferred alternative under Action 10, the potential paper logbook reporting requirement would only apply to the 2,666 vessels that qualify under that alternative. Thus, the opportunity cost of this program would be $1,466,807 for the permitted fleet or $293,521 for a 20% sample under the proposed moratorium.

Another method that can be used to collect effort data is electronic logbooks (ELBs). Option 2 under Alternative 8.B (electronic logbooks) could remove most of the burden associated with the collection of effort data by paper logbooks. Preferred Option 3 under Alternative 8.B would be even less burdensome in that only a sample of vessel permit holders would be required to participate in an electronic logbook program. Gallaway et. al. (2003b) utilized an electronic logbook that combined a GPS with a recording of trawling speed to determine when, where, and for how long a vessel was fishing. This device was removable following each trip and allowed the data to be downloaded into a computer for analysis. Such a system could greatly reduce the burden of effort reporting on fishermen while improving the database on effort. Other types of electronic logbooks have also been used in other fisheries. The major impact for the choice of electronic logbooks would come from who pays for them and their cost. The version used by Gallaway et. al. (2003b) cost approximately $500.

At this time, it is assumed that NMFS and not the industry would absorb the cost of purchasing these units. If NMFS purchased these units for all of the currently permitted vessels (Alternative 8.B, Option 2), the total cost would be approximately $1,404,500. Again, however, given the Council's preferred alternative under Action 10, ELBs would only be placed on the 2,666 qualifying vessels and thus the total cost would be $1,333,000. Though it is a direct cash expense, it is slightly lower than the opportunity cost to the industry of a paper logbook program. If only a

sample of vessels were required to place electronic logbooks on their vessels (Alternative 8.B, Preferred Option 3), the cost to the government would be reduced proportionally according to the selected sample size. For example, if only 20% of the currently permitted fleet were required to use ELBs, then the cost to the government (and thus to taxpayers) would only be around $295,000. The cost would be $266,500 given the Council's preferred alternative under Action 10. From a time burden perspective, since the fishermen would not be required to record any information, but rather only send in or otherwise provide the unit on a regular basis for data downloading purposes, ELBs would be far less burdensome to the industry relative to paper logbooks.

Additional costs would be imposed on the government as a result of managing either a paper logbook program or an ELB program. Though these costs are not imposed on the industry, they are costs to the public since taxpayers will ultimately have to foot the bill for such programs. Under Alternative 8.A, Option 2, the cost of implementing a paper logbook program that would cover all permitted vessels is estimated to be $906,680. If only a sample of these vessels are required to report, as under Option 3, the estimated cost is reduced to $194,136. Given the reduction in paperwork, it is logical to conclude that the costs of collecting, maintaining, and compiling data from the ELBs would be less than those of a paper logbook program. In fact, the estimated cost of such a program under Alternative 8.B, Option 2, is $210,100. If only a sample is selected, as under Preferred Option 3, then the cost is reduced to $94,380.

As indicated in Alternative 8.C, observers are another means to collect effort and particularly bycatch data. Option 2 under Alternative 8.C would utilize the existing observer program which has a limited sampling program and relies on voluntary participation. As noted in the discussion of effort interview data, such approaches can easily lead to the collection of insufficient and biased/non-representative data. Assuming sufficient finding, Preferred Option 3 could offer a more random and broader sampling of the type and amount of bycatch. To ensure cooperation, any vessel that refused to participate could lose their permit to fish if they did not participate.

The use of observers in a fully functional program would provide better information on individual catches and trips than the existing program (Alternative 8.C, Option 2) because such data would be collected from a larger number of actual commercial shrimping operations. However, it is not practicable to fund enough trips to preclude the need for extrapolation using the existing effort data or improved effort data from some type of logbook program (Options 2 or 3 under Alternatives 8.A or 8.B). Given previous information on the number of days at sea by currently permitted vessels, and an estimated cost of $1,000 per day for an observer, the total cost of a program that covered all vessels would be nearly $538 million. Even given the slightly smaller permitted fleet resulting from the Council's preferred alternative under Action 10, the cost would be $485.2 million, which is still an extremely onerous amount. With a sampling rate of only 5%, which is a common standard in other observer programs, the cost of the program would still be about $27 million (slightly less, or $24 million, given the Council's preferred alternative under Action 10). At this time, it is assumed that the industry would not be asked to cover any of these costs. Even so, this would be a significant cost to NMFS and thus to taxpayers. So, at least with respect to effort data, paper or electronic logbooks appear to be the more efficient options, whether they are imposed on all permitted vessels or only a sample. However, that still leaves the issue of bycatch composition data (i.e. type and amount) unresolved. Given the need for highly knowledgeable and

motivated individuals to record the information in order to ensure accuracy, and a desire to minimize adverse impacts on the industry, observers appear to be the only reasonable choice. For example, perhaps a lower sampling rate of 1% would be sufficient to generate the necessary information regarding bycatch composition, as long as randomness could still be guaranteed. Such a sampling rate would at least reduce program costs to a more manageable $5.4 million, approximately (or $4.85 million given the Council's preferred alternative under Action 10).

Between 1992 and 2003, funding for the voluntary Gulf shrimp observer program averaged between $750,000 and $800,000. This level of funding is lower than what might be desired given the information above. However, even if funding did not increase, there would still be gains in the statistical accuracy of estimates generated from this data if the sampling of vessels was truly random and mandatory. Only 158 vessels have participated in the program during this time, and the vast majority of those vessels have come from only two of the five Gulf states. This fact leads to the conclusion that the samples have not been random and thus the collected data are likely not representative of the fleet. Randomness can only be assured through a compulsory program.

Even if the coverage and funding issues can be resolved, there are other economic and social impacts to be considered. Specifically, having an observer on-board generates liability concerns for vessel owners. Given the high costs of insurance and, according to anecdotal information, the lack of insurance coverage within the fleet, this alone could pose a significant cost on the industry. This problem would not exist if observers came with their own insurance, though it is not clear if this solution is feasible. Additionally, some observer programs have seen fishermen change their fishing behavior in response to the presence of an observer on their vessel, particularly when the imposition of the program was clearly not desired by the industry, and it played no role in its creation or implementation. If the observer is perceived as a spy that cannot be trusted to protect confidential information, or even a nuisance in terms of interfering with the vessel's normal on-board operations, a vessel captain may decide to cut his trip short in order to minimize the observer's time on board. Another burden comes in the form of space on board the vessel. Observers would have to be quartered in some fashion, and many shrimp boats do not have available space. That is, in order to carry an observer, they would have to take one less crewman. In the current economic climate, available data suggest that many vessels have already cut back on their crews, and cutting back further may not be feasible if the vessel is to continue operating. For smaller vessels that have less flexibility with regard to accommodating additional persons on board due to simple lack of space, some sort of exemption status may need to be granted in such instances. This is a clear concern given the number of permitted vessels that are less than 60 feet long (approximately 732 vessels given the Council's preferred alternative under Action 10).

While observer programs are an intrusive data collection system, and considered an invasion of privacy by some fishermen, according to Kathi Kitner (personal communication), a majority of South Atlantic shrimp fishermen interviewed in the past four years have expressed a desire tohave observers on their boats. At various meetings in the Gulf over the past year, numerous Gulfshrimp fishermen have expressed a similar desire. They want to be a part of the research process, show people how they work, and demonstrate their knowledge. Fishermen claim that they are frequently ignored by scientists and managers, who fishermen believe should spend more time on the water.

However, if an observer program is to be successful, it should be sensitive to cultural traditions, as well as the type and size of vessels. For example, it will likely be more difficult for small vessels to carry an extra person onboard, and some allowance should be made for such situations. Some fishermen may be resentful if an observer program is mandatory. Some of this animosity may be lessened if fishermen do not have to cover the costs of the program, are adequately compensated in some form (monetary, social capital, cooperation in research) for carrying observers and if the observers are well trained, have experience on sea-going vessels, get along with fishermen, and are not perceived as a burden. An observer program may also be more accepted if it meant less burden with respect to other data collection programs. For example, if the presence of observers meant that less information had to be collected via a paper logbook, or if fewer fishermen had to fill out paper logbooks or carry an electronic logbook, the observer program might be better received by the industry. A well designed training program for both observers and fishermen would enhance the success of an observer program. It would also enhance data collection in general. Observers could also be trained to gather basic social and economic data and expand the knowledge of this important aspect of fisheries. Outreach and training programs could engender better working relationships between fishermen and fishery managers.

In addition to observer data, Options 2 or 3 under Alternatives 8.A or 8.B could require the use of paper logbooks or electronic logbooks to collect effort that would then be used to estimate bycatch and other important measures. There is a probability that at least some, possibly many, captains and crew would not want to participate in logbook programs, particularly paper logbooks, which would impose a much greater time burden on them relative to ELBs and could thus interfere with onboard operations of the vessel. Part of their concern is that this information could somehow be leaked out to others, who would then use it to their benefit, which would in turn reduce the information's usefulness. This burden could result in animosity toward fishery managers which could in turn result in the inaccurate reporting of fishing effort and related data. The same concern arises with observers. Though less burdensome, ELBs could also be perceived as an invasion of privacy, though they would not be subject to intentional mis-reporting of data as paper logbooks would be. However, outreach and training may lessen this problem. Also, if fishermen could be reasonably assured of the data's confidentiality, their animosity might be reduced. Only requiring the logbooks from a sample of vessels rather than all permitted vessels (under Option 3 of either Alternative 8.A or 8.B) could also reduce the burden. Though, on the other hand, sampling can also generate concerns about equitable sharing of the burden across fishery participants. Whether paper logbooks, ELBs, or observers, individual fishermen do not like to be selected repeatedly and, as a result, feel like they are being singled out or carrying the burden on behalf of their peers.

Even if fishermen are willing to participate in a paper logbook program, they may not possess the correct information when they fill out logbooks. Fieldwork observations and interviews have shown that many fishermen that are currently required to fill out logbooks do so after they return from fishing, or have the fish house fill out the logbook for them. This practice can lead to poor data collection. Again, this problem could be overcome with ELBs that would automatically collect effort information including vessel location, date, speed, etc.

While a combination of a paper logbook or electronic logbook, and observer programs may appear to be optimal with respect to collecting all the necessary information with the least burden on the industry, there is a potential for problems with data-sharing, data compatibility, and continuity in research programs that may impair assessment efforts. Furthermore, given that NMFS would incur the financial costs of implementing any/all of these programs, the availability of sufficient funding to run these programs at levels that would ensure the collection of adequate data is a concern.

The No Action alternatives (Option 1 under Alternatives 8.A, 8.B, and 8.C) would only consider data that currently exists and might not generate any direct social impact to the shrimp fishery with respect to collecting information on effort and bycatch. However, there are few data available on bycatch, and there are serious concerns regarding the accuracy and representativeness of the available effort data. The No Action alternatives could be detrimental to the fishery and may not comply with the M-SFCMA's requirement to have a standardized bycatch reporting methodology. Should there be doubt about the health of a bycatch fishery or species, the damage shrimp trawling may be inflicting on other species or habitat, the Council and NMFS would likely adopt a precautionary approach. It is conceivable that better data would allow for less onerous restrictions on the fishery, which may have more significant social impacts. In other words, under the No Action alternatives, because no new information would be collected, and management decisions would be based on information that might not be applicable to the fishery. More restrictive regulations to reduce bycatch mortality may need to be introduced, which would impose a social cost of currently unknown magnitude.

Action 9: Alternatives for completion of a Gulf Shrimp Vessel and Gear Characterization Form

> **Alternative 9.A: No action - do not provide a Gulf Shrimp Vessel and Gear Characterization Form to the vessel owner or operator receiving or renewing a federal shrimp vessel permit**
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> **Preferred Alternative 9.B: As a condition for receiving or renewing a federal shrimp vessel permit, all vessel owners or operators are required to provide to the NMFS a completed Gulf Shrimp Vessel and Gear Characterization Form that will be provided by NMFS to the permit holders**
>
> **Alternative 9.C: As a condition for receiving or renewing a federal shrimp vessel permit, a vessel owner or operator is required to provide to the NMFS a completed Gulf Shrimp Vessel and Gear Characterization Form that will be provided by NMFS to the permit holder if the vessel owner or operator is part of a subset of permit holders that have been randomly selected to complete the form**
>
> **Alternative 9.D: Do not require vessel owners or operators to provide to the NMFS a completed Gulf Shrimp Vessel and Gear Characterization Form when receiving or renewing a federal shrimp vessel permit, but make it available and voluntary**

Discussion and Rationale: Currently there is limited information on vessels and gear used in the shrimp fishery of the Gulf, other than the size of vessels. This information is needed in order to estimate real or effective effort (as opposed to nominal effort) and bycatch as well as operating costs and profitability. It is also needed to obtain a stratified random sample for further studies that would characterize the fleet's operations and economic performance. Although Option 2 of Alternative 8.A would provide much of the needed information as part of a bycatch reporting methodology, a potentially simpler approach would be to provide such information on an annual basis when renewing the vessel permit. If vessels do not frequently change the nature or configuration of their gear throughout the year, then requesting such information via this form would be far less onerous on the industry relative to paper logbooks that would request the information on a set or trip level. Furthermore, requiring this information as with Preferred Alternative 9.B would strengthen the support for ELBs as with Alternative 8.B, Options 2 or 3, because some of the needed information to accurately measure effort (e.g. trawl size, type and number of trawls, and type of TEDs and BRDs) would not be collected by ELBs, but could be collected through this requirement. For the reasons stated below under the "Socioeconomic Impacts," requiring a sample of vessels to provide this information or a voluntary program as with Alternative 9.C or Alternative 9.D, respectively, would not provide appreciably better information than the No action Alternative 9.A.

Biological Impacts: There would be no biological impacts from an action to mandate or voluntarily require shrimp vessel permit holders to submit a Gulf Shrimp Vessel and Gear Characterization Form (see example in Appendix B). The intent of this form is to obtain information regarding gear and vessel characteristics of the shrimp fleet in the Gulf in order to track changes and to evaluate the biological, economic, and social impacts of management measures. Furthermore, as stated in Action 8, some of the information could substitute for information that would be collected from paper logbooks. None of the alternatives would change fishing effort, catch, bycatch, or any other factors that may cause biological impacts.

Socioeconomic Impacts**:** The vessel and gear characterization form would be sent along with the permit application form, and could be returned at the same time, thereby minimizing any expense associated with mailing of the form. The only economic cost associated with the form would be the time burden associated with its completion, which is estimated to be approximately 30 minutes in its current form. However, depending on the exact nature and coverage of the data to be potentially collected within the alternative programs being considered under Action 8, some questions may not be necessary and could be removed, thereby reducing the time burden by as much as 10 minutes. Using the previously discussed methodology for estimating the opportunity cost of time burdens, the form would create an annual opportunity cost of between $4 and $9 per vessel, and between approximately $10,600 and just over $24,000 for the entire permitted fishery. Given the Council's preferred option under Alternative 8.A, all questions on the example form would need to be asked and thus the higher burden estimate is likely more accurate. Although collecting this information from only a sample of permitted vessel owners would impose this cost on fewer vessels and decrease the burden on the fishery, its usefulness would be significantly reduced. In order for the information to be used as a means to develop sampling designs for other programs, the information needs to be collected for the entire fleet (i.e. at the census level).

The social costs associated with Preferred Alternative 9.B are minimal, and only result from the time burden and resulting inconvenience. However, in combination with the other existing and proposed reporting requirements, some fishermen could feel overly burdened. The fact that this form is only to be filled out once a year should mitigate that feeling of being overly burdened. Only requiring the form for a sample of vessels (Alternative 9.C) could reduce that burden, but would also defeat the form's primary purpose, which is that the data be used to develop random sampling designs for the other data collection programs which would in turn ensure that data representative of the fishery are being collected. How these various data collection programs fit together needs to be explained to the fishermen in order to reduce some of their concern. Should the form be voluntary (Alternative 9.D), issues of response rate, response bias, and thus representativeness of the information would severely hamper the data's usefulness.

In general, the only alternative that would generate positive net social and economic benefits is Preferred Alternative 9.B. Otherwise, the next best option is to not implement the form and select "No action**,"** Alternative 9.A.

Action 10. Alternatives to establish a commercial shrimp vessel permit moratorium

> **Alternative 10.A: No action - Continue to issue non-transferable commercial shrimp vessel permits.**
>
> **Preferred Alternative 10.B: Establish a 10-year moratorium on the issuance of commercial shrimp vessel permits. To be eligible for a commercial shrimp vessel permit under the moratorium, vessels must have been issued a valid commercial shrimp vessel permit by NMFS prior to and including December 6, 2003.**
>
> **Alternative 10.C: Establish a 10-year moratorium on the issuance of commercial shrimp vessel permits. To be eligible for a commercial shrimp vessel permit under the moratorium, vessels must have been issued a valid commercial shrimp vessel permit by NMFS prior to and including May 18, 2004.**
>
> **Alternative 10.D: Establish a 10-year moratorium on the issuance of commercial shrimp vessel permits. To be eligible for a commercial shrimp vessel permit under the moratorium, vessels must have been issued a valid commercial shrimp vessel permit by NMFS during the 365-day period prior to and including the date of publication of the final rule implementing this amendment.**

NOTE: Prior to the implementation date of this amendment, commercial shrimp vessel permits are non-transferrable. Following the implementation of this amendment, commercial shrimp vessel permits are freely transferrable either with the sale of the vessel or to another person (corporate or otherwise). However, during this non-transferrable period the following shall apply for vessels and owners that met the criterion under either Alternative 10.B or 10.C:

(1) An owner (corporate or otherwise) who sells his vessel, has his vessel repossessed, or otherwise loses or loses the use of his vessel (through damage, sinking, unaffordable repairs, etc.), but obtains a valid commercial shrimp vessel permit for the same vessel or another vessel that is equipped for offshore shrimp fishing and is at least 5 net tons prior to the date of publication of the final rule implementing this amendment shall be eligible to renew such permit under the moratorium.

(2) Other than as described in "1", only those vessels that met the preferred criterion as established in Alternatives 10.B, 10.C, and 10.D shall be eligible to renew a commercial shrimp vessel permit under the moratorium.

Discussion and Rationale: According to Nance (2004a), the shrimp fishery in the Gulf of Mexico currently has enough effort such that an initial reduction in effort would not result in a reduction in catch, particularly of brown shrimp (the major species). This statement would probably be true for bycatch as well. In other words, there is excess capacity in this fishery and fewer vessels could harvest the available shrimp resources at a more profitable level. In fact, since late 2001 the fishery has been operating at a negative profit margin due to competition with foreign imports, primarily aquacultured shrimp. The resultant reduction in price for shrimp has been good for the consumer, but it is forcing shrimp vessels (particularly larger, offshore vessels in excess of 60 feet in length) out of the fishery. Under any of the alternatives, it is expected that vessels will continue to exit the fishery until approximately 2012 when the number of vessels will be reduced to a level such that the available resource can be harvested profitably.

Alternative 10.A (no action) would potentially allow vessels to enter the fishery after it has stabilized thereby potentially negating economic benefits from the downsizing. Additionally, it would allow an unlimited number of speculators to obtain permits in hopes of being able to sell them in the future that could lead to a similar negative economic impact. Preferred Alternative 10.B and Alternatives 10.C and 10.D would establish a moratorium on the issuance of new shrimp vessel permits. The only difference in these alternatives relates to the qualifying date under which vessels would be allowed to renew their permits once the moratorium goes into effect. Preferred Alternative 10.B would be the most restrictive in that only those vessels or individuals that owned vessels that obtained a permit prior to the published control date of December 6, 2003, would be eligible to renew their permits once the moratorium goes into effect. Alternative 10.C would be slightly less restrictive in that it would qualify vessels/individuals that obtained a permit prior to May 18, 2004, (the date that the Council decided to add a moratorium action to this amendment). Alternative 10.D could be the least restrictive because any vessel that is issued a valid permit during the 365-day period prior to publication of the final rule implementing this amendment would be eligible to renew said permit under the moratorium.

Under Preferred Alternative 10.B or Alternative 10.C, vessels or owners of vessels that lose their permits following the specified dates, but obtain new permits for the same vessel or another vessel that is equipped for offshore shrimp fishing and is at least 5 net tons prior to the date of publication of the final rule implementing this amendment, shall be eligible to renew such permit under the moratorium. This provision is intended to preclude negative economic and social impacts to individuals that subsequent to obtaining a permit were forced to exit the fishery for a period of

time. It is also intended to only allow those vessels that are capable of and likely to fish in the EEZ to reenter the fishery. Under Alternative 10.D, vessels and owners would not be affected by this provision if they obtained a permit during the 365-day period prior to publication of the final rule for this amendment. Additionally, if a vessel entered the fishery during this period, but subsequently left the fishery, it would still have an additional year to reapply for a permit before it would expire.

Biological Impacts: There should be no significant biological impacts of any of the alternatives to establish a moratorium or to continue the shrimp fishery under open access. As noted by Nance (2004b), the shrimp fishery has not been considered as undergoing overfishing or being overfished since the establishment of these definitions or the definitions proposed in this amendment. Furthermore, as noted in the discussion above, the level of participation has been declining in recent years due to competition with imports and high fuel costs, and it is expected to continue until at least 2012.

Although the number of vessels has declined, effort has remained high due to increased efficiency of the vessels that have remained in the fishery over time and new vessels. However, 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. Increased effort primarily in the early to mid 1980s, and primarily from federal subsidies for vessel construction, probably caused an increase in bycatch in the shrimp fishery. Whether this increase in bycatch was significant is unknown, but the majority of shrimp trawl bycatch is made up of short-lived species like shrimp whose abundance in a given year is also mostly dependent on environmental factors as opposed to fishing mortality (GMFMC 1997). However, recent reductions in the number of vessels and the requirement of bycatch reduction devices in 1998 (for the EEZ west of Cape San Blas, Florida) and 2004 (for the rest of the west coast of Florida), have ameliorated or possibly negated any significant impacts to bycatch species that may have occurred in the past. In summary, although a moratorium is not expected to have any significant impacts to bycatch, to the extent that effort is capped or possibly reduced through attrition of vessels, there is a potential that positive impacts to bycatch species would ensue. Any such impacts, however, are expected to be small, particularly in the short term.

Socioeconomic Impacts: There is a need to temporarily address the issue of participation in the fishery until a long-term effort management program can be developed and implemented. Participants in the shrimp fishery are experiencing economic hardship primarily related to depressed prices and high fuel costs. Particularly as a result of the significantly reduced prices, the value of the shrimp resource in the Gulf has decreased. As a result, the fishery cannot support as many participants as it has historically. Anecdotal evidence indicates that many vessels, particularly larger vessels, have gone into bankruptcy and been subsequently repossessed, which in turn has caused significant disruption with respect to social and business relationships, both within and between communities associated with the fishery. Under the assumption that external factors such as imports, fuel prices, and other costs remain unchanged from their 2002 status, economic projections currently predict a decrease in effort as a result of the continuing exit of

vessels through the year 2012. Thus, the social and economic disruptions in the communities most strongly associated with the fishery are expected to continue for some time.

The Council may consider long-term effort management programs in the future. The immediate problem is the potential for new vessels to enter the fishery by obtaining federal permits, which could reduce the benefits of a long-term effort management program in general and particularly to current participants. Under the current economic conditions, the vast majority of new entry would likely be purely speculative. Increases in the number of active participants in the fishery would not be sustainable under the current economic conditions. However, the global market is unpredictable, and the potential exists for external factors to improve long-term market conditions (i.e. shrimp and fuel prices). Even with improved economic conditions, any increased active participation in the fishery would cause the already reduced size of the "economic pie" to be shared with more vessels/people, thereby leaving smaller pieces of that pie for current participants and slowing down the industry's economic recovery. Under such circumstances, the probability of social conflict within the industry would increase, perhaps dramatically. There is some anecdotal evidence that such conflicts are and have been occurring as participants scramble to protect their "piece of the pie."

Furthermore, current fishery participants have been exerting considerable effort to improve their economic condition through a variety of approaches, including attempts to improve product quality via a product certification program and several aggressive marketing campaigns. Should those efforts be successful, the demand and thus the prices for domestic, wild shrimp would increase. The same result may occur if industry participants are successful in their attempts to have tariffs imposed on farmed, foreign shrimp, which they assert have been "dumped" into the U.S. market. The point is that, from the perspective of current industry participants, since they have borne the hardships and expended the resources in an attempt to reverse the industry's economic fortunes, then, under any reasonable concept of what is equitable, they should be the ones to benefit from their efforts. In economic parlance, what would be prevented is the possibility of "free-rider" behavior. "Free-rider" behavior occurs when one group of people allows others to bear all the costs of a particular action, but then later partakes in some of the benefits. Such behavior is considered not only "unfair," but is also inefficient if encouraged because it will eventually create a perverse incentive system wherein all individuals would eventually engage in such behavior and the desirable actions would not occur. In effect, the permit moratorium is one means to dissuade such behavior.

At present, since the shrimp permit is an open access permit and thus can be obtained by anyone, assuming the proper paperwork and fee are submitted, permits are not currently transferable. However, current fishery participants are keenly aware that the Council established a control date of December 6, 2003. The establishment of the control date was a signal to fishermen that, should they desire to continue to participate in the fishery, they needed to obtain a permit by that date or face the possibility that they would not be allowed to participate should the Council decide to implement a limited entry or other form of effort management program in the future. Furthermore, many are also aware that a permit moratorium is an action currently being considered within this amendment, and that multiple alternatives are also being considered under that action; alternatives

that will have different implications for their livelihoods depending on when and whether they have already obtained a permit.

Many fishermen have expressed apprehension regarding the establishment of the control date because, in other fisheries, this has generally meant that a limited entry system will be implemented in the near future. "Limited entry" is a term that some fishermen strongly dislike, because they see it as a means for government to kick people out of the fishery, and thereby take their livelihoods away. The potential for strong resistance from industry participants increases if they believe that the criteria for continued participation are arbitrary or unfair, which of course has everything to do with how those criteria would affect each in their ability to continue operating in the fishery. For some though, it is not just about their continued participation, but allowing their family, friends, and colleagues to also continue earning a livelihood in the fishery. This is a particular concern for families that have participated in the fishery for multiple generations. It is also a strong concern for vertically integrated businesses that are involved in the harvesting, wholesale, and processing sectors since disruptions in the former can lead to disruptions in the latter two components of the operation.

The combination of the control date and the non-transferability of current permits has created a problematic situation for many current Gulf shrimp vessel owners, and those who desire to become owners of current Gulf shrimp vessels. In general, these two groups of individuals are caught in a business decision paradox. Many vessel owners apparently have a desire to sell their vessels, which is to be expected under the current economic conditions. While the demand for such vessels may not be considerable, nonetheless anecdotal information suggests that such demand exists. Since permits are not transferable with the sale of the vessel under the current system, a new owner must obtain a new permit. While that is allowable, the new permit would be assigned an effective date associated with the time of the new owner's application, <u>not</u> the date of the original owner's permit. Therefore, although the original owner's permit may have been dated prior to the control date, at this time, a new owner's permit would have an effective date beyond the control date. At present and until the Council acts, it is uncertain whether the new owner would be given a permit under a potential moratorium. If the previous vessel owner did not have a vessel permit, or at least not one dated prior to the control date, then the potential new owner's future in the fishery is even more uncertain. Prudent businessmen understand that purchasing a vessel under such circumstances would be financially risky and thus they are hesitant to engage in such transactions. For current vessel owners, the current situation prevents them from selling an asset that they no longer wish to own. Therefore, they must continue to operate their vessels or tie them up. In either case, they are likely to continue losing money since certain expenses, such as boat payments, insurance, mooring fees, etc, must be paid regardless of whether their vessels are active or not. In short, the current system is preventing potential buyers and sellers from engaging in transactions from which they would both benefit (i.e. efficient exchanges), and creating considerable business uncertainty for current and new vessel owners. In other words, current vessel owners who want to sell their vessels and change the way in which they earn their livelihood are under considerable stress and feel like the government has put them in this predicament, just as potential vessel owners feel that the government is responsible for creating an uncertain business climate, which they feel is unnecessary and unfair.

Therefore, the moratorium should help to address both a long-term problem and a short-term problem. The short-term problem is the box that existing and potential new shrimp vessel owners are in as a result of: 1) the control date being established, 2) that date is already past, 3) current permits are not transferable with their vessels, and 4) the effective date on any new permits would be past the announced control date. Allowing the permits to become transferable would eliminate or at least significantly reduce the existing economic uncertainty in the market, thereby encouraging efficient business exchanges, and also eliminate or at least significantly reduce the stress and social disruptions arising from the current system.

In the long-term, the problem has two components. First, for an assortment of reasons, additional vessel owners may decide to obtain a permit for speculative purposes. Should they become active in the fishery, their participation would add to the industry's existing economic woes and thereby create additional social conflict within the fishery. Further, the inclusion of additional vessels would complicate the creation of a long-term effort management program, dissipate the benefits from such a program, and redistribute those benefits from current to new fishery participants. Such a result could be seen as both inequitable and inefficient if allowed to occur. If the Council is going to consider such a program, controversy should be reduced if the group of affected people is limited to those who have already been participating in the fishery as opposed to including "outsiders" and "Johnny Come Latelys" who have not "paid their dues" in the view of current participants. Again, the issue is one of fairness. By capping participation to current participants, the moratorium should mitigate such conflicts in the future. However, it should be kept in mind that some fishermen, even under the current social and economic duress, still believe in the philosophy that the fishery should be open to any and all who wish to participate, a philosophy that has a long history among fishermen, particularly shrimpers. On the other hand, as conditions have worsened and current participants have had to expend considerable resources to improve their economic fortunes, it appears that this philosophy is waning in popularity, as evidenced by the Council's Shrimp Advisory Panel (AP) voting to support a moratorium.

Since the permits would be transferable under all but the No Action, Alternative 10.A, considerable additional discussion of that issue is not warranted. However, it should be noted that, since the permits will be transferable under Preferred Alternative 10.B and Alternatives 10.C, and 10.D, even if some vessel owners are not granted a moratorium permit, they will still have the opportunity to purchase a permit from individuals who are willing to sell. At this time, since the market for permits does not yet exist, it is impossible to predict with accuracy what the price of such a permit will be once a market does exist. As with all traded commodities, permit price will be a function of demand and supply conditions at the time of the desired purchase. Under normal conditions, a permit's price will typically reflect the expected stream of profit for a particular period of time, with that period of time depending on how long the holder intends to keep it. That is, this expected stream of profit will determine the price at which the buyer is willing to sell. The shorter the time period and the lower the expected stream of future profit, the lower will be the price. Thus, at least in the short-term, under current economic conditions, potential buyers should be able to purchase permits fairly cheaply. Conversely, permit owners who will want to sell, of which there may be many, should not expect their permits to command a high price in the short-term. However, if and when the fishery recovers economically, those permits will increase

in value. That increased value partially represents the previously discussed accrual of benefits to current permit holders.

Given the lack of an existing market for Gulf shrimp permits, in theory, it is possible that information regarding the purchase price of other transferable permits may provide some insights into the potential prices of Gulf shrimp permits once they become transferable (i.e. other permit prices might serve as a viable proxy). Several permits in commercial fisheries of the Southeast Region are presently transferable, including king mackerel, Gulf reef fish, Gulf red snapper, South Atlantic snapper-grouper, South Atlantic rock shrimp, swordfish, and shark. However, none of these fisheries circumstances are closely comparable to those of the Gulf shrimp fishery within the EEZ. Specifically, with the potential exception of the South Atlantic rock shrimp fishery, none of these fisheries have recently experienced the same precipitous decline in economic performance as has been seen in the Gulf shrimp fishery. Further, in general, the Gulf shrimp fishery is a much larger fishery in terms of vessel numbers and, with the exception of the South Atlantic rock shrimp fishery, is generally composed of larger, more powerful vessels relative to these other fisheries that tend to earn much higher levels of annual gross revenues. Though the South Atlantic rock shrimp fishery may be the most comparable in certain respects, it is a much smaller fishery with respect to the number of permitted vessels (approximately 145), and thus the number of permits available for sale at any point in time will be much smaller. The more scarce a commodity, the greater will be its selling price, *ceteris paribus*. Thus, in theory, Gulf shrimp permit prices should be less than South Atlantic rock shrimp permit prices, at least in the short-term.

Current information on South Atlantic rock shrimp permit prices indicates that they have been selling for approximately $10,000 on average since the permits became transferable two years ago.[2] Given the reasons noted above, Gulf shrimp permits should sell for less than $10,000 on average in the short-term. In reviewing all transferable permit purchase prices from November 2004 through May 2005 within the Southeast Region, the average is approximately $5,000. At this time, this value is the best estimate of the likely price of Gulf shrimp permits in the short-term, and thus will be used in subsequent analyses.

Although specific permit prices cannot be forecast with much certainty under Preferred Alternative 10.B, or Alternatives 10.C or 10.D at this time, it is likely that the price of permits will be slightly greater under Alternative 10.D than under Preferred Alternative 10.B, which in turn may be slightly greater than under Alternative 10.C (i.e. permit price may be lowest under Alternative 10.C). This conclusion is based on the likely number of permits that will be demanded relative to the number that will be available/supplied. Since Alternative 10.D will exclude the greatest number of vessels, thereby likely generating the greatest demand for permits and, in turn, yield the fewest number of permits (i.e. the lowest number available/supplied), it is logical to conclude that permit price will be greatest under Alternative 10.D, unless there was an influx renewal or speculative permits, which is highly unlikely. Conversely, Alternative 10.C excludes the fewest vessels and permits the greatest number of vessels, which should lead to a lower permit price. However, as discussed later, this conclusion must be qualified by the possibility that, of the vessels that did not have permits in calendar year 2005, through the month of May, and which are

[2]This average excludes several values of $1 and $10, as these are likely not reflective of actual market values, but rather indicate transfers between individuals with close personal and/or business relationships.

assumed to not qualify for a moratorium permit under Alternative 10.D, some or all of those vessels (and perhaps others) may yet renew or obtain permits prior to the publication date of the final rule that will implement this amendment. Should all of those vessels (and perhaps others) renew or obtain their permits prior to that date, then Alternative 10.D would yield the lowest demand, the greatest supply, and therefore the lowest permit price since none of the known 2,951 vessels that have had permits would be excluded. At this time, it is not possible to determine how many of those vessels will actually renew before the final rule's publication.

At least some of those who will be put in the position of having to purchase a permit may resent and be apprehensive of the fact that, in order to participate in the fishery, they will have to find someone who is willing to sell their permit at a price that they can afford. Thus, to a large degree, their continued participation will be dependent on the desires of those people who have permits and thus would be uncertain in the short-term. Further, their lack of experience with such situations will be an additional source of trepidation.

As between the alternatives, the previous discussion should be sufficient to conclude that the net economic benefits of the No Action, Alternative 10.A, are clearly negative. Regarding the other alternatives, the most economically desirable option is the one that achieves the desired outcomes or objectives at the least cost to the industry and society in general. As already noted, permit transferability is a component of each alternative, and this action will solve the short-term problem. Therefore, the question is which of the alternatives will solve the long-term problem. The answer is, all of them. The basis for this statement lies both in theory and in some recent analyses of this general issue.

In general, though with the possible exception of Alternative 10.D, the differences between the other alternatives are relatively minor with respect to the number of vessels that will be allowed to participate in the fishery under the moratorium, and with respect to the amount of effort that will be potentially removed, at least relative to the total number of vessels and total effort level in the fishery. In other words, the differences between the alternatives are not sufficiently significant to put the fishery on substantially different recovery paths. This point is illustrated in the analysis of the fishery's current economic status and by future projections of economic performance and effort within Travis and Griffin (2004). That is, based on this analysis, it can be deduced that significant changes in fishery participation and effort, shrimp prices, and/or operating costs would be required to substantially hasten the fishery's economic recovery. This point is more directly made in the analysis of a permit moratorium within the NMFS (2004). Although that analysis is not geared to the specific alternatives being considered in this amendment, it illustrates the most critical point. That is, future economic projections are not substantially different across permit moratoria or other effort management measures unless the changes in effort or changes in shrimp prices are significant (e.g. at least on the order of a 20% change).[3] This result is not surprising since, in general, all economic impacts dissipate over an extended period of time.

Therefore, since Preferred Alternative 10.B, as well as Alternatives 10.C and 10.D, could be reasonably expected to put the fishery on the same path and help solve the previously indicated

[3]That analysis did not examine the potential changes in recovery paths as the result of potentially lower costs, such as fuel and insurance.

long-term problem, the choice of the best alternative from an economic perspective depends on their relative short-term, adverse economic impacts with respect to how many and which vessels would be initially prevented from participating in the fishery, at least until such time that they could purchase a permit from a qualifying vessel. The results of such an analysis of short-term adverse impacts generated the following findings.

Before discussing the details of those short_term, adverse economic impacts, some assumptions need to be clearly specified in addition to those that have been previously stated. First, since the exact time frame associated with Alternative 10.D cannot be known at this time, given that the date of the final rule's publication cannot be perfectly foreseen, it is assumed that those vessels that had a permit with an effective date during calendar year 2005, through the date the permit data was most recently compiled (May 5, 2005), would be eligible for a moratorium permit.

Second, given that these vessels could still participate in the state waters component of the fishery without a permit, it was desirable to determine how many of the potentially affected vessels actually participate in the EEZ fishery and the level of that participation, as measured by shrimp landings and revenues. This is not a straightforward proposition since, with the exception of data collected by the states of Alabama and Louisiana which is then submitted to NMFS via the Commercial Fisheries Initiative (ComFIN) program, the landings data do not indicate whether the landings from a trip come from state or federal waters. For better or worse, the shrimp landings file (SLF) has historically tracked landings and effort according to depth zone, not political jurisdiction. Thus, for landings in Texas, Mississippi, and Florida, assumptions had to be made regarding which depth zones to include in federal as opposed to state waters. These determinations varied by statistical zone given the differences in depth zones along these states' coastal areas, and because state waters extend to 9 miles off of Texas and west Florida, but only 3 miles off of Mississippi. Upon completion of this task, each permitted vessel's activities were analyzed, assuming vessels were in fact active in the fishery, and broken down into landings and revenues accruing from state versus federal waters.

Finally, certain aspects of both the NMFS and Griffin et al. (1997) approaches to estimating effort were used in this case because of the scarcity of effort interview data, the fact that NMFS' effort estimates are not calculated back to the vessel level, and because the data from Alabama and Louisiana do not report depth zone, which is a variable used in both the NMFS and Griffin et al. (1997) methods.

First, with respect to Preferred Alternative 10.B, it was determined that, of the 2,951 vessels that have been issued permits, 285 did not meet the December 6, 2003, control date. That is, the number of permitted vessels would be 2,666. However, of those 285 vessels, 126 were not found to be active in the fishery during 2002. That is, these vessels were "inactive" or latent. As discussed in Section 5.4 of this amendment, the reasons for this finding could be numerous, and it should not be forgotten that data management issues are one of those reasons. In addition, 87 of the 285 vessels were determined to only operate in state waters. As such, there would be no direct economic effects on these vessels as a result of selecting Preferred Alternative 10.B. However, some consideration should still be given to the fact that they would be precluded from future

participation in the EEZ fishery, at least in the short-term and until such time that they could purchase a permit when a market develops.

That leaves 72 vessels that were found to be active in the EEZ fishery and thus would be adversely impacted under Preferred Alternative 10.B. Of these vessels, 45 are large and 27 are small. As a result of not being able to trawl in the EEZ, and assuming that the losses incurred by these vessels would only be landings and revenues from the EEZ, revenue losses for these vessels range from 0.8% to 100% of their total fishing revenues, with the average revenue loss being $43,342, or 49.3%. The total loss of revenues is approximately $3.12 million and the loss of landings is approximately 1.06 million pounds from the EEZ. The estimated amount of effort removed from the EEZ fishery is approximately 2,745 days fished.

Most of these losses would be imposed on the 45 large vessels, as they account for nearly 899,000 pounds of the lost landings, $2.75 million of the lost revenues, and 2,281 of the removed days fished. The other 162,000 pounds, $373,000 of lost revenues, and 464 days fished are from the 21 small vessels. This implies an average revenue loss of 54.3% for large vessels and 29.6% for small vessels. These types of losses could result in the vessels being forced out of the Gulf shrimp fishery completely, at least in the short-term. If the vessels are in fact forced to shut down, this would also cause a loss in employment of approximately 238 crew jobs (72 vessels * 3.3 crew per vessel on average).

With respect to impacts on dealers/wholesalers, 58 dealers would be adversely impacted as a result of the losses in landings and revenues to the harvesting sector. The range of their losses in shrimp sales ranges from 0% to 100%, with an average loss of 7% of sales. In the current economic climate, a 7% loss in sales would be considered significant for these businesses, particularly those with lower levels of sales.

In general, it is difficult to ascertain whether processors would be adversely impacted by this alternative, or Alternatives 10.C and 10.D for that matter. The problem lies in the fact that existing data do not indicate whether and how much of the product they use is domestic or imported. Such information is definitely not available at the firm level. Further, once shrimp are harvested and purchased, they are not tracked to the processor level. Thus, it is not possible to discern where shrimp go after they are purchased by dealer/wholesalers. The most that can be said is, if any processors use product harvested by the affected vessels, like the dealer/wholesalers, they would be adversely affected as well. This is particularly true for small to medium sized processors. On the other hand, given the prevalent use of imported product, processors may be able to substitute foreign product in place of any lost domestic product, though such a result would potentially not be seen as desirable by firms in either the processing or the harvesting sector.

Under Alternative 10.C, 161 vessels would not qualify for a moratorium permit. That is, the number of permitted vessels would be 2,790. Of those 161 vessels, activity in the fishery during 2002 could not be found for 68 of them and 46 operated in state waters only. That means that 47 vessels, 26 large and 21 small, were found to be active in the EEZ fishery and thus would be directly impacted under this alternative. The total losses to these 47 vessels are approximately 733,800 pounds of shrimp and $2.17 million in revenue from the EEZ component of the fishery.

Thus, the average loss in revenue is $46,203, or 48.4%. The number of days fished removed from the EEZ is 2,134. As under Preferred Alternative 10.B, the large vessels would account for the majority of these losses; 612,200 pounds, $1.93 million, and 1,733 days for landings, revenues, and effort, respectively. The percentage loss in revenue for large vessels ranges from 0.9% to 100%, with an average of 68.9%. Small vessels would account for the remaining losses of 121,600 pounds, $242,800 in revenues, and 401 days. The percentage loss in revenues for small vessels ranges from 1.1% to 100%, with an average of 22.9%. Assuming all vessels would be forced to cease operations in the short-term, the loss in crew employment is estimated to be approximately 155 jobs.

With respect to dealer/wholesalers, 48 would be adversely impacted. Their losses in shrimp sales would range from 0% to 100%, with an average of 7.5%.

Finally, under Alternative 10.D, based on currently available information as explained above, it was determined that 347 vessels would not be issued a moratorium permit. That is, the number of permitted vessels would be 2,604, which is less than under Preferred Alternative 10.B or Alternative 10.C. Of these 347 vessels, activity in the fishery during 2002 could not be found for 88. In addition, 72 vessels were found to only operate in state waters. The remaining 187 vessels were found to be active in the EEZ and thus would be adversely impacted under Alternative 10.D. Given that these vessels would have had a permit at some time between November 2002 and December 2004, the large number of potentially excluded vessels is likely a reflection of the number and nature of vessels that have been repossessed or have been tied to the docks for economically related reasons over the past year (i.e. the number is relatively high and the vast majority are large vessels, which allegedly have been those most subject to repossession). In such instances, given the possibility that these vessels may not operate in the fishery in the future, the current owners may not believe it worthwhile to renew their permits, or may not think it necessary if they believe the Council will select a different alternative under which their vessel would qualify, such as Preferred Alternative 10.B.

Regardless, the losses in landings, revenues, and effort to the fishery in the EEZ are approximately 4.84 million pounds, $15.57 million, and 12,875 days. The average loss of revenues per vessel is $83,259 or 71.8%, which is very high. Of the 187 impacted vessels, 168 are large and 19 are small. For the large vessels, average revenue loss ranges from 0.2% to 100%, with an average of 76%. They would account for the vast majority of the landings, revenue, and effort losses; 4.73 million pounds, $15.35 million, and 12,559 days fished, respectively. The loss in revenue to the small vessels would be much less, ranging from 0.9% to 100%, with an average of 35%. These vessels account for the remaining losses of 117,000 pounds, $219,500 in revenues, and 316 days fished. If all vessels cease operations, the expected loss in crew employment is 617 jobs.

Since the losses to the harvesting sector would be larger, the losses to the dealer/wholesaler sector would be larger under this alternative as well. Specifically, 88 dealers would be adversely impacted as a result of the losses in the harvesting sector. The loss in shrimp sales ranges from 0% to 100%, with an average loss of 8.6% in sales per dealer. Again, this average loss in shrimp sales is higher than under Preferred Alternative 10.B and Alternative 10.C.

With respect to evaluating impacts on processors, keeping in mind previous statements, any potential impacts in that sector would be less and the least likely under Alternative 10.C, followed by Preferred Alternative 10.B, with Alternative 10.D exposing them to the greatest risk of experiencing adverse impacts from the moratorium.

The impacts noted above only represent the direct impacts on the harvesting sector. Whenever an industry loses revenues/sales and associated jobs, the effects of those losses will spread to other associated industries within the local/regional economy. That is, when one company or industry loses revenues/sales, other companies and industries that conduct business with them will also experience a loss. For example, when shrimp fishermen lose revenues, they are not likely to buy as many inputs (e.g. fuel, ice, etc.) and they do not have as much product to sell to dealers and processors, who then also have less to sell to businesses at the retail level. These are commonly referred to as "multiplier effects." As a result of these effects, the losses to the local or regional economy will be greater than the initial, direct losses to the harvesting sector. Such losses pertain not only to sales or output, but to employment as well. According to NMFS (2004), the sales/output multiplier associated with domestic shrimp production is approximately 3.58. This means that, for every $1 of lost shrimp production, the total loss of sales/output to the economy will be $3.58. Similarly, the employment multiplier was estimated to be approximately 1.81. So, for every job lost in the harvesting sector, the total loss of jobs to the economy will be 1.81.

Given these multiplier values, with respect to the Preferred Alternatives 10.B, and Alternatives 10.C and 10.D, the expected total losses in sales/output and jobs are as follows: for Preferred Alternative 10.B, the losses in sales/output and jobs are $11.17 million and 431 jobs, respectively; for Alternative 10.C, the losses in sales/output and jobs are $7.7 million and 281 jobs respectively, and for Alternative 10.D, the losses in sales/output and jobs are $55.74 million and 1,117 jobs respectively.

It is important to keep in mind that the losses in landings, revenues, and the resulting multiplier effects noted above only account for the removal of activity from the EEZ component of the fishery. That is, one possible assumption to make when analyzing the impacts of these alternatives is that non-qualifying vessels operating in the EEZ will permanently lose landings and revenues resulting from their fishing activities in the EEZ, but will also continue their current operations in state waters. However, at least for the small vessels, there may be the option of shifting their activities completely to state waters. In general, small vessels tend to be relatively more dependent on landings from state waters and are relatively more capable of operating in those waters. Conversely, for large vessels, shifting all their effort to state waters is a much less viable option since they are relatively more dependent on landings from the EEZ and relatively less capable of operating in state and particularly inshore waters. Thus, it is very likely that large vessels would be forced to exit the fishery in the short-term if they do not qualify for a moratorium permit. If large vessels do in fact cease operations, their losses would be greater than the estimates given above since their landings and revenues from state waters would also be lost (i.e. they would lose 100% of their landings and revenues). All of their effort would also be removed from the fishery and all employment associated with their operations would be lost. Conversely, if small vessels can shift their effort from the EEZ to state waters, the only result would be a change in the spatial distribution of their landings and revenues. That is, small vessels would not be adversely impacted

by the moratorium (i.e. no loss of landings, revenues, or employment), though some effort would shift to state waters. This alternative set of assumptions yields some slightly different findings for the fishery overall than those provided above.

Specifically, for Preferred Alternative 10.B, under this different set of assumptions, the loss of landings and revenues to the harvesting sector would be 1.72 million pounds and $4.91 million, respectively. Similarly, effort would fall by 4,206 days. Approximately 464 days of effort would shift from federal to state waters. Further, since only the 45 large vessels would cease operations, the loss in jobs would only be 149. Fewer dealers would also be impacted (51). The average loss of sales to dealers is slightly more, ranging from 0% to 100%, with an average of 8%. Given the sales and employment multipliers noted above, the expected total losses in sales/output and employment would be approximately $17.58 million and 270 jobs respectively.

For Alternative 10.C, the loss of landings and revenues to the harvesting sector under the new set of assumptions is 1.22 million pounds and $3.37 million respectively. The reduction in effort is also greater at 3,798 days. Approximately 401 days of effort would shift from federal to state waters. The estimated number of lost jobs is 86. The number of adversely impacted dealers/wholesalers is slightly less (46). The range and average of losses in sales is 0% to 100% and 8.5% respectively, which is higher than under the first set of assumptions. Taking multiplier effects into account, the expected total losses in sales/output and employment would be approximately $12.1 million and 156 jobs respectively.

Finally, for Alternative 10.D, the loss of landings and revenues to the harvesting sector would be 6.29 million pounds and $19.89 million respectively, which is considerably more than the losses estimated under the first set of assumptions. Similarly, the decrease in effort is greater at 14,562 days. Approximately 316 days of effort would shift from federal to state waters. The estimated number of lost jobs in the harvesting sector is 554. The number of adversely impacted dealers/wholesalers is also greater (101). The loss of sales to dealers is the same as under the first set of assumptions (i.e. range of 0% to 100%, with an average loss of 8.6%). Taking multiplier effects into account, the expected total loss in sales/output and employment would be approximately $71.2 million and 1,003 jobs, respectively.

The primary conclusion of these findings is that, under the second set of assumptions wherein large non-qualifying vessels cease operations and small non-qualifying vessels shift all of their effort to state waters, the adverse economic impacts of Preferred Alternative 10.B, and Alternatives10.C and 10.D are greater, and considerably so for Alternative 10.D, than under the first set of assumptions. However, though the impacts under Alternative 10.D are still greater than under Preferred Alternative 10.B and Alternative 10.C, the difference in those impacts is much greater under the second set of assumptions. This result is due tot the predominance of large vessels within the group of non-qualifying vessels under Alternative 10.D relative to Preferred Alternative 10.B and Alternative 10.C. Furthermore, even though the shift of effort from federal to state waters is greatest under Preferred Alternative 10.B, the amount of effort shifting from federal to state waters under each of the alternatives is insignificant when compared to the total level of effort in the fishery (0.17% at most under Preferred Alternative 10.B).

It is important to note that the impacts under Preferred Alternative 10.B, as well as Alternatives 10.C and 10.D, will likely be partially mitigated by the fact that permits will be fully transferable under each of these alternatives. As previously discussed, it is not possible to predict with certainty how many owners of non-qualifying vessels will in fact purchase permits during the moratorium. However, existing evidence suggests that there would be 438 latent permits potentially for sale under Preferred Alternative 10.B, 486 under Alternative 10.C., and 466 under Alternative 10.D, where a "latent" permit is one held by a vessel that is not active in the fishery (EEZ or state waters). Given that the greatest number of vessels expected to need a permit in order to continue current operations is 187 (Alternative 10.D, assumption 1), the quantity of permits potentially available for sale should exceed the quantity demanded. This fact combined with the depressed economic condition of the fishery supports the plausibility of the previously noted $5,000 permit purchase price estimate.

Thus, under Preferred Alternative 10.B, at least 45 vessels and as many 72 vessels will likely need to buy a permit in order to continue current operations.[4] Therefore, the total cost of purchasing permits for these vessels' owners is expected to range between $225,000 and $360,000. Under Alternative 10.C., at least 26 vessels and as many as 47 vessels will likely need to buy a permit in order to continue current operations, and thus the total cost would range between $130,000 and $235,000. Finally, under Alternative 10.D., at least 168 vessels and as many as 187 vessels would need to buy a permit in order to continue current operations, resulting in a total cost of between $840,000 and $935,000.[5]

For the vast majority of vessels, it is undoubtedly the case that the cost of purchasing a permit would be less than the cost of shutting down operations, and would likely be their preferred option, *ceteris paribus*. However, it cannot simply be assumed that all vessel owners who need to buy permits will be able to do so, or do so at the estimated price. Many factors could preclude a vessel owner from purchasing a permit, particularly in the short-term. For example, qualifying permit holders that are true "speculators" may decide to hold on to their permits for several reasons, including a desire to wait and see the value other sellers are able to obtain for their permits, a desire to hold onto the permit until economic conditions improve which would in turn be expected to increase the value of their permits, or a desire to enter the fishery at some point in the future if economic conditions improve. Furthermore, although $5,000 may not constitute a large sum of money for some vessel owners, it is important to remember that: 1) this is an estimated average, and some buyers would be expected to pay more and 2) some owners may be willing to pay for a permit, but may not have the ability to pay. For less economically viable operations, $5,000 is a relatively greater burden compared to economically profitable operations. Given the negative economic returns on average in the fishery during recent years, some owners may not have the financial capital to purchase a permit. In the current economic climate, it is unlikely that financial institutions, which have already been impacted as a result of owners not being able to pay their boat mortgages, would be willing to loan such funds to struggling vessel owners. So, while

[4]It is assumed that vessels not active in the EEZ do not need to purchase permits in order to continue current operations.

[5]It is unlikely that the cost of purchasing permits would generate multiplier effects throughout the local and regional economies, and thus such effects are not considered in the analysis.

purchasing a permit may be a preferable option to most vessel owners, it may not be a viable option for some.

Nonetheless, in conclusion and regardless of which set of assumptions are used or whether a non-qualifying vessel shuts down or is able to purchase a permit, the results of the economic analysis of the alternatives indicate that, if the goal is to minimize short-term adverse impacts and/or the likelihood of such impacts on fishery participants while still achieving short-term and long-term objectives, and thereby achieve the greatest net economic benefit, Alternative 10.C is the option that attains this result. Preferred Alternative 10.B would generate slightly greater adverse economic impacts in the short-term. According to currently available information, Alternative 10.D. would generate the greatest, and possibly severe, adverse economic impacts in the short-term. So, the conclusion is that, after Alternative 10.C, Preferred Alternative 10.B would yield the next highest level of net economic benefits in the long-term, with Alternative 10.D yielding the least, though still more than the No Action alternative (Alternative 10.A).

The conclusions noted above must be somewhat qualified due to the uncertainty regarding vessels that may or may not renew or purchase their permits prior to the publication date of the final rule that will implement this amendment. Should all of the vessels that did not renew their permits in calendar year 2005 do so before the final rule's publication date or if new permits are purchased, then no previously permitted vessels would be excluded and thus there would be no known short-term, adverse economic impacts under Alternative 10.D. In that instance, Alternative 10.D would yield lower short-term, adverse economic impacts than Preferred Alternative 10.B and Alternative 10.C, and thus would be the alternative that minimizes such impacts and thereby generates the greatest net economic benefits in the long-term. However, it is also possible that none or only some of the vessels will renew their permits, particularly since most are likely large vessels that have been repossessed and are thus unlikely to renew their permits in the near future, if at all. Under this scenario, the majority of the estimated impacts would occur, which again would lead to the conclusion that Alternative 10.D would generate lower net economic benefits relative to Preferred Alternative 10.B and Alternative 10.C.

In addition, with respect to all of the estimated losses of landings and revenues under Preferred Alternative 10.B, and Alternatives 10.C and 10.D, whether or not they actually occur for the fishery as a whole is critically dependent on the point at which the fishery is operating on its yield curve. Based on the most recent stock assessments (Nance 2005), which estimate yield curves for each species rather than for the fishery as a whole, the fishery is operating at a level of effort that is sufficient or more than sufficient to harvest all of the available shrimp. That is, the fishery is operating at a point beyond the asymptote of the yield curve, implying that some reduction in effort would not yield a reduction in landings. Given that scenario, the estimated losses in landings and revenues would not occur for the fishery as a whole, though the vessels and likely the dealers would still be adversely affected (i.e. landings and revenues would simply be redistributed from the non-qualifying vessels and the dealers to whom they sell shrimp to the qualifying vessels and the dealers who purchase their shrimp, keeping in mind that some or all of the dealers in each group may or may not be the same). However, particularly for brown shrimp, the fishery is close to moving onto the downward sloping portion of the curve. Thus, whether due to the management

actions being considered within this amendment or other factors, further significant reductions in effort in the future will likely lead to reductions in landings and revenues for the fishery as a whole.

With respect to social and community level impacts, the focus shifts to how many vessels and dealers/wholesalers in each community will be affected, and the magnitude of those impacts with respect to losses in revenues, absolutely and relatively, and potential employment losses. In general, employment losses are dependent on how many of the vessels that supply shrimp to each community would be excluded under each alternative. Losses in revenue will indicate the relative distribution of expected income losses across communities. If those impacts are expected to take place in less resilient or more dependent communities, then their severity will be amplified. These impacts are illustrated in detail in Tables 6.8 through 6.10 under assumption 1 (i.e. regardless of vessel size, only losses from the EEZ are considered) and Tables 6.11 through 6.13 under assumption 2 (i.e. small vessels shift their effort into state waters and large vessels exit the fishery).

Specifically, under assumption 1, with respect to Preferred Alternative 10.B, the most significant social and economic impacts would be felt in Port Arthur, Abbeville, and Palacios, with impacts on Key West being of the next greatest significance. To illustrate, the number of impacted supplying vessels is greatest in Port Arthur and Key West, followed by Palacios.[6] Thus, these communities would face the greatest proportion of the employment losses noted in the economic analysis. Abbeville and Port Arthur would also have the greatest number of impacted dealer/wholesalers. With respect to revenue losses, in absolute terms, Port Arthur would be the most affected, followed by Abbeville and Palacios. In relative terms, the largest percentage losses in revenues, and thus likely income as well, would be seen in Grand Chenier, Crystal beach, and St. Petersburg. The range of revenue losses across these communities is from 0% to 11.8%, with an average per community of 2%. It should be kept in mind that Palacios falls within the group of communities that have been determined to be the least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts, and that Port Arthur and Abbeville fall within the group of communities that is the second least resilient in this respect. There are 34 communities impacted by this alternative to at least some degree. Given the impacts in Port Arthur, it is also possible that the sole processor in that community could be adversely impacted under this alternative.

Under Alternative 10.C, though social and economic impacts would be felt in 30 communities, which is slightly fewer than under Preferred Alternative 10.B, the impacts are similar for some communities but much less significant than under Preferred Alternative 10.B in many respects. For example, impacts are significantly lower under this alternative for Port Arthur, Key West, and to a lesser extent for Biloxi, Pascagoula, Freeport, and Port Bolivar. Impacts are basically the same or only slightly less for Abbeville, Palacios, Dulac, Grand Chenier, Tampa, and most other communities. As with Preferred Alternative 10.B, Abbeville, Port Arthur, and Palacios would experience the most adverse social and economic impacts, with Key West experiencing somewhat less significant impacts. In relative terms, Grand Chenier and Crystal Beach would face the greatest revenue loss in percentage terms, though the percentage losses for St. Petersburg and

[6]The number of impacted, supplying vessels is not additive across communities since vessels are migratory and supply more than one community.

Pascagoula are significantly lower than under Preferred Alternative 10.B. However, the losses in Port Arthur are still of a large enough magnitude to potentially impact the sole processor in that community. As noted in the discussion of Preferred Alternative 10.B, Palacios falls within the group of communities that have been determined to be the least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts, and Port Arthur and Abbeville fall within the group of communities that is the second least resilient in this respect.

Finally, under Alternative 10.D, the total number of impacted communities is 39, which is comparable to the number impacted under Preferred Alternative 10.B. However, these impacts are felt by a somewhat different set of communities and the magnitude of the impacts is much greater, absolutely but even more so relatively. In particular, the communities of Port Arthur, Palacios, Brownsville, and Abbeville would experience significant impacts, with somewhat less significant impacts being experienced in Bayou La Batre, Biloxi, Dulac, Galveston, Key West, and Port Bolivar. Impacts of slightly less significance would be felt in Bon Secour, Freeport, Ft. Myers Beach, Sabine Pass, and St. Petersburg. Specifically, Port Arthur, Palacios, Brownsville, Port Bolivar and Abbeville would see the greatest losses with respect to the number of impacted supplying vessels, and thus in employment as well, and the greatest absolute losses in revenue and thus income. Abbeville, Palacios, and Biloxi would also have the greatest number of impacted dealers/wholesalers. In terms of percentage losses in revenue and income, the greatest impacts would be felt in St. Petersburg, Pensacola, Galveston, Port Bolivar, Sabine Pass, and Port Arthur. Again, it is important to recall that Palacios and Bayou La Batre are in the least resilient group of communities, and Brownsville, Port Arthur, Abbeville, and Galveston are also considered communities that are particularly susceptible to adverse social and economic changes. Given the magnitude of the impacts in Port Arthur, Palacios, and Brownsville, it is also possible that the four processors in those three communities could be adversely impacted under this alternative.

As noted within the analysis of economic impacts, the analysis of social/community impacts above is based on the assumption that, for non-qualifying vessels, only their fishing activity from the EEZ component of the fishery is removed from the fishery and also that they continue their current level of operations in state waters (i.e. assumption 1). This is but one possible and plausible assumption. An equally if not more plausible assumption is that large vessels cease their operations while small vessels simply reallocate their effort entirely into state waters (assumption 2). Under this second set of assumptions, the results of the social and community impact analysis are somewhat different. In general, for each alternative, the impacts are more severe under this set of assumptions. Furthermore, for most individual communities, the impacts are also more significant. However, in a few communities, the impacts are slightly less under certain alternatives.

Specifically, under this second set of assumptions, and with respect to Preferred Alternative 10.B, the number of impacted communities is slightly less (32) than under the first assumption, with the communities of Crystal River, Ft. Myers Beach, Barataria, Bayou La Batre, Houma, Lafitte, and Matagorda no longer bearing any impacts, but with the communities of Boothville, Houma, Empire, Marrero, Ocean Springs, and Patterson being impacted. Further, the loss of supplying vessels is significantly less in Biloxi, Galveston, Dulac, Freeport, Golden Meadow, Key West, Port Arthur, and Tampa. The absolute loss in shrimp revenues is lower in Port Arthur,

significantly less in Dulac, Freeport, Key West, Pascagoula, Port Bolivar, and Tampa, but significantly greater in Abbeville, Biloxi, and St. Petersburg. In relative or percentage terms, the impacts are less in Pascagoula and significantly less in Freeport, Galveston, Key West, and Port Bolivar, but significantly higher in St. Petersburg, Abbeville, Marrero, Cameron, Ocean Springs, and Patterson. Abbeville and Port Arthur will bear the greatest impacts in absolute terms, though the impacts to Key West are less under this set of assumptions. It should still be kept in mind that Abbeville and Port Arthur fall within the group of communities that is the second least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts. Also, since Port Arthur still faces the greatest impacts in terms of absolute losses in revenues, it is likely that the sole processor in this community will still be impacted to some degree under this set of assumptions.

With respect to Alternative 10.C, the number of impacted communities is 33, which is slightly higher than under the first assumption. The major differences in impacts across the two assumptions under this alternative are somewhat similar to the differences under Preferred Alternative 10.B. For example, under assumption 2, impacts are much greater for Abbeveille, Dulac, and Venice in absolute terms, and significantly higher in relative terms for Marrero, Ocean Springs, and Patterson. Conversely, impacts are much less for Dulac in absolute and relative terms. Crystal River, Barataria, Houma, Lafitte, and Matagorda are not impacted under this assumption, while Boothville, Empire, Marrero, Ocean Springs, and Patterson are. The number of impacted supplying vessels is greatest in Abbeville and Palacios, while the number of affected dealers is greatest in Abbeville and Port Arthur. Again, Port Arthur and Abbeville fall within the group of communities that is the second least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts.

For Alternative 10.D, under this second set of assumptions relative to the first set of assumptions, the number of communities expected to be impacted increases from 39 to 44. More importantly, the impacts in many communities are expected to be more severe, in some instances considerably so. The primary exceptions to this general conclusion are St. Petersburg, which is not impacted at all, and Delcambre, where the impacts are significantly less. Impacts are significantly more adverse under this assumption for Abbeville, Bon Secour, Boothville, Golden Meadow, Grand Isle, Key West, Lafitte, Lockport, Port Arthur, and Venice. With respect to absolute losses in shrimp revenues and income, impacts are particularly severe for Port Arthur and Abbeville, but also very significant in Bayou La Batre, Biloxi, Brownsville, Galveston, Palacios, and Port Bolivar, and somewhat less significant in Bon Secour, Boothville, Dulac, Freeport, Ft. Myers Beach, Key West, Lake Charles, Lockport, and Sabine Pass. In relative terms, Pensacola, Lockport, Galveston, Port Bolivar, New Iberia, Abbeveille, and Sabine Pass will face the greatest impacts. In comparing the impacts across alternatives and assumptions, subject to the previously noted proviso, it is clearly the case that Alternative 10. D under assumption 2 would generate the greatest adverse social and economic impacts at the community level across the Gulf of Mexico, notwithstanding the previously mentioned caveat of vessels entering or re-entering prior to the publication of the final rule.

As noted in the economic analysis, the ability of the owners of non-qualifying vessels to purchase permits under the moratorium will likely mitigate the severity of the social and economic impacts

at the community level. From the perspective of community impacts, it is important to keep in mind that, the greater the geographic dispersion of vessel owners that need to purchase permits, the less will be the impacts in any single community which would arise from the costs of purchasing those permits. Thus, for example, under Preferred Alternative 10.B, assume that the owners of all non-qualifying vessels that were active in the EEZ need to buy a permit in order to continue current operations. Thus, 72 permits would need to be purchased. The data indicate that these vessel owners are dispersed across 45 different communities. Thus, on average, less than 2 owners per community would need to purchase a permit, implying that the average cost per community would be around $8,000, which is fairly minimal at the community level. The data also suggests that there are no high levels of owner concentration in any particular community. The largest number of vessel owners that need to buy permits are in Biloxi and Ocean Springs, at 4 permits each (or approximately a $20,000 cost for each of those communities). This is important because, if onshore businesses believe it is important to keep these vessels and vessel owners operating, then perhaps resources and information can be pooled (e.g. information regarding potential buyers and sellers) to ensure such an outcome, which would also tend to mitigate the significance of any impacts by further dispersing the costs across more businesses.

A similar result is seen under Alternative 10.C. Again, assuming all owners of non-qualifying vessels that operate in the EEZ need to buy a permit, then 42 permits must be purchased. These 42 vessel owners are widely dispersed across 33 communities, which means that, on average, slightly more than one permit must be purchased per community. Thus, the average cost per community would be between $6,000 and $7,000, which again is minimal at the community level and less than under Preferred Alternative 10.B.

Finally, the results under Alternative 10.D are rather different than under Preferred Alternative 10.B and Alternative 10.C. More permits need to be purchased under this alternative (187), if they do not do so prior to the publication of the final rule. Furthermore, the owners of these vessels are not quite as dispersed, as they are spread out across 73 different communities. Relatively high concentrations of owners needing to buy permits are particularly seen in Brownsville (20) and Port Arthur (17), with smaller concentrations in Freeport (8) and Palacios (7). Even though the average cost of purchasing permits per community would still be relatively low (slightly less than $13,000), the costs would be relatively higher in Brownsville and Port Arthur ($100,000 and $85,000, respectively). Again, it would likely benefit these communities if onshore businesses associated with the shrimp industry, such as the dealers and processors in these two communities, would pool their resources and information in order to ensure that these permits are purchased in the most expeditious manner possible.

An additional social impact should be considered in evaluating Preferred Alternative 10.B, and Alternatives 10.C and 10.D. Specifically, it is quite possible that many vessel owners who obtained their permits prior to the December 6, 2003, control date would strongly object to the choice of either Alternative 10.C or 10.D on equity/fairness grounds. That is, from their perspective, all shrimp vessel owners had ample notice and opportunity to obtain a permit prior to the published control date. Vessel owners that did not obtain their permits before that date did so of their own accord, and thus voluntarily assumed the risk accompanying that choice (i.e. the possibility of not being allowed to participate in the fishery in the future). The shrimp vessel

owners who obtained their permits by the control date may consider it "unfair" to allow those who did not into the fishery since the latter did not "play by the rules." That is, allowing the latter vessels into the fishery would reward "bad" behavior. On the other hand, based on experiences in other fisheries where moratoria have been implemented, there are always those who will claim that they did not in fact know of the control date, which is why they did not obtain their permit in a timely manner. The Council will need to evaluate and weight these competing claims.

Based on the above comparative analysis, as was the case under the economic assessment, the conclusion of the social impact assessment is that Alternative 10.C minimizes adverse social impacts in general, and specifically minimizes social and economic impacts at the community level. Preferred Alternative 10.B would be the next least onerous, with Alternative 10.D creating the most adverse social and economic impacts, unless vessels enter or reenter prior to the publication of the final rule.

As stated with respect to the economic impacts on harvesters and dealers/wholesalers, the conclusions regarding social impacts must be qualified by the uncertainty regarding vessels that may or may not renew or purchase their permits prior to the publication date of the final rule that will implement this amendment. Should all of the vessels that did not renew or obtain their permits in calendar year 2005 do so before the final rule's publication date, then no previously permitted vessels would be excluded and thus there would be no known short-term, adverse social impacts under Alternative 10.D. In that instance, Alternative 10.D would yield lower short-term, adverse social impacts than Alternative 10.C, and thus would be the alternative that minimizes such impacts. However, it is also possible that none or only some of the vessels will renew their permits, given that the majority are large vessels that have likely been repossessed. The current owners of these vessels are unlikely to renew their permits in the near future, if at all. Under this scenario, the majority of the estimated impacts would occur, which again would lead to the conclusion that Alternative 10.D would generate lower net social benefits relative to Preferred Alternative 10.B and Alternative 10.C.

Also as stated in the analysis of the economic impacts on harvesters and dealers/wholesalers, whether these social and community level impacts actually occur depends significantly on where the fishery is operating on its yield curve. That is, if the fishery is operating on the downward sloping portion of the yield curve, then the impacts are likely to occur. However, if it is still operating at or beyond the curve's asymptote, then these impacts are less likely to occur at the level of the fishery as a whole. Even in that case, it is still quite likely that landings and revenues will be redistributed between qualifying and non-qualifying vessels as well as the dealers/wholesalers and communities associated with those vessels. Thus, some if not most communities will be adversely impacted regardless of whether the fishery is operating on its yield curve.

Finally, it should be pointed out that, on average, the primary differences in revenues, dependency on shrimp revenues, and physical characteristics across the resulting fleets under each alternative are determined far more by vessel size and whether vessels are active in the fishery or not than by the choice of the permit moratorium alternative. This finding directly relates back to the conclusion that, regardless of which alternative is selected, with the possible exception of

Alternative 10.D, the fleet will not look that much different, and thus the path to recovery will also not be much different.

Action 11. Reporting of landings

> **Alternative 11.A: No action - Only those owners/operators of permitted commercial shrimp vessels that are selected by NMFS shall be required to report and certify the vessel's landings to the NMFS.**
>
> **Preferred Alternative 11.B: All owners/operators of permitted commercial shrimp vessels shall be required to report and certify the vessel's landings to the NMFS.**

Discussion and Rationale: Under Action 11, the Council is considering a change to the existing requirements for reporting catch. Current requirements (Alternative 11.A) are as follows: "The owner or operator of a vessel that fishes for shrimp in the Gulf EEZ or in adjoining state waters, or that lands shrimp in an adjoining state, must provide information for any fishing trip, as requested by the Southeast Fisheries Science Center Regional Director (SRD), including, but not limited to, vessel identification, gear, effort, amount of shrimp caught by species, shrimp condition (heads on/heads off), fishing areas and depths, and person to whom sold" (50 CFR § 622.5 [a] [iii]). Consequently, NMFS may select vessels that are required to report landings. Preferred Alternative 11.B would require that all permitted vessels report their landings, and not just selected vessels. By requiring that all vessels report landings, the Council would have a universe to stratify vessels' catches into different classes or categories. This would provide a basis for capping actual fishing effort or reducing it in the future, if further effort reduction is determined to be needed. If only a subset of vessels is required to report landings (Alternative 11.A), and the Council desires to reduce participation based on catch history; the Council would have to use some other means of determining levels of participation.

Biological Impacts: There would be no significant direct biological impacts from requiring all or some vessels to report landings because it would not affect fishing practices, gear, or effort. This action is merely an administrative one that would enable the Council and NMFS to guage participation based on landings for a given period of time. On the other hand, there may be minor indirect effects if fishermen believe that their landing history may be used in the future to in some way limit participation. Some fishermen may increase effort in order to increase landings with the possibility of negative impacts to bycatch species that may or may not be under management at the federal or state level. To what extent, if any, this may occur is unknown. Socioeconomic analyses do not indicate that effort increases are very likely until at least 2012 because there is an ongoing reduction in participants due to competition with imports and high operating costs. Additionally, the current level of participation is much lower than that of the late 1980s and early 1990s, and the establishment of a moratorium would cap participants at more current levels. Consequently, negative biological impacts are not expected, even if present participants increase their effort in the near future. On the other hand, if effort increases in the future to a point where it is determined to be a problem; it can be addressed via an additional action. However, any problems are not likely to be biological because overfishing has never occurred in any of the shrimp fisheries.

Socioeconomic Impacts: As discussed in detail within Section 5.4 of this amendment, the lack of appropriate trip ticket programs in Mississippi and Texas, in conjunction with current data management practices within NMFS, preclude determinations of which vessels are and are not active in the fishery, as well as the nature and level of that activity, with certainty. Since vessel owners would already have such information at their disposal and many would already be reporting it to various programs, the cost of providing and certifying the landings, at least during the moratorium and until programmatic changes can be instituted in the aforementioned data collection programs, should be minimal; possibly no more than the cost of a stamp and a piece of paper depending on how the information is to be provided. The information could be included as part of the vessel and gear characterization form or on the paper logbook without any significant increase in burden time, particularly since the time burden estimate for the paper logbook was based on a previously developed form that included such information. Should the Council begin to consider alternative long-term effort management programs under Amendment 14 and this information is still in question, poor decisions could be made that would create unnecessary hardship, particularly for permit holders that are actually participating in the fishery, or participating at a particular level, but current data sources do not reflect that participation. In such a scenario, economic and social costs could be extreme.

5.0 REGULATORY IMPACT REVIEW AND REGULATORY FLEXIBILITY ACT ANALYSIS

5.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: (1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; (2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and, (3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866 and provides some information that may be used in conducting an analysis of impacts on small business entities pursuant to the Regulatory Flexibility Act (RFA). This RIR analyzes the probable impacts that the alternatives in this plan amendment to the Shrimp FMP would have on the commercial shrimp industry.

5.2 Problems and Issues in the Fishery

The specific purpose and need for this proposed amendment are presented and discussed in Section 3 and are incorporated here by reference. Section 3 notes that the major issues identified for this plan amendment are: the consideration of a separate permit or endorsement for harvesting royal red shrimp; the establishment of needed status criteria and benchmarks for the managed shrimp species; methods to improve effort data and develop a standardized bycatch reporting methodology for the shrimp fishery of the Gulf of

Mexico; requiring completion of a vessel and gear characterization form; the implementation of a moratorium on the issuance of federal Gulf shrimp permits; and mandatory reporting of shrimp landings.

5.3 Objectives

Section 3 of this document discusses the specific need for this plan amendment and is incorporated here by reference. As noted the need for this amendment is in part based on the requirements of the M-SFCMA and 50 CFR 600.310 with regard to establishing definitions of MSY, OY, the overfishing threshold, and the overfished condition, as well as Section 303 (a) (11) of the M-SFCMA with regard to establishing a bycatch reporting methodology.

5.4 Description of the Fishery

A general description of the fishery is found in Section 6.0. However, this section presents additional detailed information considered to be important to a thorough understanding of the social and economic aspects of the fishery, and thus to the analysis of the management alternatives being considered in this amendment. Unless stated otherwise, the descriptive information presented in the sections below are with regard to conditions as they existed in 2002, since this is the most recent year for which complete data are available to generate the necessary information.

As with any commercial fishery, the Gulf of Mexico commercial shrimp fishery has three primary sectors: the harvesting sector (i.e. vessels), dealers/wholesalers, and processors.[7] The harvesting sector is the focus of the following description and analysis given that it is the sector most directly affected by management measures. However, that sector has multiple components as well. For example, and as reflected in the current management structure, a subset of vessels focuses some or most of its harvesting activities on royal red shrimp. Although royal red shrimp landings are a relatively minor component of the overall fishery, they are important to a small subset of vessels within the commercial fishery. In addition, though the shrimp fishery is dominated by the use of otter trawls, butterfly and skimmer nets are also important. In particular, skimmer nets have become increasingly important in Louisiana's inshore fishery, and their use is spreading in other inshore areas of the northern and eastern Gulf.[8] Finally, though most shrimp in the Gulf are harvested for consumptive purposes, a commercial bait shrimp fishery does exist. Texas likely accounts for the highest percentage of these landings. However, vessel and trip level data on bait shrimp landings are not currently collected in Texas and thus it is not possible to ascertain or account for their importance to individual vessels in the shrimp fishery. Bait shrimp landings also occur in Alabama and Mississippi. However, due to

[7]Some companies operate as both dealer/wholesalers and processors.

[8]Skimmer nets are illegal in Texas.

regulations in those states, vessels may only possess a food or a bait shrimp license at any given point in time and thus those landings are not considered in the following analyses. Conversely, vessels in Texas may harvest shrimp for both food and bait purposes if they possess the proper licenses, which need not be possessed only on an "either/or" basis in that state. Vessels on the Gulf coast of Florida may also harvest shrimp for either food or bait purposes, though no specific licenses are required to do so as in Texas. Florida's bait shrimp landings are accounted for in the following analyses.

Multiple databases exist by which to gauge participation and conditions in the Gulf shrimp fishery. Historically, NMFS' Gulf Shrimp Landings File (SLF) has been the primary source of landings data. The Vessel Operating Units File (VOUF) has been another source of information regarding the participation of vessels in the fishery. The weaknesses of these two data sources were previously outlined in Amendment 11 (GMFMC 2001). In general, the SLF provides an incomplete picture of vessel participation due to the practice of consolidating trips in such a manner that the landing vessel's identity is sometimes suppressed.[9] The VOUF's primary weakness is its reliance on the dockside observation of vessels and their gear for purposes of determining current participation in the fishery, though it is also hampered by the fact that it only tracks Coast Guard documented vessels (i.e. state registered boats are not taken into account). These weaknesses partly precipitated the desire for a federal permit, so as to better identify and characterize the universe of participants in the EEZ component of the fishery. However, since the permit is only required for vessels operating in federal waters, permit data cannot be used to assess participation throughout all waters of the Gulf of Mexico. The ability to assess such participation has been recently improved by the implementation of trip ticket programs in Louisiana and Alabama, and the required reporting of vessel identification numbers in Florida's trip ticket program. Data from those programs began to be directly incorporated into the SLF in 2002. Finally, possession of a permit does not necessitate actual participation in the fishery (i.e. some vessel permits may be "latent" as a result of an owner's temporary loss of a vessel, a decision to use the vessel in another fishery, or speculation). Therefore, a composite of all these data sources has been used to generate information regarding participation in the entire fishery, though the focus will be on federal Gulf shrimp permit holders and their activities.

5.4.1 The Gulf Shrimp Fishery

In 2002, at least 7,483 vessels (including Coast Guard documented vessels and state registered boats) were active in the commercial Gulf shrimp fishery. Of these 7,483 vessels, 5,086 have not possessed a federal Gulf shrimp permit between the time of the permit program's inception and when the permit data were most recently compiled (May 5, 2005). The other 2,397 active vessels are those that have possessed a valid permit at some point during this time period (i.e. of the 2,951 vessels that have been permitted, 554 were not active in the fishery).

[9] See Kazmierczak et al. (2003) for the potential analytical repercussions of this practice.

Total food shrimp landings and revenues were 145.24 million pounds (tails) and $376.19 million, respectively. Those landings and revenues can be broken down further into the following general categories: landings and revenues to permitted vessels, to non-permitted vessels, to large as opposed to small vessels,[10] and to unknown vessels. It is important to remember that "known" vessels includes all permitted vessels (active and inactive) and all active, non-permitted vessels. This breakdown and related statistics are presented in Tables 5.1 and 5.2.

Small vessels are more numerous than large vessels within the fishery as a whole and within the universe of non-permitted vessels. However, as would be expected, large vessels predominate the universe of permitted vessels. Large vessels also account for a much higher percentage of landings and revenues than their smaller counterparts within the fishery as a whole (i.e. they account for 78.6% of revenues to known vessels in the fishery), and even more so within the universe of permitted vessels. Conversely, because of their dominant numbers within the non-permitted universe (i.e. they outnumber large vessels nearly 20 to 1), small vessels account for a much higher percentage of landings and revenues within that particular group.

With respect to comparisons between the total and permitted universes, for large vessels, the data are very similar with respect to average landings and revenues. This finding is expected since it is difficult to imagine that many large vessels could survive economically without ever operating in the EEZ, and thus most would need a federal permit. This expectation is reflected by the relatively small level of food shrimp landings by large non-permitted vessels. Conversely, small permitted vessels attain much higher levels of food shrimp landings and revenues on average relative to all small vessels. This finding reflects the fact that small permitted vessels, who are more "serious" than their non-permitted small vessel counterparts (i.e. they spend more time operating in the Gulf food shrimp fishery), represent a much smaller percentage of the small vessel universe relative to the proportion that large permitted vessels represent within the large vessel universe.

A few more observations about the non-permitted vessels are worthy of noting before switching focus to the permitted vessels. Specifically, there is a much wider range of landings and revenues within that group than what would be expected, given the federal permit requirement in EEZ waters. Landings ranged from 4 pounds to over 152,000 pounds and revenues from $9 to nearly $384,000 in 2002. Breaking down the gross revenues for these vessels into reasonable groupings, of the 5,086 non-permitted vessels, the vast majority (3,364) grossed less than $10,000 in food shrimp revenues in 2002. Another 1,392 vessels had gross revenues between $10,000 and $50,000. And 256 vessels had gross revenues between $50,000 and $100,000. These revenue levels are to be expected for vessels that do not operate in EEZ waters and would thus not need to have a permit. However, 45 non-permitted vessels had revenues between $100,000 and $150,000, 22 vessels had revenues between $150,000 and $200,000, and another 7 vessels

[10] Large vessels are those greater than or equal to 60 feet in length, while small vessels are less than 60 feet.

exceeded $200,000. It is questionable whether these vessels, particularly the top 29 vessels, could achieve such levels of revenue generation without ever venturing into federal waters. This observation may deserve further exploration by the Council and NMFS.

5.4.2 The Gulf Shrimp EEZ Fishery

With respect to the universe of permitted vessels, from this point forward, it is assumed that the best way to characterize this group is to examine the nature and activities of all vessels that have held a federal Gulf shrimp permit up to the time the permit data were most recently compiled (May 5, 2005). Therefore, this is the group of vessels that will be assumed to represent status quo conditions in the EEZ component of the fishery (i.e the fleet that would exist/participate in the EEZ fishery if no action is taken regarding the permit moratorium).

A detailed statistical description of the status quo universe of EEZ permitted vessels is presented in Tables 5.3 through 5.11. The descriptive statistics examine the distribution of these vessels' revenues across different fisheries/species and thereby provide insight into these vessels' dependency on each fishery. For current purposes, the considered fisheries/species are grouped as follows: Gulf food shrimp, Gulf bait shrimp (west Florida only), South Atlantic shrimp (all components), Gulf non-shrimp, and South Atlantic non-shrimp. Dependency on the Gulf food shrimp fishery is considered most important for current purposes, as that component of the fishery is the focal point of management. Physical characteristics are also examined. The data on the distribution of vessels' revenues and their physical characteristics are broken down further according to vessel size category (i.e. "large" versus "small" vessels). The purpose of examining the data by vessel size is to gain a better understanding of fishery participants, their activities and behavior, and the roles they respectively play in the fishery as a whole.

With respect to statistics regarding the distribution of revenues for the permitted universe, the fact that the standard deviations are consistently close to or larger than the mean values indicates a high degree of heterogeneity within this group. That is, the amount of revenue earned within each fishery differs considerably between vessels. The lone exception is with respect to the percentage of their revenues which come from the Gulf food shrimp fishery. For the group as a whole, most rely on this fishery for nearly 79% of their revenues. Most vessels, though certainly not all, have a relatively high degree of dependency on the Gulf food shrimp fishery. With respect to physical characteristics, as opposed to landings and revenues, the fleet is much more homogeneous, though some differences do exist.

A primary source of this heterogeneity appears to be vessel size. As would be expected, small vessels generate lower levels of landings and revenues on average relative to their larger counterparts. On average, they are also "smaller" in regards to almost all of their physical attributes (e.g. they use smaller crews, fewer and smaller nets, have less engine horsepower and fuel capacity, etc.). Small vessels are also older on average, indicating the

trend towards the building and acquisition of larger vessels in the fishery during recent years. Larger vessels also tend to be steel-hulled. Fiberglass hulls are most prominent among small vessels, though steel and wood hulls are also common. Nearly two-thirds of large vessels have freezing capabilities while few small vessels have such equipment. Small vessels still rely on ice for refrigeration and storage, though more than one-third of large vessels also rely on ice. Some vessels are so small that they rely on live wells for storage.

Most interesting is the difference between large and small vessels with respect to their dependency on the food shrimp fishery. The percentage of revenues arising from food shrimp landings is nearly 87% for large vessels, but only slightly more than 61% for small vessels. Thus, on average, large vessels are more dependent than their smaller counterparts on the food shrimp fishery. Put alternatively, small vessels are more diverse and flexible than large vessels with respect to their operations, in general and across fisheries. This finding is consistent with those in Funk (1998). However, it is also the case that dependency on food shrimp is much more variable within the small vessel sector than the large vessel sector. That is, many small vessels are quite dependent on food shrimp landings, while many others illustrate little if any dependency.

To understand this difference, it is necessary to look at the distribution of active versus inactive (i.e. "latent") vessels in the Gulf shrimp fishery.[11] The data indicate that, of the 2,951 permitted vessels, 554 did not have any verifiable Gulf shrimp landings in 2002, while 2,397 vessels did. Large and small vessels comprised approximately 75% and 25% of the active group, respectively. However, small vessels represented a majority of the inactive group, nearly 53% compared to 47% for large vessels. In general, a vessel could be found to be latent for a variety of reasons, including permit speculation, participation in other fisheries at that time, and the vessel being sunk or otherwise inoperable. It is also possible that a vessel's landings were not identified because of the previously noted data recording and management issues. This fact is important to bear in mind because it is much more likely that a small vessel's landings would have been missed, due to the consolidation of landings and suppression of vessel identifiers in the SLF, than a large vessel, particularly if the former was in fact a state registered boat, and even more so if that boat were operating out of Texas and Mississippi, where trip ticket programs covering the food shrimp fishery are not in operation.

An examination of the geographic distribution of inactive vessel owners sheds some light onto this issue. Specifically, 32% of the inactive vessels' owners are from Texas, 29.4% are from Florida (including the east coast), 11.3% are from Louisiana, 10.7% are from Alabama, 7.4% are from Mississippi and the remaining 9.2% are from non-Gulf states. It is quite likely that many if not most of the alleged "latent" permitted vessels in Texas and Mississippi may in fact be active, but their landings cannot be specifically identified given current data collection practices. For the other areas, the likely explanation is a combination of permit speculation and the flexible operations of those vessels, particularly

[11]For present purposes, "active" is defined as having any identifiable landings in the Gulf food shrimp fishery or the west Florida bait shrimp fishery.

those that are small. However, this question can only be answered with certainty upon changes in current data collection practices (e.g. not consolidating landings of small vessels and suppressing their vessel identifiers in the SLF) and/or the implementation of trip ticket programs for the food shrimp fishery in Texas and Mississippi.

To illustrate the difference that inclusion or exclusion of the inactive permitted vessels has on vessels' dependency on the food shrimp fishery revenues, refer to Table 5.14. If inactive vessels are removed, for the permitted group as a whole, dependency increases from about 79% to nearly 97%. For large vessels, the increase is from about 87% to nearly 98%. Consistent with the above discussion, the change in dependency is most dramatic for the small vessels, which increases from about 61% to nearly 94% when the inactive vessels are removed from consideration.

5.4.3 The Royal Red Shrimp Fishery

Since separate actions are being considered for vessels that participate in the royal red shrimp fishery, which is considered a sub-component of the food shrimp fishery, data specific to those vessels are presented in Tables 5.33 and 5.34.[12] Given the distance from shore in which this fishery is prosecuted, not surprisingly, this group is dominated by large vessels, and thus they are a fairly homogeneous group with respect to their physical attributes. They are also fairly similar with respect to their total levels of revenue and their dependency on Gulf food shrimp landings.

However, with respect to their dependency on royal red shrimp landings, this group of 15 vessels can be split into three equally sized groups. Approximately 5 vessels could be considered "historical" participants in the fishery and are quite reliant on royal red shrimp landings (i.e. 40% or more of their revenues are consistently derived from such landings). Another 5 vessels could be considered somewhat dependent on royal red shrimp landings (i.e. 20% to 40% of their revenues come from royal red shrimp landings). These vessels tend to be more sporadic in their participation and have not been involved in the fishery for as long as the first group. Finally, the other 5 vessels are not highly dependent on royal red shrimp landings, which account for less than 20% of their known revenues. It is important to note that, with one exception in the latter group, whose landings are very low, all of these vessels possess federal Gulf shrimp permits, and thus would be covered by any requirements/rules imposed on those permit holders. With the one exception, their activities are also clearly identifiable in current data sources. With respect to this one non-permitted vessel, there is some question as to whether the species was correctly identified. Specifically, this vessel's alleged royal red shrimp landings came from a trip that occurred in Statistical Subarea 10 in only 1-5 fathoms of water. Given the known geographic and depth distribution of royal red shrimp, it seems highly unlikely that these were in fact royal reds. Thus, a conclusion that this vessel is an actual participant in the royal red shrimp fishery must be viewed with a fair amount of skepticism. Finally,

[12]Since it is a small group, and relatively homogeneous compared to the fishery as a whole, results are not disaggregated according to vessel size.

preliminary data from 2003 indicate that the number of participants in this fishery has not changed, and landings have actually decreased. Thus, it is still the case that the quota for this fishery of 392,000 pounds has still not been met since its imposition.

5.4.4 Historical and Current Economic Status of the Gulf Shrimp Fishery's Harvesting Sector

As has been noted in various publications and the media coverage, the Gulf shrimp fishery has been in economic decline for approximately the past three years. Travis and Griffin (2004) discuss this decline and its causes in detail, the highlights of which follow.

According to Funk (1998), which examined fleet profitability during the 1965 through 1995 time period, the average annual rate of return (net revenue or profit as a percentage of revenue) for the fishery as a whole was 12.5%, which is a respectable figure for capital investors. Given the inherent variability in shrimp stock conditions from year to year and, thus, landings and revenues, it is not surprising that profitability was also quite volatile from year to year, with the industry experiencing exceptionally high profits in some years and very low or negative profits (losses) in other years. In addition to the annual variability in abundance, economic performance appeared to be largely driven by changes in fuel prices, with changes in crew share expenses playing a secondary role. Several researchers have noted that fuel costs have and continue to represent a significant portion of the industry's operating costs (Haby et al. 2003; Ward et al. 1995). Thus, fluctuations in fuel prices can significantly impact the industry's economic performance.

In addition to variability over time, Funk's (1998) analysis also indicated that economic performance varied by vessel size. In general, rates of return tend to be higher on average for smaller vessels than for larger vessels, even though revenues and aggregate profits tend to be higher for the larger vessels. This result indicates that the costs of operating larger vessels also tend to be relatively higher, both in the aggregate and on a per unit basis, than those of smaller vessels. However, Funk (1998) hypothesized that ownership status and level of participation in the fishery were two of the most important factors explaining this variation in profitability. That is, smaller vessels tend to be predominantly operated by their owners, but only participate in the shrimp fishery on a part-time basis. These factors increase the flexibility of these vessels' operations. In general, these vessels will only participate in the fishery when revenue and/or profit per unit of effort is relatively high. When low or negative profits are being earned, these vessels and their owners will allocate their time to other fisheries and endeavors. Conversely, the larger vessels are more frequently operated by hired captains, and participate in the fishery on a full-time basis. In addition to the fact that these captains must be paid, as well as the crew, these vessels have much less flexibility with respect to when they participate in the fishery. Good captains must be retained, lest they be lost to other owners, and bills for relatively high "fixed"

costs, such as insurance, mortgage payments, etc., must still be paid regardless of whether the vessel fishes or not. Furthermore, many of these larger vessels are part of a vertically integrated operation (i.e. they are owned by processing firms). In such instances, the goal of the owner is likely to maximize profits for the entire operation as opposed to the individual vessel. A stable supply of shrimp is critical to the profitable operation of processing plants. All of these factors will cause these larger vessels to continue operating in the shrimp fishery, even when profits are low or negative. Therefore, on average and over time, a lower rate of return should be expected for larger vessels relative to smaller vessels in this fishery. Funk's (1998) results confirm this expectation. Nonetheless, overall, this industry was historically profitable during this time period.

According to a subsequent analysis, whose primary purpose was to analyze the impacts of the recent changes in TED regulations (NMFS 2002), the large vessel component of the fishery was profitable to highly profitable between 1998 and 2000. Nominal shrimp prices were relatively stable and fuel prices were relatively low by historical standards, and abundance tended to be higher than historical averages. Undoubtedly, strong conditions at the macroeconomic level created relatively high levels of consumer demand for shrimp, which in turn engendered strong economic performance in the shrimp industry.

However, economic conditions took an abrupt change in the latter half of 2001. Current evidence indicates that as imports surged, macroeconomic conditions deteriorated, and when the post September 11, 2001, era began, the industry was hit by sharply declining prices and higher insurance premiums.[13] At least for the large vessel sector, profits turned into losses by the end of 2001. The deteriorating trend appears to have continued through 2002 and 2003, exacerbated by increases in fuel prices that began in the latter part of 2002 and continued through 2003. According to average price data reported by the Bureau of Labor Statistics (BLS), from 2002 to 2003, fuel prices increased between 21% and 29%, depending on the selected fuel price index.[14] Regardless of which index used, fuel prices increased significantly which, in turn, significantly increased shrimp vessels' operating costs.

By 2002, as indicated in the economic analysis of the 2003 Texas Closure policy (Travis and Griffin, 2003) and the supplemental economic analysis of Amendment 10 to the Shrimp Fishery Management Plan (NMFS 2003), economic conditions deteriorated to the point where all sectors of the Gulf shrimp fishery, regardless of vessel size, state, or gear, were facing negative profits (losses), on average, by the end of 2002. According to the Texas Closure analysis, for the fishery as a whole in 2002, the average rate of return (profits or losses as a percentage of revenue) was expected to be approximately -41%, with lower loss rates being experienced for the small vessel sector (-30%) relative to the large

[13]Increases in vessel insurance premiums are documented in a Commercial Fisheries News article, a reprint of which can be found at http://www.fishresearch.org/Articles/2002/10/insurance.asp.

[14]According to information posted to http://data.bls.gov on February 17, 2004, the Consumer Price Index's average price data for fuel oil, Series APU00007251, indicates that fuel prices increased by 21% between 2002 and 2003. However, the PPI's data on average prices for #2 diesel fuel, Series WPU057303, indicates that fuel prices increased by 29% during this time.

vessel sector (-45%). Regardless of whether the Texas Closure policy was continued or not, projections for 2003 indicated that these economic losses would persist under current conditions.

The analyses clearly indicate that rapidly declining prices have been the primary source of the recent deterioration in the industry's economic condition. In the aggregate, the average nominal price of shrimp in the Gulf decreased by approximately 28% between 2000 and 2002. Revenues decreased even more as a result of relatively lower shrimp abundance and, therefore, landings in 2001 and 2002 relative to 2000. The magnitude of the price decline has varied by shrimp size category, with the under 15 count ("jumbo") and 68 and over count ("small") size categories seeing the smallest declines (approximately 23%) and the 31-40 and 41-50 count ("large" and "medium") size categories seeing the largest declines (approximately 35%). Due to inflation, these price declines are even larger in real terms. According to Haby et al. (2003), increases in shrimp imports have been the primary cause of the recent decline in U.S. shrimp prices. A complete discussion of the factors contributing to the increase in imports can be found in Haby et al. (2003). In general, recent surges in imports have been caused by increases in the production of foreign, farm-raised shrimp. More specifically, increased competition from shrimp imports has been due to three primary factors: 1) changes in product form due to relatively lower wages in the exporting countries, 2) shifts in production to larger count sizes, and 3) tariff and exchange rate conditions which have been favorable to shrimp imports into the U.S. With respect to the first factor, lower wage rates have allowed major shrimp exporters (e.g. Thailand) to increase production of more convenient and higher value product forms, such as hand-peeled raw and cooked shrimp. With respect to the second factor, changes in farming technology and species have allowed production of foreign product to shift towards larger, more valuable sizes. As a result of these factors, imports are more directly competing with the product traditionally harvested by the domestic industry, thereby reducing the latter's historical comparative advantage with respect to these product forms and sizes. Finally, with respect to the third factor, the lack of duties on shrimp imports into the U.S., the presence of relatively significant duties on shrimp imports into the European Union (E.U.), and the recent strength of the U.S. dollar relative to foreign currencies have created favorable conditions for countries exporting products to the U.S.

As Haby et. al.(2003) note, the increase in imports has caused the domestic industry's share of the U.S. shrimp market to decrease from 44.6% to 14.8% between 1980 and 2001. While the growth in imports was relatively steady throughout most of this time period (for e.g., 4% to 5% in the late 1990's), shrimp imports surged by 16% in 2001. Since 2001, which is the last year accounted for in their analysis, shrimp imports have continued to rise. Although the increase in 2002 was a modest 7.2%, relative to the increase in 2001, a significant increase of 17.5% occurred in 2003 according to the most recently available data.[15] Undoubtedly, these increases have led to further erosion in the domestic industry's market share and additional price declines.

[15]Shrimp import data can be found at http://www.st.nmfs.gov/st1/trade/trade_prdct_cntry.html Statistics cited in this report were based on data posted as of March 25, 2004.

The economic analysis of the 2003 Texas Closure was recently re-examined and updated to further investigate changes to the industry's current economic status. This analysis revealed that, on average, vessels were not even able to cover their variable costs in 2002. Preliminary information indicates that prices have continued to decline in 2003,[16] which would lead to the expectation that the vessels' inability to cover their variable costs has continued in 2003. If vessels cannot cover their variable costs, they will be forced to cease operations (i.e. exit the fishery), at least until conditions change.

Projections of fleet size, as measured by full-time equivalent vessels (FTEVs), and nominal effort were updated and extended farther into the future (20 years, or through 2021) to determine how long it would take for the fishery to reach an equilibrium state, assuming no changes in external factors (e.g. imports, regulations, etc.). In general, equilibrium occurs once economic losses are no longer being incurred (i.e. economic profits are zero) and fleet size is stable (i.e. fleet size has reached its minimum level).

According to the new projections, the average rate of return in the fishery for 2002 is projected to have been approximately -33%, slightly better than initial projections, and the difference between the rates of return in the small vessel sector and large vessel sector also narrowed to a small degree (-27% and -36%, respectively). Economic losses are forecast to continue throughout the fishery on average until 2012, *ceteris paribus*. As would be expected, these losses cause vessels to continue exiting from the fishery during this time. The size of the large vessel sector and level of associated fishing activity decline continuously, in terms of FTEVs and nominal effort, through 2012 and are expected to have decreased by 39% and 34%, respectively, relative to 2002 levels. However, only the large vessel sector reaches an equilibrium by 2012. Although the number of FTEVs and nominal effort are expected to decrease in the small vessel sector by approximately 29% by 2012, the small vessel sector continues to decrease in size and effort throughout the entire twenty-year simulation. The logic behind this differential result between the large and small vessel sectors is fairly straightforward. Specifically, as large vessels, which predominately operate in offshore waters, exit the fishery, their departure leads to an improvement in the economic performance of the large vessels that remain in the fishery, primarily as a result of increases in CPUE in offshore waters. However, given the migration pattern of shrimp from inshore to offshore waters, the departure of large vessels does not generally increase CPUE in inshore waters where the smaller vessels tend to operate. Conversely, the departure of small vessels improves the economic performance of both small and large vessels by removing competition in inshore waters and by allowing more shrimp to escape into offshore waters (i.e., CPUE should increase in both inshore and offshore waters). Although the economic performance of large vessels is expected to improve more quickly than that of small vessels, *ceteris paribus*, it must be emphasized that, under current conditions, economic recovery even in the large vessel sector is not expected for several years.

[16]Currently available data for 2003 indicates that the decline in nominal prices from 2000 is 36% across all size categories. Depending on the size category, the declines range from 27% to 40%.

It is important to note that these projections assumed that external factors such as imports, fuel prices, and other costs remain unchanged from their 2002 status. That is, recent information regarding increases in fuel prices, insurance premiums, and imports, and further declines in shrimp prices during 2003 were not incorporated into the model and analysis since final data are not yet available. Since these changes would be expected to further erode the harvesting sector's economic performance, the projections of economic losses, decreases in fleet size and effort, and the period of time before the large vessel sector stabilizes are likely underestimated. Thus, unless other factors change in a manner that would contravene these adverse impacts, these projections should be considered conservative. Such contravening factors would include those which could be reasonably expected to increase prices. Such factors could include improvements in product quality and successful marketing programs that promote domestic, wild food shrimp, both of which would be expected to increase its demand. Tariffs and other import restrictions (e.g. more stringent standards on the presence of antibiotics in farmed shrimp) could also lead to price increases.

5.4.5 Gulf Shrimp Dealer/Wholesaler Sector

In addition to the harvesting sector, dealers/wholesalers play an important role in the Gulf shrimp industry. Unfortunately, no studies have been done to specifically examine their current economic performance. However, given the documented declines in the harvesting sector and the processing sector, and also given the fact that many dealers are also harvesters or processors, it is logical to conclude that this sector is also experiencing adverse economic conditions for the same reasons.

This sector is characterized in Table 5.12 . In 2002, 626 dealers were identified in the SLF data. Note that this figure is considerably higher than in previous, recent years. For example, between 1999 and 2001, this figure was in the 310 to 320 range. Such a dramatic increase is inconsistent with the hypothesis that this sector was also experiencing harsh economic conditions. However, the answer to this apparent mystery lies primarily in certain harvesters' responses to the poor economic conditions.[17] Specifically, in their attempts to reduce costs and obtain higher prices for their product, it appears that many harvesters decided to remove one of the so-called "middlemen" by obtaining dealer licenses themselves in order to sell directly to the public. An in-depth examination of the data appears to support this conclusion.

Specifically, and as is suggested by the statistics, there is considerable heterogeneity within this sector with respect to individual dealers' volume and sales. The data indicate that, of the 623 dealers reporting sales figures, 63.4% (395) reported food shrimp sales of less than $100,000. Of these, over 70% reported sales of less than $10,000. It is highly likely that the vast majority of these dealers are in fact harvesters who decided to obtain a dealer license and sell their own product rather than sell through a traditional dealer/wholesaler. When you factor out these dealers, that leaves 228 dealers who sold more than $100,000 of

[17] Improved identification of dealers also plays a role, though it appears not a significant one.

food shrimp. This figure is closer to what would be expected given numbers from previous years and prevailing economic conditions. These firms are likely the traditional dealers that have dockside businesses/facilities. Of these 228 dealers, 139 had food shrimp sales volumes between $100,000 and $1.0 million, while the remaining 89 had sales exceeding $1.0 million. Many of these 89 dealers are also processing firms. Three firms had sales exceeding $10.0 million.

5.4.6 Gulf Shrimp Processing Sector

With respect to the processing sector, descriptive statistics regarding employment, overall volume and sales, and food shrimp volume and sales is presented in Table 5.13. As with the harvesting and dealer sectors, there is considerable heterogeneity within the processing sector regarding employment, volume, and sales. The data indicate that 21 processors had less than $1.0 million in food shrimp production, 22 had between $1.0 and $5.0 million, 9 had between $5.0 and $10.0 million, 11 had between $10.0 and $20.0 million, and the remaining 11 exceeded $20.0 million.

However, the data also indicates that a majority of these firms are highly dependent on the processing of food shrimp. Unfortunately, with current data, it is not possible to determine with certainty how much of the shrimp being processed is domestic as opposed to imported. However, by cross-referencing multiple data sources, Keithly et al. (2005) attempted to approximate this figure.[18] According to their findings, use of imports by domestic processors increased steadily through the 1980's and for example, in 1986, accounted for about one-third of production. Between 1992 and 1994, which was apparently the peak period, domestic and imported product accounted for nearly equal proportions of total processed shrimp products in the Southeast region. Even though, as noted previously, imports have continued to increase since then, Southeast shrimp processing activities have not increased proportionately as a result.

Keithly et al. (2005) hypothesized that this outcome is a direct result of a significant and steady decrease in the deflated price of processed shrimp from over $7.00/pound in the early 1980's to less than $4.00/pound in recent years. This decline has also precipitated a decline in processors' marketing margins (i.e. per unit profitability). As a result of the declining margins, some processors have adjusted by increasing output in order to compensate; but many have been unable to make such an adjustment, and thus have been forced to exit the industry. This is illustrated by the fact that the number of Gulf shrimp processors has fallen from 124 to 72 between 1980 and 2001. Thus, the situation illustrates the classic case of an industry in economic decline, wherein the number of firms falls, and those who remain become larger in size (as measured by output). That is, the industry has become more concentrated. Moreover, Keithly et al. (2005) concluded that, if production of farm-raised shrimp continues to increase and a substantial portion of that production enters the U.S. market, the price of processed shrimp will continue to decline; margins will

[18]The one weakness with their approach is the assumption that all domestic production is utilized by the processing sector. While in normal economic times, this assumption would be plausible, it is less reasonable in dire economic times when harvesters shift from traditional sales channels and instead sell directly to the public.

continue to narrow; and consolidation will continue to occur as additional firms exit and remaining firms attempt to compensate by increasing their output.

5.5 Impacts of Management Measures

A summary of the economic impacts of management measures being considered are discussed following each of the actions in Section 4.0 above. This section presents a more detailed analysis of those impacts.

5.5.1 Action 1: Consideration of requiring a royal red shrimp vessel permit or an endorsement to the commercial shrimp vessel permit for vessels harvesting royal red shrimp in the Gulf EEZ

The requirement of an additional permit or an endorsement to the existing shrimp vessel permit could produce some adverse economic impacts if: (1) there is a separate permit application; and (2) there are additional costs for the additional permit or endorsement. If the separate royal red shrimp permit can be obtained at the same time and with the same application process as is in place for the shrimp vessel permit, which is the current expectation, there would be little additional burden on vessel owners or operators. The same would be true for a separate endorsement. Given that all of the current fishery participants possess federal shrimp permits, the additional cost would be $20 per applicant. This cost per applicant would be the same regardless of whether the requirement is for an additional permit or endorsement to the current shrimp permit. The only other costs would be in the additional time required to complete the application, which is minimal since it would only require checking off an additional box on the form.

The additional cost of $20 per application form could be seen as unduly burdensome since all of the participants already pay $50 for the Gulf shrimp permit. Some fishermen may also participate in the South Atlantic rock shrimp or penaeid shrimp fisheries and thus, given the impending permit requirement in the latter, they would have to pay for all of these permits. Given that these vessels are all large and thus likely migratory, this situation is somewhat likely. Some fishermen resent having to pay for permits at all, and that resentment is greater under the current economic climate, and possibly even greater yet for these particular fishermen given the additional gear expenses they must incur to participate in this fishery.

Based on their experience, the SERO Permits Office has advised that, when considering a separate permit as opposed to an endorsement, a separate permit requirement is less confusing to most permit applicants since many are unfamiliar with the term "endorsement" and its exact meaning (R. Sadler, personal communication). Thus, the "aggravation" burden to both the applicants and NMFS would be less with the additional permit requirement as opposed to the endorsement. If the endorsement alternative is selected and fishermen are confused by this term and its meaning, that would heighten their frustration with the permit application process.

Since 14 vessels are known to be engaging in the fishery at this time, the resulting out of pocket cost would be $280. More vessel owners could apply for the permit or endorsement than those who currently participate, which would increase the total cost for the industry as a whole. It is not possible to predict with any certainty how many "speculators" might apply for the permit. Consequently, though Alternative 1.A would impose no costs, the adverse economic impacts from either Alternative 1.B or Preferred Alternative 1.C would be small and approximately the same. These costs would be imposed on a small number of vessel owners. However, in the current economic climate, even relatively small increases in costs could be considered an unwelcome burden from the perspective of fishery participants. Further, it is important to keep in mind that participants in this fishery must obtain additional equipment beyond that required to participate in the penaeid fishery. Specifically, a more powerful hydraulic wench system and additional cable are required, primarily due to the greater water depths being trawled. According to industry participants, these additional costs can range from $50,000 to $70,000 per vessel, which would be difficult for vessel owners to absorb in the current economic climate. Additionally, royal red shrimp do not freeze well when compared to penaeid shrimp, which limits its market. Historically, the penaeid shrimp species (brown, white and pink) have enjoyed higher market prices and a broader market than royal red shrimp, and they are caught nearer to shore. On the other hand, royal red shrimp are typically caught at depths of approximately 200 fathoms. Since this fishery is prosecuted in greater water depths farther from shore, longer trips are required which leads to greater "sunk" fuel expenses, and thus greater financial risk if trips are unsuccessful in terms of landings. In general, there are many reasons not to expect an expansion of this fishery in the short-term.

With respect to benefits, they would appear to be minimal as well, though dependent on the Council's choices under Action 8. Specifically, since the current fishery participants all possess federal shrimp permits, information collected on that form is already in hand. Further, these vessels' activities can already be examined from existing data sources. The lone exception to this statement is with respect to effort data. However, should the Council select alternatives under Action 8 that would appreciably increase and improve effort data for the EEZ fishery, these vessels would be covered under such programs. That conclusion would be assured if the Council selects alternatives that apply to all permitted vessels as opposed to only a sample of vessels. Even if the Council was to select alternatives where only a sample of the permitted fleet was required to provide effort data, the royal red shrimp fishery could be treated as a stratum within the sampling design if such information is deemed as being important. The same would be true for any economic and social data collection programs. Therefore, it is difficult to conclude that there are any benefits from an additional permit or endorsement requirement for royal red shrimp fishery participants with respect to additional or improved information.

In the future, if the quota of 392,000 pounds was increased, economic conditions in the fishery improved and/or the costs of participating in the royal red shrimp fishery were to decrease, and vessels could potentially specialize solely on royal red shrimp landings without any reliance on penaeid shrimp landings from the EEZ, then the benefits from such an additional permit would be higher since the need for information specific to their

activities would be greater. On the other hand, in discussions with some of the fishery participants (Travis, 2004), there would be some support for a separate permit requirement if there was evidence that the stock was in trouble and/or participation and effort increased in a short period of time. That is, current participants would want to protect the resource and the economic health of the fishery if it were necessary.

Furthermore, there is another important link between the alternatives being considered under this Action and Action 10. Specifically, given that the Council has decided to impose a moratorium under Action 10, then the selection of Preferred Alternative 1.C would limit participation in the royal red shrimp fishery to vessels that qualify for moratorium permits. Conversely, the selection of Alternative 1.B would allow any vessel to obtain a royal red shrimp permit. Given the economic status of the royal red shrimp fishery, which likely mirrors the adverse economic conditions of the Gulf shrimp fishery as a whole, allowing additional vessels from other fisheries and regions to enter the fishery would cause the catch and revenues from the fishery to be shared among a larger number of participant which, given the existence of the 392,000 pound hard quota in the fishery, would potentially decrease the share to each existing participant. Such an outcome would worsen economic conditions in the fishery and would thus be inconsistent with the Council's desire to stabilize and improve the economic performance of vessels in all components of the Gulf shrimp fishery. Thus, it is highly likely that Preferred Alternative 1.C will lead to positive net benefits in both the short-run and the long-run.

5.5.2 Action 2: MSY Alternatives for Royal Red Shrimp

The choice of the lowest or highest estimate of MSY, as is the case with Alternatives 2.C or Preferred Alternative 2.B, respectively, would only impose economic costs if the current fishery were to expand. As noted in Table 1, landings have never exceeded the lower alternative for MSY. However, if the fishery were to expand either from additional effort by vessels that are in the fishery or from new entrants, economic impacts would ensue. First, if Alternative 2.C is the proposed alternative, and landings were to exceed the 392,000- pound quota, the Council or NMFS could take action to limit or reduce landings. At the least, they would be required to shut down the fishery once the quota was exceeded. If experience in other fisheries can be used as an indicator, once vessel participation and effort reaches the point where the quota is likely to be reached before the season's end, derby fishing conditions are likely to occur, which are known to adversely impact all fishery participants via market gluts and the resulting price decreases. Further, if the expansion was due to the establishment of new or expanded markets, such action would negatively impact the production, buying, distribution, and consumer sectors. Under Preferred Alternative 2.A or particularly Alternative 2.B, negative economic impacts are potentially less because they may allow harvests to levels nearly two times the highest recorded catch in a given season. Additionally, there would likely be positive economic impacts if the fishery were to expand through the development of new or expanded markets and the generation of new or increased income for producers and sellers while providing additional product to consumers. However, this result is completely dependent on whether the Council or NMFS increases the quota to match the change in MSY. That is, these

economic benefits could only be created if, in a separate action either now or in the future, the Council or NMFS was to increase the quota above its current 392,000-pound level. Such an action is not presently considered within this amendment, and thus the hypothesized economic benefits would only potentially occur in the future. In any case, for reasons previously cited (i.e. costs of entry, limited markets, current adverse economic climate, etc.), it is unlikely that this fishery will expand in the near future, which likely renders both the discussed costs and benefits moot.

In general, MSY specifications do not directly affect resource use. Therefore, regardless of which alternatives are selected, they would have no direct effects on existing fisheries. Direct effects associated with resource use would only accrue as a result of a subsequent management action in response to an evaluation of the fishery with regard to these benchmarks. With no direct change in the use of the resource by harvesters, there would be no behavioral changes by these individuals and businesses and, therefore, no indirect affects attributed to such change in general. These definitions are statutory requirements of an FMP, and their establishment would provide public satisfaction by recognizing that the Council is effectively managing the resource.

5.5.3 Action 3: OY Alternatives for Royal Red Shrimp

As with the MSY alternatives discussed above, the choice of the most conservative alternative (Alternative 3.C with a 392,000-pound OY) or the least conservative alternatives (Alternative 3.A or Preferred Alternative 3.B) would only cause adverse economic impacts if the current fishery were to expand in terms of vessel participation or level of effort. Given the current economic climate within the Gulf shrimp fishery and the additional costs and risks associated with participating in the royal red shrimp fishery, such an expansion is unlikely which, at least in the short-term, renders discussion of economic costs and benefits from this action moot.

5.5.4 Action 4: Overfishing Definition for Royal Red Shrimp

As with biological impacts, establishing a definition of the overfishing threshold based on any of the alternatives would not immediately result in any economic impacts because overfishing would not be declared at this time. Consequently, there would not be a need to reduce harvests that would impose economic costs. If the fishery were to expand, capping landings and their associated F values at the lowest MSY value (392,000 pounds) as could occur with Alternatives 4.A or 4.B, impacts could occur in two ways. First, if the expansion in landings results from increased effort by existing participants only, their earnings potential would be capped. However, because of the low number of participants in the royal red shrimp fishery, this cap would likely result in lesser impacts than if the expansion occurred as a result of new entrants. In this case, the lowest level of potential landings (392,000 pounds) would be shared by more participants resulting in more severe economic impacts, particularly if derby fishing conditions were to occur. With a higher MSY, under Alternatives 4.B or 4.D, the impacts under either scenario would be potentially lessened, depending on future Council actions regarding the quota. If the

declaration of overfishing did not occur until the higher F_{MSY} (Preferred Alternative 4.C) is exceeded for two consecutive years, the likelihood of an overfishing declaration and subsequent management measures to reduce F would be reduced further. However, at the present time, there would be no adverse economic impacts from any of the alternatives.

5.5.5 Action 5: Overfished Definition for Royal Red Shrimp

As with biological impacts, establishing a definition of the overfished condition based on any of the alternatives would not immediately result in any economic impacts. Consequently, there would not be a need to reduce harvests that would result in adverse economic impacts. If the fishery were to expand and F was not checked to the point that the stock became overfished, economic impacts would occur. Alternatives 5.B and 5.C would allow biomass to be reduced to 50% of B_{MSY}, which is the lowest level allowed by the M-SFCMA. Alternative 5.C would allow this level of reduction to occur for a 2-year period, and thus it would be the most risk-prone alternative. However, both alternatives assume that the chosen level of MSY is correct, which may not be the case, and that F is the factor that has driven the stock to such levels. Preferred Alternative 5.D would also be risk-prone, if B and B_{MSY} could be accurately calculated, which is doubtful at the present time. Alternative 5.A would not be approvable under the M-SFCMA and Guidelines for National Standard 1and is included for NEPA evaluation only. Potential economic impacts from the stock being declared overfished would probably follow the same two paths discussed above for a declaration of overfishing. The only difference would be that a rebuilding plan would have to be developed, and reduced harvest levels might be required for a slightly longer period of time, thereby prolonging such negative economic impacts. Since royal red shrimp are not considered a long-lived species, with a maximum age at about 5 years (Anderson and Lindner 1971), impacts from rebuilding would likely not be prolonged. However, since there are only approximately 14 active vessels in the fishery and several are highly dependent on royal red shrimp landings, any significant reduction in allowable catch could result in an economic collapse of the fishery. At the present time, however, there would be no adverse economic impacts from any of the alternatives.

5.5.6 Action 6: MSY Alternatives for Penaeid Shrimp

There would be no economic impacts from any of the MSY alternatives because penaeid shrimp harvests are primarily dictated by external environmental and economic conditions. Environmental conditions control the availability of shrimp. In combination with economic conditions, both affect the level of effort and thus the actual harvest of shrimp. Because there are no management restrictions that directly restrict the amount of shrimp harvested, though catches may be reduced as a result of losses from BRDs and TEDs, as well as from an assortment of time and area closures throughout the Gulf, fishermen can generally exert as much effort as they desire in catching the available supply in any given year. Additionally, because the consumption of shrimp far exceeds the available domestic harvest, market price appears to be influenced by imports to a far greater extent than the available domestic supply, though seasonal fluctuations still exist. On the other hand, a

larger supply of fresh local shrimp could increase profits to local fishermen and other levels of the industry (e.g. dealers and processors that rely on domestic shrimp).

5.5.7 Action 7: OY Alternatives for Penaeid Shrimp

Since they are identical, the economic impacts of the OY alternatives would be the same as for the MSY alternatives in Action 6 presented above.

5.5.8 Action 8: Alternatives to Establish Bycatch Reporting Methodologies and Improve Collection of Shrimping Effort Data in the EEZ

Prior to discussing the potential economic costs of the various alternatives under this action, some discussion of their potential benefits is necessary. For several years, the issue of how to accurately measure effort in the shrimp fishery has been a subject of debate, not only between the industry, the Council, and NMFS, but also between an assortment of academic researchers. Effort data is currently collected by NMFS' port samplers via opportunistic interviews with vessel captains.

Going back at least to 1993, the Council convened a shrimp effort committee to analyze potential deficiencies in the shrimp effort data and the methods used to collect it (GMFMC, 1994). The committee provided a long list of recommendations regarding issues that needed to be addressed and the means to address them, particularly with respect to changes in data collection techniques that would minimize potential bias due to the lack of randomness. Some of those recommendations have been followed, at least to some extent, such as implementation of a permit requirement and a Gulf-wide trip ticket system, while most others have not. While the committee recognized that implementing a more random effort data collection program would not be easy, their conclusion was that the benefits would outweigh the costs, particularly given the important management issues directly and indirectly involving the fishery at that time; issues that are still discussed today, such as levels of finfish bycatch, turtle interactions, and overcapacity. Further, while trip tickets may be an efficient means to collect landings and sales data, given that they are dealer reporting systems, they may not be a very efficient or accurate means to collect information about fishing activity that occurs out at sea. Dealers do not directly observe such activities; fishermen do.

Concerns regarding the randomness of port sampler effort interview data were again expressed in Griffin et al. (1997). This research was primarily concerned with the lack of interview coverage for inshore trips, particularly those taken by state registered boats. Their conclusion was that, while NMFS' estimates of days fished (effort) was fairly accurate for the offshore component of the fishery, its estimate of inshore effort was biased, and thus effort estimates for the fishery as a whole were also biased. In addition to recommending that the interviews of inshore trips be increased, they also set forth an alternative model for estimating effort in the fishery. In their view, their alternative model

would be more sensitive to annual changes in effort and thus would be more likely to capture those changes.[19]

Travis (2000) also addressed the issue of potential bias in the effort interview data and questioned certain aspects of the NMFS' method of estimating effort. One recommendation from that paper was to examine the possibility of implementing logbooks to ensure that effort data was in fact representative of the fishery. Most recently, Griffin (2004) re-examined the NMFS' model and the alternative model of Griffin et al. (1997) for estimating effort using data through 2002. His conclusion was that, not only has the bias in the effort data become more serious, but the sources of the bias have expanded as well (i.e. the data are even less representative of the fishery than in the past). Specifically, the data are not representative across vessel size (small vessels are almost completely ignored in the interview data), states (interviews of Texas and Alabama vessels' trips far exceed their proportion of trips in the fishery), area fished (inshore effort interviews are practically non-existent), and gear (though skimmer nets have increased in importance, their coverage in effort interviews has declined). Part of the problem lies not just in the randomness of the effort interviews, but in the sheer lack of number. As a result, he concluded that neither the NMFS nor the Griffin et al. (1997) methods may be suitable for estimating effort in the fishery. Further, for the first year since the models have been compared, the NMFS and Griffin et al. (1997) methods yielded effort estimates that moved in different directions in the same year (i.e. in 2002, the former showed effort increasing from 2001 while the latter indicated the opposite), which is a serious concern from both a scientific and a management perspective.

Haby et al. (2002) specifically took issue with the spatial accuracy of the effort interview data. That is, in practice, it is common for interviews to lump all effort into one particular statistical subarea and depth zone even when, in fact, the effort was distributed across multiple statistical subareas and depth zones. While this type of bias may not affect estimates of total effort in the fishery, it certainly affects estimates of its spatial distribution. In a fishery that is faced with a multitude of historical and relatively new time and area closures, such biases could seriously distort estimates of the economic and social impacts of proposed closures, and thereby lead to poor management decisions that unnecessarily burden the industry and/or do not solve the problem they are intended to address. Gallaway et al. (2003a) advanced similar concerns, but with a specific focus on NMFS' estimates of bycatch, particularly that of juvenile red snapper and turtles. This research appeared to indicate that, indeed, there are important biases with respect to the spatial nature of NMFS' effort estimates and thus potentially its estimates of bycatch. Their proposed solution was to implement a simple electronic logbook program in the fishery, possibly in combination with paper logbooks.

Bycatch information is currently available from various past studies and incorporates both fishery-dependent and fishery-independent data. Because of the aforementioned problems, the only practical way of improving the estimates of the amount and type of

[19]One potential drawback to their method is that it relies heavily on vessels and boats being completely and accurately identified in the landings data, a problem which has already been discussed in this Amendment.

bycatch is by having a more precise means of estimating effort than is currently used by NMFS port samplers. Some means of randomly sampling a representative portion of the fishing effort throughout the shrimping season and geographic distribution of the shrimp fishery to gather data on the amount and type of bycatch is also needed. The improved estimate of effort could then be used to extrapolate the sample estimate of bycatch to develop a total estimate of the amount and type of bycatch.

As an additional benefit, improved effort information could also be used to improve estimates of interactions with turtles and estimates of capacity, overcapacity, and excess capacity. Additional certainty regarding these measures should lead to less controversy in the management process and thus to quicker, easier, and more long-lasting, if not permanent, solutions. If that result could be attained, the costs of management would be reduced, and thus the burden on taxpayers as well. If fishery regulations were stable for a longer period of time, that would constitute an important benefit to an industry that is already beset by various sources of instability and the resulting economic uncertainty. Any management or similar governmental actions that might be enacted to enhance shrimp vessel operations as a result of this more accurate information would be shared by all participants in the shrimp fishery. However, fisheries other than the shrimp fishery would benefit from better management of bycatch species, and this would enhance the benefits to users of these other fishery resources, including non-consumptive users.

With respect to economic costs, a shrimp logbook form was developed for the Summer 1998 Gulf Red Snapper/Shrimp Research Program. This form could serve as a template for a new logbook program in the Gulf shrimp fishery. That form basically mimics the list of data elements contained in Alternative 8.A. The form was intended to be completed on a daily basis. According to the Paperwork Reduction Act clearance package for that data collection program, it was anticipated that shrimp fishermen would need 10 minutes to complete each daily logbook form.

Regarding the 2,951 federally permitted vessels, information on trip length was available for 684 of these vessels (23.2% of the fleet) on at least one or more of their trips in 2002. These data indicated that, on average, trip length was approximately 15 days. The data also indicated that this group of permitted vessels took a total of 35,850 trips during 2002. Therefore, the total number of days at sea for this group of vessels is estimated to be 537,750, which yields an average of 182 days at sea per vessel. Further, the average annual time burden per vessel would be approximately 30.33 hours, or slightly more than 89,503 hours for the fleet under Option 2 (i.e. paper logbooks are required for all permitted vessels).

From an economic perspective, even though there is no direct cash expense from a paper logbook program, there is an opportunity cost associated with any time burden created by additional reporting requirements. Typically, opportunity cost is approximated using the average wage or salary of the affected persons. Since vessel owners/captains would be responsible for submitting the logbook forms, it would be most appropriate to use the average wage of first line supervisors/managers in the fishing, forestry, and farming

industries. As of May 2003, which is the most currently available information, the BLS reported that the mean wage of persons in this occupation group was $18.14.

Therefore, the average annual opportunity cost per vessel of the paper logbook reporting requirement would be approximately $550.19 ($18.14/hour * 30.33 hours). For the fishery as a whole, the average annual opportunity cost would be approximately $1,623,611 ($550.19/vessel * 2,951 vessels) under Option 2. If only a sample of vessels is selected to report, as would be the case under Preferred Option 3, then the burden estimate would be proportionally less and dependent on the chosen sampling rate. For example, if 20% of the vessels were required to submit paper logbooks (i.e. approximately 590 vessels), then the annual opportunity cost for the fishery would be approximately $324,612. However, given the Council's preferred alternative under Action 10, the potential paper logbook reporting requirement would only apply to the 2,666 vessels that qualify under that alternative. Thus, the opportunity cost of this program would be $1,466,807 for the permitted fleet or $293,521 for a 20% sample under the proposed moratorium.

Although these costs are not direct out of pocket cash expenses, they would constitute a significant burden on an already economically disadvantaged industry, particularly under Option 2. Though not presently under consideration, this burden would be exacerbated by asking shrimp fishermen to record detailed information regarding the various types of bycatch in their nets. In order to ensure accurate recording of such data, all vessel captains would have to be trained on how to properly identify all the species that may show up in their nets. Given the plethora of species that shrimp fishermen encounter, the training itself would seem to be an onerous task with respect to time and education requirements, both for the industry and the NMFS personnel who would have to conduct the training and develop the new forms. Furthermore, the actual time to record such information on a paper logbook form would undoubtedly be much greater than the estimate of 10 minutes for a more simple form that only requires the information specified in Option 2, and could be reasonably foreseen as a serious impediment to conducting successful shrimping operations. The fact that many shrimp vessels operate at night would exacerbate the difficulty and the burden of accurately recording such information. Under such a burden, given that the vessel captain/owner would have to fill out the form or risk forfeiture of his permit, it is likely that he would not take the necessary care to provide accurate information. In such a scenario, a burden to the fishermen would be created, but the expected benefit of additional, accurate bycatch data would not be achieved (i.e. net benefits would be negative). According to a recent analysis of logbook and observer data in the Hawaii longline fishery (Walsh 2000), the accuracy of logbook data is particularly questionable when fishermen are asked to report catch data for species that are economically undesirable and/or caught in large quantities, which would apply to much of the shrimpers' bycatch. Typically, such catch is under-reported in the logbook data. Note that this occurs even when an observer is on board when the logbook is being filled out. Fishermen also encountered serious problems when attempting to identify species with which they had little familiarity and when the appearance of multiple species was very similar. Thus, it would seem reasonable to conclude that there are other means to collect bycatch data in a less burdensome manner

that would also ensure greater accuracy of the data, and the Council should continue to not consider this as a viable option.

Another method that can be used to collect effort data is ELBs. Option 2 under Alternative 8.B (electronic logbooks) could remove most of the burden associated with the collection of effort data by paper logbooks. Preferred Option 3 under Alternative 8.B would be even less burdensome in that only a sample of vessel permit holders would be required to participate in an electronic logbook program. Gallaway et. al. (2003b) utilized an electronic logbook that combined a GPS with a recording of trawling speed to determine when, where, and for how long a vessel was fishing. This device was removable following each trip and allowed the data to be downloaded into a computer for analysis. Such a system could greatly reduce the burden of effort reporting on fishermen while improving the database on effort. Other types of electronic logbooks have also been used in other fisheries. The major impact for the choice of electronic logbooks would come from who pays for them and their cost. The version used by Gallaway et. al. (2003b) cost approximately $500.

At this time, it is assumed that NMFS and not the industry would absorb the cost of purchasing these units. If NMFS purchased these units for all the permitted vessels (Option 2), the total cost would be approximately $1,404,500. Again, however, given the Council's preferred alternative under Action 10, ELBs would only be placed on the 2,666 qualifying vessels and thus the total cost would be $1,333,000. Though it is a direct cash expense, it is slightly lower than the opportunity cost to the industry of a paper logbook program. Furthermore, if only a sample of vessels were required to allow placement of electronic logbooks on their vessels, this would reduce the cost to the government proportionally according to the selected sample size. For example, if only 20% of the currently permitted fleet were required to use ELBs, then the cost to the government (and thus to taxpayers) would be around $295,000. The cost would be $266,500 given the Council's preferred alternative under Action 10. From a time burden perspective, since the fishermen would not be required to record any information, but rather only send in or otherwise provide the unit on a regular basis for data downloading purposes, ELBs would be far less burdensome to the industry relative to paper logbooks.
Additional costs would be imposed on the government as a result of managing either a paper logbook program or an ELB program. Though these costs are not imposed on the industry, they are costs to the public since taxpayers will ultimately have to foot the bill for such programs. Under Alternative 8.A, Option 2, the cost of implementing a paper logbook program that would cover all permitted vessels is estimated to be $906,680. If only a sample of these vessels are required to report, as under Preferred Option 3, the estimated cost is reduced to $194,136. Given the reduction in paperwork, it is logical to conclude that the costs of collecting, maintaining, and compiling data from the ELBs would be less than those of a paper logbook program. In fact, the estimated cost of such a program under Alternative 8.B, Option 2, is $210,100. If only a sample is selected, as under Preferred Option 3, then the cost is reduced to $94,380.

As indicated in Alternative 8.C, observers are another means to collect effort and particularly bycatch data. Option 2 under Alternative 8.C would utilize the existing observer program which has a limited sampling program and relies on voluntary participation. As noted in the discussion of effort interview data, such approaches can easily lead to the collection of insufficient and biased/non-representative data. Assuming sufficient finding, Preferred Option 3 could offer a more random and broader sampling of the type and amount of bycatch. To ensure cooperation, any vessel that refused to participate could lose their permit to fish if they did not participate.

The use of observers in a fully functional program (Preferred Option 3) would provide better information on individual catches and trips than the existing program (Option 2) because such data would be collected from a larger number of actual commercial shrimping operations. However, it is not practicable to fund enough trips to preclude the need for extrapolation using the existing effort data or improved effort data from some type of logbook program (Alternatives 8.A or 8.B). Given previous information on the number of days at sea by currently permitted vessels, and an estimated cost of $1,000 per day for an observer, the total cost of a program that covered all vessels would be nearly $538 million, an extremely onerous amount. Even given the slightly smaller permitted fleet resulting from the Council's preferred alternative under Action 10, the cost would be $485.2 million, which is still extremely onerous. With a sampling rate of only 5%, which is a common standard in other observer programs, the cost of the program would still be about $27 million (slightly less, at $24 million, given the Council's preferred alternative under Action 10). At this time, it is assumed that the industry would not be asked to cover any of these costs. Even so, this would be a significant cost to NMFS and thus to taxpayers. So, at least with respect to effort data, paper or electronic logbooks appear to be the more efficient options, whether they are imposed on all permitted vessels or only a sample. However, that still leaves the issue of bycatch composition data (i.e. type and amount) unresolved. Given the need for highly knowledgeable and motivated individuals to record the information in order to ensure accuracy, and a desire to minimize adverse impacts on the industry, observers appear to be the only reasonable choice. For example, perhaps a lower sampling rate of 1% would be sufficient to generate the necessary information regarding bycatch composition, as long as randomness could still be guaranteed. Such a sampling rate would at least reduce program costs to a more manageable estimate of $5.4 million, or $4.85 million under the Council's preferred alternative under Action 10).

Even if the coverage and funding issues can be resolved, there are other economic and related impacts to be considered. Specifically, having an observer on-board generates liability concerns for vessel owners. Given the high costs of insurance and, according to anecdotal information, the lack of insurance coverage within the fleet, this alone could pose a significant cost to the industry. This problem would not exist if observers came with their own insurance, though it is not clear if this solution is feasible. Additionally, some observer programs have seen fishermen change their fishing behavior in response to the presence of an observer on their vessel, particularly when the imposition of the program was clearly not desired by the industry and it played no role in its creation or implementation. If the observer is perceived as a spy that cannot be trusted to protect

confidential information, or even a nuisance in terms of interfering with the vessel's normal on-board operations, a vessel captain may decide to cut his trip short in order to minimize the observer's time on board. Another burden comes in the form of space on board the vessel. Observers would have to be quartered in some fashion, and many shrimp boats do not have available space. That is, in order to carry an observer, they would have to take one less crewman. In the current economic climate, available data suggest that many vessels have already cut back on their crews, and cutting back further may not be feasible if the vessel is to continue operating. For smaller vessels who have less flexibility with regard to accommodating additional persons on board due to simple lack of space, some sort of exemption status may need to be granted in such instances. This is a clear concern given the number of permitted vessels that are less than 60 feet long (approximately 732 vessels given the Council's preferred alternative under Action 10).

5.5.9 Action 9: Alternatives for Completion of a Gulf Shrimp Vessel and Gear Characterization Form

The purpose of the vessel and gear characterization form is to give analysts the ability to more thoroughly describe the Gulf shrimp fishery with respect to vessels and their gear and thereby gain a better understanding of their operations. Such information can be used to develop an assortment of biological, social, and economic models that will assist in the evaluation of alternative management measures in the future. If the information is collected at the census level (i.e. for all permitted vessels), then the information can be used in developing appropriate sampling designs for other data collection programs, such as paper or electronic logbooks, observers, social and economic surveys, etc. When data collection programs can be designed in a manner that allows greater stratification, the accuracy and precision of statistical estimates arising from that data will be enhanced, and thus will be more representative of the fishery which will in turn give those estimates more credibility in both a scientific sense and presumably within the industry. For example, in combination with more accurate effort data, information regarding the nature of BRDs and TEDs and their actual levels of use should allow NMFS' analysts to better document their performance and effects on shrimp and other fishery resources.

The vessel and gear characterization form could be sent along with the permit application form, and could be returned at the same time, thereby minimizing any expense associated with mailing of the form. The only cost associated with the form would be the time burden associated with its completion, which is estimated to be approximately 30 minutes in its current form. However, depending on the exact nature and coverage of the data to be potentially collected within the alternative programs being considered under Action 8, some questions may not be necessary and could be removed, thereby reducing the time burden by as much as 10 minutes. Using the previously discussed methodology for estimating the opportunity cost of time burdens, the form would create an annual opportunity cost of between $4 and $9 per vessel, and between approximately $10,600 and just over $24,000 for the entire permitted fishery. Given the Council's preferred option under Alternative 8.A, all questions on the example form would need to be asked and thus the higher burden estimate is likely more accurate. Although collecting this information

from only a sample of permitted vessel owners would impose this cost on fewer vessels and decrease the burden on the fishery, its usefulness would be significantly reduced. In order for the information to be used as a means to develop sampling designs for other programs, the information needs to be collected for the entire fleet. Similarly, should the form be voluntary, issues of response rate, response bias, and thus representativeness of the information would severely hamper the data's usefulness. In general, the only alternative that would generate positive net benefits is Preferred Alternative 9.B. Otherwise, the next best option is to not implement the form and stay with the status quo, Alternative 9.A.

5.5.10 Action 10: Alternatives to establish a commercial shrimp vessel permit moratorium

There is a need to temporarily address the issue of participation in the fishery until a long-term effort management program can be developed and implemented. Participants in the shrimp fishery are experiencing economic hardship primarily related to depressed prices and high fuel costs. Particularly as a result of the significantly reduced prices, the value of the shrimp resource in the Gulf has decreased. As a result, the fishery cannot support as many participants as it has historically. Anecdotal evidence indicates that many vessels, particularly larger vessels, have gone into bankruptcy and been subsequently repossessed, which in turn has caused significant disruption with respect to business relationships within the various sectors of the industry. Under the assumption that external factors such as imports, fuel prices, and other costs remain unchanged from their 2002 status, economic projections currently predict a decrease in effort as a result of the continuing exit of vessels through the year 2012. Thus, economic disruptions in the industry are expected to continue for some time.

The Council may consider long-term effort management programs in the future. However, the immediate problem is the potential for new vessels to enter the fishery by obtaining federal permits, which could reduce the benefits of a long-term effort management program in general and particularly to current participants, if such a program is needed. Under the current economic conditions, the vast majority of new entry would likely be purely speculative. Increases in the number of active participants in the fishery would not be sustainable under the current economic conditions. However, the global market is unpredictable and the potential exists for external factors to improve long-term market conditions (i.e. shrimp and fuel prices). Even with improved economic conditions, any increased active participation in the fishery would cause the already reduced size of the "economic pie" to be shared with more vessels/people, thereby leaving smaller pieces of that pie for current participants and slowing down the industry's economic recovery.

Furthermore, current fishery participants have been exerting considerable effort to improve their economic condition through a variety of approaches, including attempts to improve product quality via a product certification program and several aggressive marketing campaigns. Should those efforts be successful, the demand and thus the prices for domestic, wild shrimp would increase. The same result may occur if industry participants are successful in their attempts to have tariffs imposed on farmed, foreign shrimp, which

they assert have been "dumped" into the U.S. market. The point is that, from their perspective, since they have been the ones to go through the hardships and expend the resources in an attempt to reverse the industry's economic fortunes, then, under any reasonable concept of what is equitable, they should be the ones to benefit from their efforts. In economic parlance, what would be prevented is the possibility of "free-rider" behavior. "Free-rider" behavior occurs when one group of people allow others to bear all the costs of a particular action, but then later partakes in some of the benefits. Such behavior is considered not only "unfair," but is also inefficient if encouraged because it will eventually create a perverse incentive system wherein all individuals would eventually engage in such behavior and the desirable actions would not occur. In effect, the permit moratorium is one means to dissuade such behavior.

At present, since the shrimp permit is an open access permit and thus can be obtained by anyone, assuming the proper paperwork and fee are submitted, permits are not currently transferable. However, current fishery participants should be aware that the Council established a control date of December 6, 2003. The establishment of the control date was a signal to fishermen that, should they desire to continue to participate in the fishery, they needed to obtain a permit by that date or face the possibility that they would not be allowed to participate should the Council decide to implement a limited entry or other form of effort management program in the future. Furthermore, many are also aware that a permit moratorium is an action currently being considered within this amendment, and that multiple alternatives are also being considered under that action; alternatives that will have different implications for their livelihoods depending on when and whether they have already obtained a permit.

However, the combination of the control date and the non-transferability of current permits has created a problematic situation for many current Gulf shrimp vessel owners, and those who desire to become owners of current Gulf shrimp vessels. In general, these two groups of individuals are caught in a business decision paradox. Many vessel owners apparently have a desire to sell their vessels, which is to be expected under the current economic conditions. While the demand for such vessels may not be considerable, anecdotal information suggests that such demand exists nonetheless. Since permits are not transferable with the sale of the vessel under the current system, a new owner must obtain a new permit. While that is allowable, the new permit would be assigned an effective date associated with the time of the new owner's application, not the date of the original owner's permit. Therefore, although the original owner's permit may have been dated prior to the control date, at this time, a new owner's permit would have an effective date beyond the control date. At present and until the Council acts, it is uncertain whether the new owner would be given a permit under a potential moratorium. If the previous vessel owner did not have a vessel permit, or at least not one dated prior to the control date, then the potential new owner's future in the fishery is even more uncertain. Prudent businessmen understand that purchasing a vessel under such circumstances would be financially risky and thus they are hesitant to engage in such transactions. For current vessel owners, the situation prevents them from selling an asset that they no longer wish to own. Therefore, they must continue to operate their vessels or tie them up. In either case, they are likely to continue losing money since certain expenses, such as boat payments,

insurance, mooring fees, etc, must be paid regardless of whether their vessels are active or not. In short, the current system is preventing potential buyers and sellers from engaging in transactions from which they would both benefit (i.e. efficient exchanges), and creating considerable business uncertainty for current and new vessel owners.

So, in sum, the moratorium should help to address both a long-term problem and a short-term problem. The short-term problem is the box that existing and potential new shrimp vessel owners are in as a result of: 1) the control date being established; 2) that date is already past; 3) current permits are not transferable with their vessels; and 4) the effective date on any new permits would be past the announced control date. Allowing the permits to become transferable would eliminate or at least significantly reduce the existing economic uncertainty in the market and thereby encourage efficient business exchanges.

In the long-term, the problem has two components. First, for an assortment of reasons, additional vessel owners may decide to obtain a permit for speculative purposes. Should they become active in the fishery, their participation would add to the industry's existing economic woes. Further, the inclusion of additional vessels would complicate the creation of a long-term effort management program, dissipate the benefits from such a program, and redistribute those benefits from current to new fishery participants. Such a result could be seen as both inequitable and inefficient if allowed to occur. By capping participation to current participants, the moratorium would avoid such a result.

Since the permits would be transferable, all but the No Action alternative (Alternative 10.A), considerable additional discussion of that issue is not warranted. However, it should be noted that, since the permits will be transferable under Preferred Alternative 10.B, and Alternatives 10.C and 10.D, even if some vessel owners are not granted a moratorium permit, they will still have the opportunity to purchase a permit from individuals who are willing to sell. At this time, since the market for permits does not yet exist, it is impossible to predict with accuracy what the price of such a permit will be once a market does exist. As with all traded commodities, permit price will be a function of demand and supply conditions at the time of the desired purchase. Under normal conditions, a permit's price will typically reflect the expected stream of profit for a particular period of time, with that period of time depending on how long the holder intends to keep it. That is, this expected stream of profit will determine the price at which the buyer is willing to sell. The shorter the time period and the lower the expected stream of future profit, the lower will be the price. Thus, at least in the short-term, under current economic conditions, potential buyers should be able to purchase permits fairly cheaply. Conversely, permit owners who want to sell, of which there may be many, should not expect their permits to command a high price in the short-term. However, if and when the fishery recovers, those permits will increase in value. That increased value partially represents the previously discussed accrual of benefits to current permit holders.

Given the lack of an existing market for Gulf shrimp permits, in theory, it is possible that information regarding the purchase price of other transferable permits may provide some insights into the potential prices of Gulf shrimp permits once they become transferable (i.e.

other permit prices might serve as a viable proxy). Several permits in commercial fisheries of the Southeast Region are presently transferable, including king mackerel, Gulf reef fish, Gulf red snapper, South Atlantic snapper-grouper, South Atlantic rock shrimp, swordfish, and shark. However, none of these fisheries circumstances are closely comparable to those of the Gulf shrimp fishery within the EEZ. Specifically, with the potential exception of the South Atlantic rock shrimp fishery, none of these fisheries have recently experienced the same precipitous decline in economic performance as has been seen in the Gulf shrimp fishery. Further, in general, the Gulf shrimp fishery is a much larger fishery in terms of vessel numbers and, with the exception of the South Atlantic rock shrimp fishery, is generally composed of larger, more powerful vessels relative to these other fisheries that tend to earn much higher levels of annual gross revenues. Although the South Atlantic rock shrimp fishery may be the most comparable in certain respects, it is a much smaller fishery with respect to the number of permitted vessels (approximately 145), and thus the number of permits available for sale at any point in time will be much smaller. The more scarce a commodity, the greater will be its selling price, *ceteris paribus*. Thus, in theory, Gulf shrimp permit prices should be less than South Atlantic rock shrimp permit prices, at least in the short-term.

Current information on South Atlantic rock shrimp permit prices indicates that they have been selling for approximately $10,000 on average since the permits became transferable two years ago.[20] Given the reasons noted above, Gulf shrimp permits should sell for less than $10,000 on average in the short-term. In reviewing all transferable permit purchase prices from November 2004 through May 2005 within the Southeast Region, the average is approximately $5,000. At this time, this value is the best estimate of the likely price of Gulf shrimp permits in the short-term, and thus will be used in subsequent analyses.

Although specific permit prices cannot be forecast with much certainty under Preferred Alternative 10.B, or Alternatives 10.C or 10.D at this time, it is likely that the price of permits will be slightly greater under Alternative 10.D than under Preferred Alternative 10.B, which in turn may be slightly greater than under Alternative 10.C (i.e. permit price may be lowest under Alternative 10.C). This conclusion is based on the likely number of permits that will be demanded relative to the number that will be available/supplied. Since Alternative 10.D will exclude the greatest number of vessels, thereby likely generating the greatest demand for permits and, in turn, yield the fewest number of permits (i.e. the lowest number available/supplied), it is logical to conclude that permit price will be greatest under Alternative 10.D, unless there was an influx renewal or speculative permits, which is highly unlikely. Conversely, Alternative 10.C excludes the fewest vessels and permits the greatest number of vessels, which should lead to a lower permit price. However, as discussed later, this conclusion must be qualified by the possibility that, of the vessels that did not have permits in calendar year 2005, through the month of May, and which are assumed to not qualify for a moratorium permit under Alternative 10.D, some or all of those vessels may obtain or renew their permits prior to the publication date of the final rule that will implement this amendment. Should all of those vessels renew their permits or

[20]This average excludes several values of $1 and $10, as these are likely not reflective of actual market values, but rather indicate transfers between individuals with close personal and/or business relationships.

if others obtain permits prior to that date, then Alternative 10.D would yield the lowest demand, the greatest supply, and therefore the lowest permit price since none of the known 2,951 vessels that have had permits would be excluded, and there are potentially new permits. At this time, it is not possible to determine how many of those vessels will actually renew before the final rule's publication or how many new permits might be issued.

As between the alternatives, the previous discussion should be sufficient to conclude that the net economic benefits of the No action (Alternative 10.A) are clearly negative. Regarding the other three alternatives, the most economically desirable option is the one that achieves the desired outcomes or objectives at the least cost to the industry and society in general. As already noted, permit transferability is a component of each alternative, and this action will solve the short-term problem. Therefore, the question is which of the alternatives will solve the long-term problem. The answer is, all of them. The basis for this statement lies both in theory and in some recent analyses of this general issue.

In general, though with the possible exception of Alternative 10. D, the differences between the three alternatives are relatively minor with respect to the number of vessels that will be allowed to participate in the fishery under the moratorium, and with respect to the amount of effort that will be potentially removed, at least relative to the total number of vessels and total effort level in the fishery. In other words, the differences between the alternatives are not sufficiently significant to put the fishery on substantially different recovery paths. This point is illustrated both in the analysis of the fishery's current economic status and future projections within Travis and Griffin (2004). That is, based on this analysis, it can be deduced that significant changes in fishery participation and effort, shrimp prices, and/or operating costs would be required to substantially hasten the fishery's recovery. This point is more directly made in the analysis of a permit moratorium within NMFS (2004). Although that analysis is not geared to the specific alternatives being considered in this amendment, it illustrates the most critical point. That is, future economic projections are not substantially different across permit moratorium options or other effort management measures unless the changes in effort or changes in shrimp prices are significant (e.g. at least on the order of a 20% change).[21] This result is not surprising since, in general, all economic impacts dissipate over an extended period of time.

Therefore, since Preferred Alternative 10.B, and Alternatives 10.C, and 10.D, could be reasonably expected to put the fishery on the same path and help solve the previously indicated long-term problem, the choice of the best alternative from an economic perspective depends on their relative short-term, adverse economic impacts with respect to how many and which vessels would be initially prevented from participating in the fishery, at least until they could purchase a permit from a qualifying vessel. Before discussing the details of those short-term, adverse economic impacts, some assumptions need to be clearly specified in addition to those that have been previously stated.

[21]That analysis did not examine the potential changes in recovery paths as the result of potentially lower costs, such as fuel and insurance.

First, since the exact time frame associated with Alternative 10.D cannot be known at this time, given that the date of the final rule's publication cannot be perfectly foreseen, it is assumed that those vessels that had a permit with an effective date during calendar year 2005, through the date the permit data were compiled (May 5, 2005), would be eligible for a moratorium permit.

Second, given that these vessels could still participate in the state waters component of the fishery without a permit, it was desirable to determine how many of the potentially affected vessels actually participate in the EEZ fishery and the level of that participation, as measured by shrimp landings and revenues. This is not a straightforward proposition since, with the exception of data collected by the states of Alabama and Louisiana which is then submitted to NMFS via the FIN program, the landings data do not indicate whether the landings from a trip come from state or federal waters. For better or worse, the SLF has historically tracked landings and effort according to depth zone, not political jurisdiction. Thus, for landings in Texas, Mississippi, and Florida, assumptions had to be made regarding which depth zones to include in federal as opposed to state waters. These determinations varied by statistical subzone given the differences in depth zones along these states' coastal areas, and because state waters extend to 9 miles off of Texas and west Florida, but only 3 miles off of Mississippi. Upon completion of this task, each permitted vessel's activities were analyzed, assuming vessels were in fact active in the fishery, and broken down into landings and revenues accruing from state versus federal waters.

Finally, certain aspects of both the NMFS and Griffin et al. (1997) approaches to estimating effort were used in this case because of the scarcity of effort interview data; the fact that NMFS' effort estimates are not calculated back to the vessel level; and because the data from Alabama and Louisiana do not report depth zone, which is a variable used in both the NMFS and Griffin et al. (1997) methods.

The results from this analysis generated the following findings. First, with respect to Preferred Alternative 10.B, it was determined that, of the 2,951 vessels that have been issued permits, 285 did not meet the December 6, 2003, control date. That is, the number of permitted vessels would be 2,666. However, of those 285 vessels, activity in the fishery during 2002 could not be found for 126 of them. That is, these vessels were "inactive" or latent. As discussed in the description of the fishery, the reasons for this finding could be numerous, and it should not be forgotten that data management issues are one of those reasons. In addition, 87 of the 285 vessels were determined to only operate in state waters. As such, there would be no direct economic effects on these vessels as a result of selecting Preferred Alternative 10.B. However, some consideration should still be given to the fact that they would be precluded from future participation in the EEZ fishery, at least in the short-term and until which time they could purchase a permit when a market develops.

That leaves 72 vessels that were found to be active in the EEZ fishery and thus would be adversely impacted under this alternative. Of these vessels, 45 are large and 27 are small. As a result of not being able to trawl in the EEZ, and assuming that the losses incurred by these vessels would only be their landings and revenues from the EEZ, revenue losses for

these vessels range from 0.8% to 100% of their total fishing revenues, with the average revenue loss being $43,342, or 49.3%. The total loss of revenues is approximately $3.12 million and the loss of landings is approximately 1.06 million pounds. The estimated amount of effort removed from the EEZ fishery is approximately 2,745 days fished.

Most of these losses would be imposed on the 45 large vessels, as they account for nearly 899,000 pounds of the lost landings, $2.75 million of the lost revenues, and 2,281 of the removed days fished. The other 162,000 pounds, $373,000 of lost revenues, and 464 days fished are from the 21 small vessels. This implies an average revenue loss of 54.3% for large vessels and 29.6% for small vessels. These types of losses will likely result in the vessels being forced out of the Gulf shrimp fishery completely, at least in the short-term. If the vessels are in fact forced to shut down, this would also cause a loss in employment of approximately 238 crew jobs (72 vessels * 3.3 crew per vessel on average).

With respect to impacts on dealers/wholesalers, 58 dealers would be adversely impacted as a result of the losses in landings and revenues to the harvesting sector. The range of their losses in shrimp sales ranges from 0% to 100%, with an average loss of 7% of sales. In the current economic climate, a 7% loss in sales would be considered significant for these businesses, particularly those with lower levels of sales.

In general, it is difficult to ascertain whether processors would be adversely impacted by this alternative, or Alternatives 10.C and 10.D for that matter. The problem lies in the fact that existing data does not indicate whether and how much of the product they use is domestic or imported. Such information is definitely not available at the firm level. Further, once shrimp are harvested and purchased, they are not tracked to the processor level. Thus, it is not possible to discern where shrimp go after they are purchased by dealer/wholesalers. The most that can be said is, if any processors use product harvested by the affected vessels, like the dealer/wholesalers, they would be adversely affected as well. This is particularly true for small to medium sized processors. On the other hand, given the prevalent use of imported product, processors may be able to substitute foreign product in place of any lost domestic product, though such a result would potentially not be seen as desirable by firms in either the processing or the harvesting sector.

Under Alternative 10.C, only 161 vessels would not qualify for a moratorium permit. That is, the number of permitted vessels would be 2,790. Of those 161 vessels, activity in the fishery during 2002 could not be found for 68 of them and 46 operated in state waters only. That means that only 47 vessels, 26 large and 21 small, were found to be active in the EEZ fishery and thus would be directly impacted under this alternative. The total losses to these vessels are approximately 733,800 pounds of shrimp, $2.17 million in revenue from the EEZ component of the fishery. Thus, the average loss in revenue is $46,203, or 48.4%. The number of days fished removed from the EEZ is 2,134. As under Preferred Alternative 10.B, the large vessels would account for the majority of these losses; 612,200 pounds, $1.93 million, and 1,733 days for landings, revenues, and effort respectively. The percentage loss in revenue for large vessels ranges from 0.9% to 100%, with an average of 68.9%. Small vessels would account for the remaining losses of 121,600 pounds,

$242,800 in revenues, and 401 days fished. The percentage loss in revenues for small vessels ranges from 1.1% to 100%, with an average of 22.9%. Assuming these vessels would be forced to cease operations in the short-term, the loss in crew employment is estimated to be approximately 155 jobs.

With respect to dealer/wholesalers, 48 would be adversely impacted. Their losses in shrimp sales would range from 0% to 100%, with an average of 7.5%.

Finally, under Alternative 10.D, based on currently available information as explained above, it was determined that 347 vessels would not be issued a moratorium permit. That is, the number of permitted vessels would be 2,604, which is less than under Preferred Alternative 10.B or Alternative 10.C. Of these 347 vessels, activity in the fishery during 2002 could not be found for 88 vessels. In addition, 72 vessels were found to only operate in state waters. The remaining 187 vessels were found to be active and thus would be adversely impacted under Alternative 10.D. Given that these vessels would have had a permit at some time between November 2002 and December 2004, the large number of excluded vessels is likely a reflection of the number and nature of vessels that have been repossessed or have been tied to the docks for economically related reasons over the past year (i.e. the number is relatively high and the vast majority are large vessels, which allegedly have been those most subject to repossession). In such instances, given the possibility that these vessels may not operate in the fishery in the future, the current owners may not believe it worthwhile to renew their permits, or may not think it necessary if they believe the Council will select a different alternative under which their vessel would qualify, such as Preferred Alternative 10.B.

Regardless, the losses in landings, revenues, and effort to the fishery are approximately 4.84 million pounds, $15.57 million, and 12,875 days fished. The average loss of revenues per vessel is $83,259 or 71.8%, which is very high. Of the 187 impacted vessels, 168 are large and 19 are small. For the large vessels, average revenue loss ranges from 0.2% to 100%, with an average of 76%. They would account for the vast majority of the landings, revenue, and effort losses; 4.73 million pounds, $15.35 million, and 12,559 days fished, respectively. The loss in revenue to the small vessels would be much less, ranging from 0.9% to 100%, and averaging 35%. These vessels account for the remaining losses of 117,000 pounds, $219,500 in revenues, and 316 days fished. If all vessels cease operations, the expected loss in crew employment is 617 jobs.

Since the losses to the harvesting sector would be larger, the losses to the dealer/wholesaler sector would be larger under this alternative as well. Specifically, 88 dealers would be adversely impacted as a result of the losses in the harvesting sector. The loss in shrimp sales ranges from 0% to 100%, with an average loss of 8.6% in sales per dealer. Again, this average loss in shrimp sales is much higher than under Preferred Alternative 10.B and particularly Alternative 10.C.

With respect to evaluating impacts on processors, keeping in mind previous statements, any potential impacts in that sector would be less and the least likely under Alternative

10.C, followed by Preferred Alternative 10.B, with Alternative 10.D exposing them to the greatest risk of experiencing adverse impacts from the moratorium.

The impacts noted above only represent the direct impacts on the harvesting sector. Whenever an industry loses revenues/sales and associated jobs, the effects of those losses will spread to other associated industries within the local/regional economy. That is, when one company or industry loses revenues/sales, other companies and industries that conduct business with them will also experience a loss. For example, when shrimp fishermen lose revenues, they are not likely to buy as many inputs (e.g. fuel, ice, etc.), and they do not have product to sell to dealers and processors, who then also have less to sell to businesses at the retail level. These are commonly referred to as "multiplier effects." As a result of these effects, the losses to the local or regional economy will be greater than the initial, direct losses to the harvesting sector. Such losses pertain not only to sales or output, but to employment as well. According to NMFS (2004), the sales/output multiplier associated with domestic shrimp production is approximately 3.58. This means that, for every $1 of lost shrimp production, the total loss of sales/output to the economy will be $3.58. Similarly, the employment multiplier was estimated to be approximately 1.81. So, for every job lost in the harvesting sector, the total loss of jobs to the economy will be 1.81.

Given these multiplier values, with respect to Preferred Alternative 10.B, and Alternatives 10.C and 10.D, the expected total losses in sales/output and jobs are as follows: for Preferred Alternative 10.B, the losses in sales/output and jobs are $11.17 million and 431 jobs, respectively; for Alternative 10.C, the losses in sales/output and jobs are $7.7 million and 281 jobs, respectively; and for Alternative 10.D, the losses in sales/output and jobs are $55.74 million and 1,117 jobs, respectively.

It is important to keep in mind that the losses in landings, revenues, and the resulting multiplier effects noted above only account for the removal of activity from the EEZ component of the fishery. That is, one possible assumption to make when analyzing the impacts of these alternatives is that non-qualifying vessels operating in the EEZ will permanently lose landings and revenues resulting from their fishing activities in the EEZ, but will also continue their current operations in state waters. However, at least for the small vessels, there may be the option of shifting their activities completely to state waters. In general, small vessels tend to be relatively more dependent on landings from state waters and are relatively more capable of operating in those waters. Conversely, for large vessels, shifting all their effort to state waters is a much less viable option since they are relatively more dependent on landings from the EEZ and relatively less capable of operating in state and particularly inshore waters. Thus, it is very likely that large vessels would be forced to exit the fishery in the short-term if they do not qualify for a moratorium permit. If large vessels do in fact cease operations, their losses would be greater than the estimates given above since their landings and revenues from state waters would also be lost (i.e. they would lose 100% of their landings and revenues). All of their effort would also be removed from the fishery and all employment associated with their operations would be lost. Conversely, if small vessels can shift their effort from the EEZ to state waters, the only result would be a change in the spatial distribution of their landings and revenues.

That is, small vessels would not be adversely impacted by the moratorium (i.e. no loss of landings, revenues, or employment), though some effort would shift to state waters. This alternative set of assumptions yields some slightly different findings for the fishery overall than those provided above.

Specifically, for Preferred Alternative 10.B, under this different set of assumptions, the loss of landings and revenues to the harvesting sector would be 1.72 million pounds and $4.91 million respectively. Similarly, effort would fall by 4,206 days. Approximately 464 days of effort would shift from federal to state waters. Further, since only the 45 large vessels would cease operations, the loss in jobs would only be 149. Fewer dealers would also be impacted (51). The average loss of sales to dealers is slightly more, ranging from 0% to 100%, with an average of 8%. Given the sales and employment multipliers noted above, the expected total losses in sales/output and employment would be approximately $17.58 million and 270 jobs respectively.

For Alternative 10.C, the loss of landings and revenues to the harvesting sector under the new set of assumptions is 1.22 million pounds and $3.37 million, respectively. The reduction in effort is also greater at 3,798 days. Approximately 401 days of effort would shift from federal to state waters. The estimated number of lost jobs is 86. The number of adversely impacted dealers/wholesalers is slightly less (46). The range and average of losses in sales is 0% to 100% and 8.5% respectively, which is higher than under the first set of assumptions. Taking multiplier effects into account, the expected total losses in sales/output and employment would be approximately $12.1 million and 156 jobs respectively.

Finally, for Alternative 10.D, the loss of landings and revenues to the harvesting sector would be 6.29 million pounds and $19.89 million, respectively, which is considerably more than the losses estimated under the first set of assumptions. Similarly, the decrease in effort is greater at 14,562 days. Approximately 316 days of effort would shift from federal to state waters. The estimated number of lost jobs in the harvesting sector is 554. The number of adversely impacted dealers/wholesalers is also greater (101). The loss of sales to dealers is the same as under the first set of assumptions (i.e. range of 0% to 100%, with an average loss of 8.6%). Taking multiplier effects into account, the expected total loss in sales/output and employment would be approximately $71.2 million and 1,003 jobs respectively.

The primary conclusion of these findings is that, under the second set of assumptions wherein large non-qualifying vessels cease operations and small non-qualifying vessels shift all of their effort to state waters, the adverse economic impacts of Preferred Alternative 10.B, and Alternatives10.C and 10.D are greater, and considerably so for Alternative 10.D, than under the first set of assumptions. However, though the impacts under Alternative 10.D are still greater than under Preferred Alternative 10.B and Alternative 10.C, the difference in those impacts is much greater under the second set of assumptions. This result is due to the predominance of large vessels within the group of non-qualifying vessels under Alternative 10.D relative to Preferred Alternative 10.B and

Alternative 10.C. Furthermore, even though the shift of effort from federal to state waters is greatest under Preferred Alternative 10.B, the amount of effort shifting from federal to state waters under each of the alternatives is insignificant when compared to the total level of effort in the fishery (0.17% at most under Preferred Alternative 10.B).

It is important to note that the impacts under Preferred Alternative 10.B, as well as Alternative 10.C and 10.D, will likely be partially mitigated by the fact that permits will be full transferable under each of these alternatives. As previously discussed, it is not possible to predict with certainty how many owners of non-qualifying vessels will in fact purchase permits during the moratorium. However, existing evidence suggests that there would be 438 latent permits potentially for sale under Preferred Alternative 10.B, 486 under Alternative 10.C., and 466 under Alternative 10.D, where a "latent" permit is one held by a vessel that is not active in the fishery (EEZ or state waters). Given that the greatest number of vessels expected to need a permit in order to continue current operations is 187 (Alternative 10.D, assumption 1), the quantity of permits potentially available for sale should exceed the quantity demanded. This fact combined with the depressed economic condition of the fishery supports the plausibility of the previously noted $5,000 permit purchase price estimate.

Thus, under Preferred Alternative 10.B, at least 45 vessels and as many 72 vessels will likely need to buy a permit in order to continue current operations.[22] Therefore, the total cost of purchasing permits for these vessels' owners is expected to range between $225,000 and $360,000. Under Alternative 10.C., at least 26 vessels and as many as 47 vessels will likely need to buy a permit in order to continue current operations, and thus the total cost would range between $130,000 and $235,000. Finally, under Alternative 10.D., at least 168 vessels and as many as 187 vessels would need to buy a permit in order to continue current operations, resulting in a total cost of between $840,000 and $935,000.[23]

For the vast majority of vessels, it is undoubtedly the case that the cost of purchasing a permit would be less than the cost of shutting down operations, and would likely be their preferred option, *ceteris paribus*. However, it cannot simply be assumed that all vessel owners who need to buy permits will be able to do so, or do so at the estimated price. Many factors could preclude a vessel owner from purchasing a permit, particularly in the short-term. For example, qualifying permit holders that are true "speculators" may decide to hold on to their permits for several reasons, including a desire to wait and see the value other sellers are able to obtain for their permits, a desire to hold onto the permit until economic conditions improve which would in turn be expected to increase the value of their permits, or a desire to enter the fishery at some point in the future if economic conditions improve. Furthermore, although $5,000 may not constitute a large sum of money for some vessel owners, it is important to remember that: 1) this is an estimated average, and some buyers would be expected to pay more and 2) some owners may be

[22]It is assumed that vessels not active in the EEZ do not need to purchase permits in order to continue current operations.

[23]It is unlikely that the cost of purchasing permits would generate multiplier effects throughout the local and regional economies, and thus such effects are not considered in the analysis.

willing to pay for a permit, but may not have the ability to pay. For less economically viable operations, $5,000 is a relatively greater burden compared to economically profitable operations. Given the negative economic returns on average in the fishery during recent years, some owners may not have the financial capital to purchase a permit. In the current economic climate, it is unlikely that financial institutions, which have already been impacted as a result of owners not being able to pay their boat mortgages, would be willing to loan such funds to struggling vessel owners. So, while purchasing a permit may be a preferable option to most vessel owners, it may not be a viable option for some.

Nonetheless, in conclusion and regardless of which set of assumptions are used or whether a non-qualifying vessel shuts down or is able to purchase a permit, the results of the economic analysis of the alternatives indicate that, if the goal is to minimize short-term adverse impacts and/or the likelihood of such impacts on fishery participants while still achieving short-term and long-term objectives, and thereby achieve the greatest net economic benefit, Alternative 10.C is the option that attains this result. Preferred Alternative 10.B would generate slightly greater adverse economic impacts in the short-term. According to currently available information, Alternative 10.D. would generate the greatest, adverse economic impacts in the short-term. So, the conclusion is that, after Alternative 10.C, Preferred Alternative 10.B would yield the next highest level of net economic benefits in the long-term, with Alternative 10.D yielding the least, though still more than the No Action alternative (Alternative 10.A).

The conclusions noted above must be qualified due to the uncertainty regarding vessels that may or may not renew their permits and vessels that may purchase new permits prior to the publication date of the final rule that will implement this amendment. Should all of the vessels that did not renew their permits in calendar year 2005 do so before the final rule's publication date or if additional vessels purchase permits, then no previously permitted vessels would be excluded and thus there would be no known short-term, adverse economic impacts under Alternative 10.D. In that instance, Alternative 10.D would yield lower short-term, adverse economic impacts than Alternative 10.C, and thus would be the alternative that minimizes such impacts. However, it is also possible that none or only some of the vessels will renew their permits. It is not possible to predict with any degree of certainty whether any or all of these vessels will in fact renew or if new entrants will obtain their permits prior to the final rule's publication date. Thus, it is not possible to conclude with complete certainty whether Alternative 10.D will generate the greatest, the least, or an equivalent level of adverse, short-term economic impacts relative to Preferred Alternative 10.B or Alternative 10.C.

Primarily for information purposes, the revenue and physical characteristics of the fleets that would exist under each of the alternatives are presented in Tables 5.14-5.32. This information will give the Council a different perspective on the impacts of the different alternatives compared to the information presented above. The differences and losses in revenues under each alternative are directly deducible from the information in these tables. However, the primary purpose of the tables is to illustrate that, on average, the primary

differences in revenues, dependency on shrimp revenues, and physical characteristics are determined far more by vessel size and whether vessels are active in the fishery or not than by the choice of the permit moratorium alternative, which directly relates back to the conclusion that, regardless of which alternative is selected, the fleet will not look that much different, and thus the path to recovery will also not be much different.

5.5.11 Action 11: Reporting of landings during the moratorium

Preferred Alternative 11.B would require that all permitted vessels report their landings, and not just selected vessels (Alternative 11.A). By requiring that all vessels report landings during the permit moratorium, the Council would have a universe to stratify vessels' catches into different classes or categories. More basically, such information would ensure that the Council knew with certainty which vessels were in fact active in the fishery and the level of that activity. This information could provide a basis for managing fishery participation and fishing effort in the future, if such management is determined to be necessary. Without such information, it would be considerably more difficult for the Council to develop and evaluate alternative long-term effort management programs. As has been previously discussed, the lack of appropriate trip ticket programs in Mississippi and Texas, in conjunction with current data management practices within NMFS, preclude determinations of which vessels are and are not active in the fishery, as well as the nature and level of that activity, with certainty. Since vessel owners would already have such information at their disposal and many would already be reporting it to various programs, the cost of providing and certifying the landings, at least during the moratorium and until programmatic changes can be instituted in the aforementioned data collection programs, should be minimal; possibly no more than the cost of a stamp and a piece of paper depending on how the information is to be provided. The information could be included as part of the vessel and gear characterization form or on the paper logbook without any significant increase in time burden, particularly since the time burden estimate for the paper logbook was based on a previously developed form that included such information.

5.6 Private and Public Costs

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources that can be expressed as costs associated with the regulations. Costs associated with this specific action will be determined upon the selection of alternatives, but will include:

Council costs of document preparation, meetings, public hearings, and information dissemination $175,000

NMFS administrative costs of document preparation, meetings, and review $120,000

Industry cost for royal red shrimp endorsements..... $280

Law enforcement costs $0

TOTAL $295,280

The Council and NMFS costs of document preparation are based on staff time, travel, printing, and any other relevant items where funds would be expended directly for this specific action. Enforcement costs are anticipated to be $0 because none of the actions in this amendment would change fishing activities.

5.7 Determination of a Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in a rule that may: (1) have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of the recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

The total ex-vessel value of the fishery is approximately $376 million and, assuming an output multiplier of 2.7 as has been assumed in previous analyses, the total economic impact of this production is likely no more than $1.02 billion. The economic impacts of the proposed actions should be considerably less than $100 million. Specifically, the analyses within the RIR indicate that the economic impact of the preferred alternatives are at least $225.3 thousand, but no more than $17.58 million. Only if Alternative 10.D under Action 10 was selected (which it was not), wherein the estimated economic impact is as high as $71.2 million, though under a highly unlikely set of assumptions, is it reasonably possible that the $100 million threshold could be met. Therefore, the $100 million threshold will likely not be met.

Measures in this amendment do not interfere or create inconsistency with any action of another agency, including state fishing agencies. Measures in this amendment do not affect any entitlements, grants, or user fees. Loan programs through the Small Business Administration (SBA) may be affected to the degree that the proposed actions force additional shrimp harvesting operations to shut down, and loans held by the SBA on these operations are defaulted. No systematic data are available at this time to determine how many of these operations actually have loans from the SBA. With the exception of electronic logbooks, the alternatives considered in this amendment have been used in other areas of the Gulf of Mexico and, thus, are deemed not to raise novel legal and policy issues.

Since the potentially proposed actions will not result in an economic effect in excess of a $100 million on the economy, do not interfere or create inconsistency with any action of another agency, do not affect entitlements, grants, or user fees, and do not raise novel legal or policy issues, the conclusion is rendered that any regulations promulgated as a result of the actions in this amendment would not constitute a "significant regulatory action."

5.8 Initial Regulatory Flexibility Analysis

Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration. The RFA does not contain any decision criteria; instead the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of various alternatives contained in the FMP or amendment (including framework management measures and other regulatory actions) and to ensure that the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

With certain exceptions, the RFA requires agencies to conduct an Initial Regulatory Flexibility Analysis (IRFA) for each proposed rule. The IRFA is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. An IRFA is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." In addition to analyses conducted for the RIR, the IRFA provides: (1) a description of the reasons why action by the agency is being considered; (2) a succinct statement of the objectives of, and legal basis for, the proposed rule; (3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; (4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; and (5) an identification, to the extent practicable, of all relevant Federal rules, which may duplicate, overlap, or conflict with the proposed rule.

Description of the reasons why action by the agency is being considered: A description and discussion of the reasons why this action is being considered is presented in Section 3.0, Purpose and Need for this amendment, and are incorporated here by reference.

Statement of the objectives of, and legal basis for, the proposed actions: The specific objectives of the proposed actions are enumerated in Section 4.0 of this amendment. This

section is incorporated herein by reference. As amended, the M-SFCMA provides the legal basis for the proposed actions.

Description and estimate of the number of small entities to which the proposed actions will apply: The number of small entities that will be affected by the proposed actions is 2,951. This figure represents the number of vessels that have been permitted since the inception of the federal Gulf shrimp permit. Depending on the alternatives selected, certain actions will apply to all vessel permit holders, while others may only apply to a subset of those permit holders. With respect to the actions specific to the royal red shrimp fishery, they would affect 15 small entities at most, though all but one of these entities is included in the larger group of 2,951.

The amount of revenue earned within alternative fisheries differs considerably between vessels. Average revenue per vessel is $100,477, though revenues range from $0 to $473,564. On average, vessels rely on the Gulf food shrimp fishery for nearly 79% of their revenues. Therefore, most vessels, though not all, have a relatively high degree of dependency on the Gulf food shrimp fishery. However, some vessels appear to have no reliance on the Gulf food shrimp fishery (i.e. they are "inactive" or "latent" vessels), and this fact weighs down the average revenue for the fleet as a whole. With respect to physical characteristics, as opposed to landings and revenues, the fleet is much more homogeneous, though some differences do exist.

Vessels less than 60 feet in length (small vessels) generate lower revenues on average ($30,568) relative to their larger counterparts of 60 or more feet in length ($132,890). The range of revenues for large vessels is between $0 and $473,564 while it's between $0 and $246,391 for small vessels. Note that all royal red shrimp vessels fall into the "large" vessel category. On average, "small" vessels are also "smaller" in regards to almost all of their physical attributes (e.g. they use smaller crews, fewer and smaller nets, have less engine horsepower and fuel capacity, etc.). Small vessels are also older on average. Larger vessels also tend to be steel-hulled. Fiberglass hulls are most prominent among small vessels, though steel and wood hulls are also common. Nearly two-thirds of large vessels have freezing capabilities while few small vessels have such equipment. Small vessels still rely on ice for refrigeration and storage, though more than one-third of large vessels also rely on ice. Some vessels are so small that they rely on live wells for storage.

An important difference between large and small vessels is with respect to their dependency on the food shrimp fishery. The percentage of revenues arising from food shrimp landings is nearly 87% for large vessels, but only slightly more than 61% for small vessels. Thus, on average, large vessels are more dependent than their smaller counterparts on the food shrimp fishery. However, it is also the case that dependency on food shrimp is much more variable within the small vessel sector than the large vessel sector. That is, many small vessels are quite dependent on food shrimp landings, while many others illustrate little if any dependency.

When looking at the distribution of revenues across vessels, of the 2,951 permitted vessels, 554 did not have any verifiable Gulf shrimp landings in 2002, while 2,397 vessels did. Large and small vessels comprised approximately 75% and 25% of the active group. However, small vessels represented a majority of the inactive group, nearly 53% compared to 47% for large vessels. If inactive vessels are removed from consideration, for the permitted group as a whole, dependency on Gulf shrimp revenues increases from about 79% to more than 97%. For large vessels, the increase is from about 87% to nearly 98%. But, consistent with the statistics above, the change in dependency is most dramatic for the small vessels, which increases from about 61% to nearly 94% when the inactive vessels are removed from consideration.

Finally, according to the most recent projections, on average, both small and large vessels are experiencing significant economic losses, ranging from a -27% rate of return in the small vessel sector to a -36% rate of return in the large vessel sector (-33% on average for the fishery as a whole). Therefore, almost any but the most minor additional financial burden would be expected to generate a significant adverse impact on affected vessels and potentially hasten additional exit from the fishery.

Description of the projected reporting, record keeping, and other compliance requirements of the proposed actions, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records: Given that the Council has chosen to require the vessel and gear characterization form for all permitted vessels under Action 9, the only cost associated with the form would be the time burden associated with its completion, which is estimated to be approximately 30 minutes in its current form. Since this form is being required at least partially in lieu of paper logbooks, all questions on the form are likely to be asked of all permit owners. Using the previously discussed methodology for estimating the opportunity cost of time burdens, the form would create an annual opportunity cost of between $4 and $9 per vessel, which is minimal and far less than a paper logbook requirement. Further, since the Council has chosen to require that all vessels submit their landings information to NMFS under Action 11, this information could be included on either the vessel and gear characterization form or the existing permit application form without any significant increase in the estimated time burdens associated with either form, particularly the former since the time burden estimate is based on a previously developed form that in fact requested that information.

Identification of all relevant Federal actions which may duplicate, overlap, or conflict with the proposed actions: No duplicative, overlapping, or conflicting Federal actions have been identified.

Substantial Number of Small Entities Criterion: Since all permitted vessels would be affected by one or more of the proposed actions in this amendment, the threshold of a "substantial" number is concluded to be met in general. However, as explained below, the vast majority of these vessels will not be impacted under the most significant actions.

Significant Economic Impact Criterion: The outcome of "significant economic impact" can be ascertained by examining two issues: disproportionality and profitability.

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

With respect to the determination of whether economic impacts will be significant, due to the lack of information to the contrary, all affected entities are determined to be "small." Therefore, disproportionality of impacts between large and small entities is not an issue.

Profitability: Do the regulations significantly reduce profit for a substantial number of small entities?

According to the most recent projections, on average, both small and large vessels are experiencing significant economic losses, ranging anywhere from a -27% rate of return in the small vessel sector to a -36% rate of return in the large vessel sector (-33% on average for the fishery as a whole). Therefore, almost any but the most minor additional financial burden would be expected to significantly reduce profit since profits are negative throughout the fishery. Actions 2 through 9 and Action 11 would not affect vessel profitability since they impose no direct financial costs. However, it should be noted that reporting requirements under Actions 9 and 11 will likely generate a minimal opportunity cost of approximately $9 per vessel.

With respect to Action 1, the royal red shrimp endorsement requirement would result in an additional cost of $20. In and of itself, this minimal cost would not significantly reduce profit for the 14 to 15 vessels in that fishery.

The sole action that could impose significant costs, and thereby significantly reduce profitability, is the permit moratorium (Action 10). Under Preferred Alternative 10.B, of the 2,951 vessels that have been permitted, 285 vessels would not be issued a moratorium permit. However, of those 285, 126 were found to be inactive and an additional 87 vessels were found to operate exclusively in state waters. The remaining 72 vessels, of which 45 are large and 27 are small, were active in the EEZ. Assuming these vessels would only lose their landings from the EEZ, they would face revenue losses ranging between 0.8% and 100%, with an average loss of 49.3%. Large vessels will face a larger revenue loss on average (54.3%) than their smaller counterparts (29.6%). However, assuming small vessels shift their effort entirely into state waters and large vessels exit the fishery, then only the 45 large vessels would experience a loss in landings and revenues, though that loss would be 100% of their revenues. On the other hand, since the permits will be fully transferrable under the moratorium, it could also be assumed that the 72 vessels active in the EEZ may be able and willing to purchase a permit in order to continue current operations. Given an estimated permit purchase price of $5,000, this cost would represent 5.7% of these vessels' average revenues. Thus, in the currently adverse economic climate, and regardless of which behavioral assumptions are made, profits would be significantly reduced for the 45 or 72 directly affected vessels.

Description of significant alternatives to the proposed actions and discussion of how the alternatives attempt to minimize negative economic impacts on small entities: Actions 2 through 7 do not impose costs of any kind on the potentially impacted vessels. Under Action 8, the primary purpose of which is to improve estimates of effort and bycatch, the additional reporting and record keeping burdens considered under some of the alternatives could be significant, particularly when taken in combination. For paper logbooks, assuming a time burden of 10 minutes per daily form, and 182 days at sea per vessel per year, the average annual time burden per vessel would be approximately 30.33 hours. From an economic perspective, even though there is no direct cash expense from a paper logbook program, there is an opportunity cost associated with any time burden created by additional reporting requirements. Typically, opportunity cost is approximated using the average wage or salary of the affected persons. Since vessel owners/captains would be responsible for submitting the logbook forms, it would be most appropriate to use the average wage of first line supervisors/managers in the fishing, forestry, and farming industries. As of May 2003, which is the most currently available information, the BLS reported that the mean wage of persons in this occupation group was $18.14. Therefore, the average annual opportunity cost per vessel of the paper logbook reporting requirement would be approximately $550.19 ($18.14/hour * 30.33 hours). If only a sample of vessels were selected to report, then the burden estimate would be proportionally less and dependent on the chosen sampling rate. However, the Council's preferred alternative is to not require paper logbooks at any level of coverage, and thus no opportunity costs would be imposed on the industry.

The requirement of ELBs and observers will force fishermen to make their vessels available for placement of either upon request. However, in both instances, the Council has minimized the inconvenience burden by only imposing these requirements on a sample rather than all of the permitted vessels. Should vessel owners consider it necessary to purchase insurance in order to protect themselves from potential liability claims, that could impose a significant burden. However, it is not expected that the observer program will require vessels to carry liability insurance, and thus the decision to carry such coverage would be the vessel owner's choice rather than a result of the preferred alternatives under Action 8. Since NMFS is expected to cover the costs of purchasing the ELB units, managing the ELB program, and covering the costs of the observer program, the preferred alternatives under Action 8 are not expected to impose any direct costs on the industry.

With respect to Actions 9 and 11, while the Council considered the option of not requiring the vessel/gear characterization form and landings information, or only requiring them from a sample of vessels, those alternatives would have defeated the purposes of those actions, which are to generate estimates of important measures of fishery performance and information important to potentially developing alternatives for long-term effort management in the fishery. Furthermore, these requirements, in combination with a sample of ELBs, is far less burdensome than requiring paper logbooks from all vessels or even a sufficient sample of vessels.

The sole action that could impose significant costs, and thereby significantly reduce profitability, is the permit moratorium (Action 10). Of the 2,951 vessels that have been permitted, under Alternative 10.C, the number of vessels that would not be issued a moratorium permit would be 161. However, of those 161, 68 were not active according to the best available data and 46 operated in state waters only. Thus, it is concluded that these vessels' profits would not be affected. Assuming that the remaining 47 vessels would lose all their landings and revenues from the EEZ, revenue losses per vessel would range between 0.9% and 100%, with an average 48.4% loss in revenues. However, if it is assumed that small vessels shift their operations into state waters and large vessels exit the fishery, then only the 26 large vessels would be directly impacted. For these vessels, they would lose 100% of their revenues. Contrariwise, since the permits will be fully transferrable under the moratorium, it could also be assumed that the 47 vessels active in the EEZ may be able and willing to purchase a permit in order to continue current operations. Given an estimated permit purchase price of $5,000, this cost would represent 5.2% of these vessels' average revenues. Thus, in the currently adverse economic climate, and regardless of which behavioral assumptions are made, profits would be significantly reduced for the directly impacted vessels. However, relative to the number of permitted vessels, neither 26 nor 47 vessels would likely be considered a substantial number of significantly affected entities.

Under Alternative 10.D, of the 2,951 vessels that have been permitted, 347 vessels would be denied a moratorium permit according to currently available information. However, of those 347 vessels, 88 were found to be inactive and 72 only operated in state waters. Thus, it is concluded that these vessels' profits would not be affected. The remaining 187 vessels were active in the EEZ and thus would be directly impacted. Specifically, would lose all their landings and revenues from the EEZ, percentage losses in revenue would range from 0.2% to 100%, with an average loss of 71.8%. However, if it is assumed that small vessels shift their operations into state waters and large vessels exit the fishery, then only the 168 large vessels would be directly impacted. For these vessels, they would lose 100% of their revenues. Contrariwise, since the permits will be fully transferrable under the moratorium, it could also be assumed that the 187 vessels active in the EEZ may be able and willing to purchase a permit in order to continue current operations. Given an estimated permit purchase price of $5,000, this cost would represent 4.3% of these vessels' average revenues. Thus, in the currently adverse economic climate, and regardless of which behavioral assumptions are made, profits would be significantly reduced for the directly affected vessels. Relative to the number of permitted vessels, either 187 (6.3% of the permitted fleet) or 168 vessels would likely be considered a substantial number of significantly affected entities. However, it should be kept in mind that, if all the owners of these 187 vessels were to renew their permits prior to the publication of the final rule, then none of these vessels would be significantly impacted.

Although Alternative 10.C would generate less adverse economic impacts relative to Preferred Alternative 10.B, it would also allow for a higher number of latent or speculative permit holders, which is contrary to the Council's objectives under this action. Further, the Council attempted to mitigate the impacts of this action by allowing permits to be fully transferable. For most of the impacted vessels, particularly the large vessels, the cost of

purchasing a permit is expected to impose a smaller burden compared to the alternative of ceasing operations. The no action alternative (Alternative 10.A) would not help solve the identified short-term or long-term problems in the industry, which would also be contrary to the Council's objectives.

6.0 DESCRIPTION OF THE FISHERY

The Final Environmental Impact Statement (FEIS) for the original Shrimp FMP and the FMP as revised in 1981 contain a description of the Gulf shrimp fishery. In its appendix, the FEIS of February 1981 includes the Habitats, Distribution, and Incidental Capture of Sea Turtles. This material is incorporated by reference and is not repeated here in detail. Amendment 9 (GMFMC 1997) with SEIS updated this information.

As an overview, the management unit of this FMP consists of brown, white, pink, and royal red shrimp. Seabobs and rock shrimp occur as incidental catch in the fishery.

Brown shrimp is the most important species in the U.S. Gulf fishery with principal catches made from June through October. Annual commercial landings in recent years range from approximately 61 to 103 million pounds of tails depending on environmental factors that influence natural mortality. The fishery extends offshore to about 40 fathoms.

White shrimp, second in value, are found in near shore waters to about 20 fathoms from Texas through Alabama. There is a small spring and summer fishery for overwintering individuals, but the majority are taken from August through December. Recent annual commercial landings range from approximately 36 to 71 million pounds of tails.

Pink shrimp are found off all Gulf states but are most abundant off Florida's west coast and particularly in the Tortugas grounds off the Florida Keys. Most landings are made from October through May with annual commercial landings range from approximately 6 to 19 million pounds of tails. In the northern and western Gulf states, pink shrimp are landed mixed with brown shrimp and are usually counted as browns. Most catches are made within 30 fathoms.

The commercial fishery for royal red shrimp has expanded in recent years with the development of local markets. This deep-water species is most abundant on the continental shelf from about 140 to 275 fathoms east of the Mississippi River. Thus far, landings have not reached the MSY, OY, and TAC estimate of 392,000 pounds of tails in any year and have varied from approximately 200,000 to 300,000 pounds from a high of approximately 336,000 pounds in 1994.

The three principal species (penaeids) are short-lived and provide annual crops; however, royal red shrimp live longer, and several year classes may occur on the grounds at one time. The condition of each shrimp stock is monitored annually, and none has been classified as being overfished for over 40 years.

Brown, white, and pink shrimp are subjected to fishing from inland waters and estuaries, through the state-regulated territorial seas, and into federal waters of the EEZ. Royal red shrimp occur only in the EEZ. Management measures implemented under the M-SFCMA apply only to federal waters in the EEZ. Cooperative management occurs when state and federal regulations are consistent. Examples are the seasonal closure off Texas, the Tortugas Shrimp Sanctuary, and the shrimp/stone crab seasonally closed zones off Florida.

The NMFS has classified commercial shrimp vessels comprising the near shore and offshore fleet into size categories from under 25 feet to over 85 feet. More than half fall into a size range from 56 to 75 feet.

Federal permits for shrimp vessels are currently required, and state license requirements vary. Many vessels maintain licenses in several states because of their migratory fishing strategy. The number of vessels in the fishery at any one time varies due to economic factors such as the price and availability of shrimp and cost of fuel. In addition to the federal shrimp vessel permits, the NMFS maintains two types of vessel files, both of which are largely dependent on port agent records. One is for vessels that are recorded as landing shrimp, the SLF; the other is the VOUF that lists vessels observed at ports. The number of commercial vessels participating in the Gulf shrimp fishery is not known but approximately 2,951 vessels obtained a permit sometime within the period from implementation of Amendment 11 (December 2002) and May 5, 2005, and previous estimates from the SLF and VOUF indicated approximately 4,000 vessels. The NMFS estimates fishing effort independently from the number of vessels fishing. The NMFS uses the number of hours actually spent fishing from interview data with vessel captains to develop reports as 24-hour days fished. These estimates have been controversial and not well understood because the effort reported does not necessarily reflect the number of active vessels in the fleet.

A recreational shrimp trawl fishery occurs seasonally and almost entirely in the inside waters of the states. There are about 8,000 small boats participating using trawls up to 16 feet in width. About half the boats are licensed in Louisiana.

Bait landings of juvenile brown, pink, and white shrimp, occur in all states and are not routinely included in the NMFS statistics. Estimates from the original FMP suggest landings of about 5 MP (whole weight) in 1980.

Various types of gear are used to capture shrimp including but not limited to cast nets, haul seines, stationary butterfly nets, wing nets, skimmer nets, traps, and beam trawls. The otter trawl with various modifications, is the dominant gear used in offshore waters. A basic otter trawl consists of a heavy mesh bag with wings on each side designed to funnel the shrimp into the codend or tail. A pair of otter boards or trawl doors positioned at the end of each wing hold the mouth of the net open by exerting a downward and outward force at towing speed.

The two basic otter-trawl designs used by the Gulf shrimp fleet are the flat and the semi-balloon trawls (Klima and Ford 1970). The mouth of the flat trawl is rectangular in shape, whereas the mouth of the semi-balloon design forms a pronounced arch when in operation.

Try nets are small otter trawls about 12 to 16 feet in width that are used to test areas for shrimp concentrations. These nets are towed during regular trawling operations and lifted periodically to allow the fishermen to assess the amount of shrimp and other fish and shellfish being caught. These amounts in turn determine the length of time the large trawls will remain set or whether more favorable locations will be selected.

Until the late 1950s, most shrimp vessels pulled single otter trawls ranging from 80 to 100 feet in width (Idyll, 1963). Double-rig trawling was introduced into the shrimp fleet during the late 1950s. The single large trawl was replaced by two smaller trawls, each 40 to 50 feet in width, towed simultaneously from stoutly constructed outriggers located on the port and starboard sides of the vessels. The port trawl was towed about 150 feet in back of the starboard trawl to prevent fouling. The advantages of double-rig trawling include: (1) increased catch per unit of effort, (2) fewer handling problems with the smaller nets, (3) lower initial gear costs, (4) a reduction in costs associated with damage or loss of the nets, and (5) greater crew safety (Idyll, 1963).

In 1972, the quad rig was introduced in the shrimp fishery, and by 1976 it became widely used in the EEZ of the western Gulf. The quad rig consists of a twin trawl pulled from each outrigger. One twin trawl typically consists of two 40-foot trawls connected to a center sled and spread by two outside trawl doors. Thus, the quad rig with two twin trawls has a total spread of 160 feet versus the total spread of 110 feet in the old double rig of two 55-foot trawls. The quad rig has less drag and is more fuel efficient. For some designs, a lower opening reduces fish bycatch (David Harrington, personal communication).

Although the industry continuously works to develop more efficient gear designs and fishing methods, the quad rig is still the primary gear used in federal waters. In recent years, the skimmer trawl has become a major gear in the inshore shrimp fishery in the northern Gulf.

7.0 AFFECTED ENVIRONMENT

7.1 Physical Environment

7.1.1 Geological Features

The physical environment of shrimp has been described in detail in the EIS for the Generic Essential Fish Habitat amendment and is incorporated here by reference (GMFMC, 2004a). The

Gulf of Mexico is bounded by Cuba, Mexico, and the United States, and has a total area of 564,000 square kilometers ($km^{2)}$. Continental shelves occupy about 35% of the total Gulf area and the west Florida shelf (about 150,000 km^2) is the second largest shelf in the United States after Alaska.

The Gulf of Mexico basin was formed during the Jurassic Period with the initial breakup of Pangea. The basin's current position formed during the early Cretaceous period. The Mississippi River has had a great effect on the northern Gulf of Mexico since the late Cenozoic period. Approximately 450 million metric tons of sediment are deposited annually in the Gulf of Mexico by the Mississippi River, and this river produces more sediment than the combined deposition of all other regional rivers by an order of magnitude.

The Gulf can be divided into two major sediment provinces. East of DeSoto Canyon and southward along the Florida coast, sediments are primarily carbonates. Coarse surface deposits include quartz sand, carbonate sand, and mixtures of the two. To the west of DeSoto Canyon, sediments are terrigenous. Coarse sediments make up the very shallow nearshore bottoms from the Texas/Mexican border to off central Louisiana, from the shore to the central third of the shelf. Beyond 80 meters (m), fine sediments are also strongly represented. Fine sediments are limited to the northern shelf under the influence of the Mississippi and Atchafalaya rivers.

The west Florida shelf provides a large area of hard bottom habitat. It is comprised of low relief hard bottoms that are relict reefs or erosional structures. Some high relief can be found along the shelf edge in waters 130 to 300 m deep. Hard bottom provides extensive areas where reef biota such as corals can become established. These hard bottom areas have become important reef fish fishing areas. Some of these areas such as the Tortugas North and South closed areas, the Florida Middle Ground habitat area of particular concern (HAPC), the Steamboat Lumps closed area, and the Madison and Swanson closed area limit fishing activities within their boundaries.

Off the Alabama/Mississippi shelf and shelf break, irregular-shaped aggregates of calcareous organic forms called pinnacles are found. These pinnacles average about 9 m in height and are found in waters about 80 to 130 m deep. In addition to the pinnacles, low-relief hardbottom areas can be found in waters less than 40 m adjacent to Florida and Alabama.

While the Louisiana/Texas shelf is dominated by muddy or sandy terrigenous sediments, banks and reefs do occur on the shelf. Rezak et al. (1985) grouped banks into the mid-shelf banks, (defined as those that rise from depths of 80 m of less and have a relief of 4 to 50 m) that are made of relatively bare, bedded Tertiary limestones, sandstones, claystones, and siltstones, and relict reefs (defined as those that rise from water depths of 14 to 40 m and have a relief of 1 to 22 m) that are relict carbonate shelf. The Flower Garden Banks National Marine Sanctuary is located about 150 km directly south of the Texas/Louisiana border. This coral reef is perched atop two salt domes rising above the sea floor and ranges from 15 to 40 m deep.

7.1.2 Oceanographic Features

As stated in the Council's Generic Essential Fish Habitat Amendment, the Gulf is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel. The Mississippi and Atchafalaya rivers account for over half of the freshwater discharge into the Gulf. Oceanic conditions are primarily affected by the Loop Current, the discharge of freshwater in to Northern Gulf, and a semi-permanent, anticyclonic gyre in the western Gulf.

Oceanic temperature regimes have been extensively mapped by Darnell et al. (1983), Darnell and Kleypas (1987), NOAA (1985), MMS (1997), and Donaldson et al. (1997). Water temperatures range from 12☜C to 29☜C depending on time of year and depth of water. In general, water temperatures decline during cooler months and increase in the summer. The greatest difference is found in nearshore waters where temperatures can be 10 to 15ºC warmer in the summer compared to the winter. Along the shelf edge, this difference is only about 1to 4ºC. In the summertime, coastal surface and bottom waters are warmer than offshore waters; however, this trend is reversed in the winter.

Salinity varies seasonally and is dependent on the amount of freshwater input. During months of low freshwater input, coastal salinities generally range between 29 and 32 parts per thousand (ppt) (MMS, 1997). At times of high freshwater input, salinities can decrease to less than 20 ppt. In the open Gulf, salinities are less variable than coastal waters and are generally around 36 ppt (MMS, 1997). The Mississippi and Atchafalaya rivers provide about half the freshwater input into the Gulf; however, the influence of these waters on salinity is generally restricted to surface waters.

Over the entire Gulf, dissolved oxygen averages about 6.5 parts per million (ppm) (Barnard and Froelich, 1981). During warmer months, localized hypoxic events (<2.0 ppm) occur in such places as Mobile Bay, Alabama and Tampa Bay, Florida. Hypoxic events are usually caused by two factors - stratification of marine waters and decomposition of organic matter. A major hypoxic event occurs each year over a large area of the Louisiana continental shelf with seasonally-depleted oxygen levels (< 2 ppm). The oxygen depletion begins in late spring, reaches a maximum in midsummer, and disappears in the fall. The event is caused by nutrient over-enrichment from anthropogenic sources. These excess nutrients lead to increased algal production and increased availability of organic carbon within an ecosystem. When the rate of oxygen use by decomposers exceeds the rate of oxygen resupply from surface waters, hypoxia occurs.

Riverine inputs, wind, and currents are the primary agents of turbidity in Gulf waters. Turbidity levels in the western and northern Gulf are higher than the eastern Gulf because of more sources of freshwater input. Surface turbidity is limited to areas of riverine inputs with the Mississippi and Atchafalaya rivers the primary inputs for the Gulf. During low water periods, the amount of sediment in suspension averages 0.260 grams per liter (g/l). The amount of suspended sediment increases to 0.640 g/l during high water periods. These turbid waters are delivered to offshore locations by tidal currents and winds. Another type of turbidity found near the bottom is called the nepheloid layer. This is a body of moving, suspended sediment that is formed when the turbulence of bottom waters is high enough to offset the settling (gravity driven) of the sedimentary particles.

Currents vary with locality and may in some areas exceed 2 meters per second. Circulation patterns in the Gulf are dominated by the Loop Current that enters the Gulf through the Yucatan Straits and exits through the Straits of Florida after looping anticyclonically through the southeastern Gulf. During most years, the Loop Current penetrates north into the eastern Gulf. Associated with this penetration are the shedding of large anticyclonic eddies that propagate to the west after separation. Following an eddy shedding event, the Loop Current often retreats to the south, hugging the northwest coast of Cuba. The boundary of the Loop Current and its associated eddies is a dynamic zone with both strong convergences and divergences that can concentrate planktonic organisms including fish eggs and larvae.

7.1.3 Habitat Use by Managed Shrimp Species

The amended M-SFCMA of 1996 included new EFH requirements, and as such, each existing, and any new, FMPs must describe and identify EFH for the fishery, minimize to the extent practicable adverse effects of fishing on that EFH, and identify other actions to encourage the conservation and enhancement of that EFH. In 1999, a coalition of several environmental groups brought suit challenging the agency's approval of the EFH FMP amendments prepared by the Gulf of Mexico, Caribbean, New England, North Pacific, and Pacific Fishery Management Councils (American Oceans Campaign et al. v. Daley et al., Civil Action No. 99-982 (GK) (D.D.C. September 14, 2000). The court found that the agency's decisions on the EFH amendments were in accordance with the M-SFCMA, but held that the EA on the amendments were in violation of the NEPA and ordered NMFS to complete new, more thorough NEPA analyses for each EFH amendment in question. Consequently, NMFS entered into a Joint Stipulation with the plaintiff environmental organizations that called for each affected Council to complete EISs rather than EAs for the action of minimizing adverse effects of fishing to the extent practicable on EFH. See AOC v. Evans/Daley et al., Civil No. 99-982 (GK) (D.D.C. December 5, 2001). However, because the court did not limit its criticism of the EAs to only efforts to minimize adverse fishing effects on EFH, it was decided that the scope of these EISs should address all required EFH components as described in section 303 (a)(7) of the M-SFCMA.

To address these requirements the Council has, under a separate action, written an EIS to analyze within each fishery a range of potential alternatives to: (1) describe and identify EFH for the fishery; (2) identify other actions to encourage the conservation and enhancement of such EFH; and (3) identify measures to minimize to the extent practicable the adverse effects of fishing on such EFH (GMFMC, 2004a). Based on the preferred alternatives identified in this EIS, the Council finalized Generic Amendment Number 3 for Addressing the EFH Requirements of the FMPs of the Gulf of Mexico in March 2005. This amendment, currently under Secretarial Review, would implement the preferred alternatives in accordance with the EFH provisions of the M-SFCMA (See 50 CFR Part 600, Subpart J). The NMFS published the Notice of Availability (NOA) for the FEIS on June 25, 2004 (FR, Vol. 69, No. 122, p. 35598) and the NOA for the Record of Decision (ROD) on July 29, 2004 (FR, Vol. 69, No. 145, p. 45307). The Generic EFH EIS is incorporated here by reference. Additionally, the physical environment was previously described in the original Shrimp FMP and its associated EIS (GMFMC 1981), in the Generic EFH Amendment (GMFMC 1997), and in Amendment 9 to the Shrimp FMP with SEIS (GMFMC 1998). These documents are also incorporated here by reference.

In general, brown shrimp are found within the estuaries to offshore depths of 110 m throughout the Gulf; white shrimp inhabit estuaries and to depths of about 40 m offshore in the coastal area extending from Florida's Big Bend area through Texas; pink shrimp inhabit the Gulf coastal area from estuaries to depths of about 65 m offshore and is the dominant species off southern Florida. Brown and white shrimp are generally more abundant in the central and western Gulf, whereas pink shrimp are generally more abundant in the eastern Gulf. Royal red shrimp are not estuarine-dependent and spend their lives in depths of 100 to 300 fathoms. A more detailed description of shrimp and their relationships with their biological environment are presented in Section 7.2, herein.

7.1.4 Environmental Sites of Special Interest

Tortugas Shrimp Sanctuary - A shrimp nursery ground in the Florida Keys permanently closed to the use of trawls and harvest or possession of shrimp. This results in shrimp growing to about a 47 count/pound before harvest (3,652 square nautical miles).

Cooperative Texas Shrimp Closure - A shrimp nursery ground off Texas cooperatively closed by the Council and the state of Texas for typically 45 to 60 days out to either 15 or 200 miles. This closure results in shrimp growing to about 39 count/pound (5,475 square nautical miles).

Southwest Florida Seasonal Closure (Shrimp/Stone Crab) - Closure of federal and state waters to shrimping from November 1 through May 20 inshore of the line to protect juvenile stone crab and prevent loss of stone crab traps in trawls (4,051 square nautical miles).

Central Florida Shrimp/Stone Crab Separation Zones - Closure of state and federal waters to either shrimping or crabbing from October 5 to May 20. Crab or shrimp fishing alternate in Zones IV and V. (174 square nautical miles).

Longline/Buoy Gear Area Closure - Permanent closure to use of these gears for reef fish harvest inshore of 20 fathoms off the Florida shelf and inshore of 50 fathoms for the remainder of the Gulf (72,300 square nautical miles).
Florida Middle Grounds HAPC - Pristine coral area protected from use of any fishing gear interfacing with bottom (348 square nautical miles).

Madison/Swanson and Steamboat Lumps Marine Reserves - No-take marine reserves sited on gag spawning aggregation areas where all fishing, except seasonal trolling for highly migratory and coastal pelagic species is prohibited (219 square nautical miles).

Stressed Area - Permanent closure Gulf-wide of the nearshore waters to use of fish traps, power heads, and roller trawls (i.e., "rock hopper trawls") (48,400 square nautical miles).

Flower Garden Banks HAPC - Pristine coral area protected by preventing use of any gear that interacts with the bottom. Subsequently, this area was made a marine sanctuary by NOS (41 square nautical miles).

Tortugas North and South Marine Reserves - No-take marine reserves cooperatively implemented by the state of Florida, the National Ocean Service (NOS), the Council, and the National Park Service (185 square nautical miles).

7.2 Biological Environment

Brown, white, and pink shrimp use a variety of habitats as they grow from planktonic larvae to spawning adults (GMFMC 1981). A brief discussion of the biological environment and associated EFH of each species follows:

Brown Shrimp - Brown shrimp eggs are demersal and occur offshore. The larvae occur offshore and begin to migrate to estuaries as postlarvae. Postlarvae migrate through passes on flood tides at night mainly from February - April with a minor peak in the fall. Postlarvae and juveniles are common to highly abundant in all U.S. estuaries from Apalachicola Bay in the Florida panhandle to the Mexican border. In estuaries, brown shrimp postlarvae and juveniles are associated with shallow vegetated habitats but also are found over silty sand and non-vegetated mud bottoms. Postlarvae and juveniles have been collected in salinity ranging from zero to 70 ppt. The density of late postlarvae and juveniles is highest in marsh edge habitat and submerged vegetation, followed by tidal creeks, inner marsh, shallow open water and oyster reefs; in unvegetated areas muddy substrates seem to be preferred. Juveniles and sub-adults of brown shrimp occur from secondary estuarine channels out to the continental shelf but prefer shallow estuarine areas, particularly the soft, muddy areas associated with plant-water interfaces. Sub-adults migrate from estuaries at night on ebb tide on new and full moon. Abundance offshore correlates positively with turbidity and negatively with hypoxia. Adult brown shrimp occur in neritic Gulf waters (i.e., marine waters extending from mean low tide to the edge of the continental shelf) and are associated with silt, muddy sand, and sandy substrates. More detailed discussion on habitat associations of brown shrimp is provided in Nelson (1992) and Pattillo et al. (1997).

White Shrimp - White shrimp are offshore and estuarine dwellers and are pelagic or demersal, depending on life stage. The eggs are demersal and larval stages are planktonic; both occur in nearshore marine waters. Postlarvae migrate through passes mainly from May-November with peaks in June and September. Migration is in the upper two meters of the water column at night and at mid depths during the day. Postlarval white shrimp become benthic upon reaching the nursery areas of estuaries, where they seek shallow water with muddy-sand bottoms high in organic detritus or abundant marsh, and develop into juveniles. Juveniles are common to highly abundant in all Gulf estuaries from Texas to about the Suwannee River in Florida. Postlarvae and juveniles inhabit mostly mud or peat bottoms with large quantities of decaying organic matter or vegetative cover. Densities are usually highest in marsh edge and submerged aquatic vegetation, followed by marsh ponds and channels, inner marsh, and oyster reefs. Juveniles prefer lower salinity waters (less than 10 ppt), and frequently are found in tidal rivers and tributaries throughout their range. As juvenile white shrimp approach adulthood, they move from the estuaries to coastal areas where they mature and spawn. Migration from estuaries occurs in late August and September and appears to be related to size and environmental conditions (e.g., sharp temperature drops in fall and winter). Adult white shrimp are demersal and generally inhabit nearshore Gulf waters to

depths less than 30 m on bottoms of soft mud or silt. See Nelson (1992) and Pattillo et al. (1997) for more detailed information on habitat associations of white shrimp.

Pink Shrimp - Pink shrimp occupy a variety of habitats, depending on their life stage. Eggs and early planktonic larval stages occur in marine waters. Eggs are demersal, whereas larvae are planktonic until the postlarval stage when they become demersal. Postlarvae and juveniles of pink shrimp occur in estuarine waters of wide-ranging salinity (0 to >30 ppt) . Recruitment into estuaries occurs in spring and fall at night, primarily on flood tides, through passes or open shoreline. Juveniles inhabit almost every U.S. estuary in the Gulf but are most abundant in Florida. Juveniles are commonly found in estuarine areas with seagrass where they burrow into the substrate by day and emerge at night. Postlarvae, juvenile, and subadult may prefer coarse sand/shell/mud mixtures. Densities are highest in or near seagrasses, low in mangroves, and near zero or absent in marshes. Adults inhabit offshore marine waters with the highest concentrations in depths of 9 to 44 m. Preferred substrate of adults is coarse sand and shell with a mixture of less than 1% organic material. More detailed discussion of habitat associations of pink shrimp is provided in Nelson (1992) and Pattillo et al. (1997).

As indicated above, the three major species of shrimp in the Gulf (i.e., the brown, white and pink) are estuarine dependent. The estuaries along the Gulf coast formed during the past 5,000 years, when alluvial sediment supplied to the coast exceeded that removed through erosion and subsidence. The general physiography of the Gulf coast favored extensive wetland formation. Some 60 percent of the coastal wetland area of the conterminous U.S. occurs along the Gulf coast. Tidal marsh, mangroves, and submerged aquatic vegetation that comprise this area amount to some 6.2 million acres. An additional 8.4 million acres are classified as unvegetated estuarine open water (Crance, 1971; Perret et al., 1971; Chabreck, 1972; McNulty et al., 1972; Christmas, 1973; Diener, 1975). A state-by-state description of essential estuarine habitat is provided in Section 4.1.

Royal Red Shrimp - Royal red shrimp also are in the management unit of the shrimp FMP, but little is known of the species habitat requirements. The species is known to occur from Martha's Vineyard (Massachusetts) through the Gulf of Mexico and the Caribbean Sea to French Guiana where they live on the upper continental shelf at depths between about 180 and 730 m. Royal reds are scarce in less than 250 m and not abundant at depths greater than 500 m. The highest concentrations have been reported in the northeastern part of the Gulf of Mexico at depths between 250 and 475 m. The larvae are unknown. Commercial concentrations of royal red shrimp have been reported on the following types of bottoms: blue-black terrigenous silt and silty sand off the Mississippi River Delta; whitish, gritty, calcareous mud off the Dry Tortugas (GMFMC 1995). A habitat association table and distribution map are not available for royal red shrimp but will be provided in a future amendment when NMFS provides the requisite information.

While the quantitative relationships between the various estuarine habitats and shrimp production are not known, information is available on the kind of environment necessary for shrimp survival (Idyll et al., 1967). Tidal marsh, particularly smooth cordgrass (*Spartina alterniflora*), provides important habitat for juvenile brown shrimp (Zimmerman et al., 1984). Submerged vegetation likewise is important shrimp habitat. Costello et al. (1986) found early juvenile pink shrimp in

Florida Bay to be most abundant in shoal grass (*Halodule wrightii*) beds and less abundant in turtle grass (*Thalassia testudinum*). Turner (1977) observed that the yield of shrimp in Louisiana's estuaries is directly related to the acreage of marsh, while that from the northeastern Gulf of Mexico is directly related to the acreage of marsh and submerged grassbeds. He found no relationship between yields and estuarine water surface, average water depth, or volume. His findings concur with the observations of Barrett and Gillespie (1973) that annual brown shrimp production in Louisiana is correlated with the acreage of marsh with water above 10 ppt salinity, but not with acres of estuarine water above 10 ppt salinity. These findings suggest that the brown, white, and pink shrimp yields in the U.S. Gulf of Mexico depend on the survival of the estuarine marshes and grassbeds in their natural state. These areas not only provide postlarval, juvenile, and subadult shrimp with food and protection from predation, but they help to maintain an essential gradient between fresh and salt water.

The above focus on estuaries as essential habitat for shrimp does not imply that offshore (i.e., marine) habitat is any less important. The estuaries are emphasized because: (1) they are more vulnerable to degradation from a wider variety of human activities than is the marine environment (see Section 6.0), and (2) the estuarine phase of growth is considered the weakest link in the life cycle of shrimp.

Marine habitat also is critically important to the survival and reproduction of shrimp. Adult shrimp occur throughout the Gulf's marine habitat. White shrimp occur to depths of about 40 m, pink shrimp to about 65 m and browns to about 110 m. Species association generally occurs with bottom type. Within the Gulf there are three general offshore bottom type regions extending to the 200 m isobath. One occurs from the Texas-Mexico border to just west of the Texas-Louisiana border. Here the offshore zone consists mainly of sand and finer grain sediments. Occasional pockets of sand and shell are found from the 20 m to 200 m isobath. The second zone extends eastward to a point approximately even with Pascagoula Bay, Mississippi, and is mainly a complex of fine grain sediments with occasional surface deposits of sand and shell. The dominance of muddy bottoms in this zone is attributed to the deposition by the Mississippi River. The third region encompasses the remaining area offshore Alabama and Florida, which is almost exclusively comprised of sand, shell, and coral. Coral becomes more prevalent along the central and southern Florida coast.

The first two zones are primarily associated with brown and white shrimp, while the third zone is primarily associated with pink shrimp. These zones are all essential habitat for shrimp. More detailed description of these zones and other essential marine habitat components is found in Section 4.2.

Larvae of shrimp feed on phytoplankton and zooplankton. Postlarvae feed on epiphytes, phytoplankton, and detritus. Juveniles and adults prey on polychaetes, amphipods, and chironomid larvae but also on detritus and algae (Pattillo et al. 1997). The habitat of these prey is essentially the same as that required by shrimp (i.e., the estuarine and marine habitats described in Section 4.0).

7.3 Economic and Social Environment

7.3.1 Economic Environment

Section 5.4 contains a detailed description of the economic environment potentially affected by the measures in this amendment and is incorporated herein by reference.

7.3.2 Social Environment

7.3.2.1 Social and Community Profiles

When examining the Gulf shrimp fishery's social as opposed to economic environment, the focus of the discussion shifts primarily from vessels and firms to people and places (i.e. communities), though obviously vessels and firms are a part of those communities. At this time, there is very little detailed information on fishermen, fishing-dependent businesses, or communities that depend on the Gulf shrimp fishery. In order to understand the impact that any new rules and regulations will have on participants in the fishery, in-depth community profiles need to be developed that will aid in the description of communities involved in this fishery, both present and historical. Social science research is currently being conducted by NMFS in communities in the Gulf of Mexico. Part of this research is being conducted under contract with Impact Assessment, Inc. (IAI). The purpose of this phase of the research is to compile baseline information regarding communities in each Gulf state which are believed to have some level of association with marine fisheries. That is, based on a full range of descriptive information and analyses, IAI developed a basic typology of the study communities and their involvement with marine fisheries and related industries. The NMFS will eventually use this information to determine which communities are "fishing communities," as per the meaning of the term under National Standard 8. In general, "fishing communities" are communities which are "substantially dependent on or susbstantially engaged in" fishing or fishing related activities. At this time, the NMFS has only received the final report for Louisiana and, most recently, a draft of the report for west Florida. Only the Louisiana report will be referenced for current purposes. Until all of the research is completed, and in-depth community profiles are developed for some sample communities, it is not possible to fully describe the possible impacts of any change in federal fishing regulations in the federal Gulf shrimp fishery.

Nonetheless, it is possible to look at the geographic distribution of landings and revenues, vessels, primary permit owners,[24] dealers/wholesalers, and processors. Such information should be useful in gauging the fishery's importance to particular communities, and the importance of certain communities to the fishery. At least for Louisiana communities, some insights can be offered with respect to impacts on communities that are potentially "fishing communities," within the meaning of National Standard 8. Further, by comparing basic demographic information of communities associated with the Gulf shrimp fishery to national averages, it should be possible to discern whether any of these communities are socioeconomically disadvantaged, and thus whether impacts on them should be given special consideration, as per Executive Order 12898.

[24]"Primary" in this case means the individual or business to whom the permit was actually issued, even though there may be more than one owner.

7.3.2.2 Distribution of Federal Gulf Shrimp Permit Owners by Community

As can be seen in Table 6.1, permit owners are geographically distributed across 332 different communities. Though the vast majority reside in Gulf states, a fair number reside in many other states, ranging from the South and Mid-Atlantic States, and even the west coast of the U.S. The geographic distribution of permit and vessel ownership is important since, when federal regulations are imposed on permitted vessels which experience adverse impacts, it can generally be assumed that they will be most keenly felt in the communities with the largest number of permit owners. The data indicate that the Texas communities of Brownsville, Port Isabel, Palacios, and Port Arthur are home to more than 16% of the federal permit owners. Other Texas communities where permit ownership is relatively important are Freeport, Port Lavaca, and Aransas Pass. In Louisiana, permit ownership is prevalent in the communities of Cut Off, Chauvin, New Orleans, Houma, and Abbeville.[25] In Mississippi, Biloxi and Ocean Springs are the primary hubs of permit ownership. In Alabama, permit ownership is concentrated in Bayou La Batre. And in Florida, Ft. Myers Beach is clearly the dominant community with respect to permit ownership, particularly if Ft. Myers is included.

7.3.2.3 Distribution of Gulf Shrimp Dealers, Landings, and Sales by Community

The information presented in Table 6.2 regarding the distribution of food shrimp dealers, landings, and sales by community provides additional insights into the importance of the shrimp fishery to particular communities, and their importance to the fishery. Some of the communities that appear to be most important are similar to those with the greatest number of vessel permit owners. However, differences do exist. Some of these differences are likely because the distribution of permit owners only considers vessels that are permitted for the EEZ fishery, whereas the information in Table 6.2 pertains to all Gulf food shrimp landings, regardless of whether they came from federal or state waters. Specifically, in addition to the communities with concentrations of permit ownership, the communities of Dulac, Golden Meadow, Empire, Grand Isle, and Venice in Louisiana, Port Bolivar and Galveston in Texas, and Key West in Florida also appear to have very strong relationships with the Gulf shrimp fishery. Conversely, the association between the fishery and the Louisiana communities of Houma and New Orleans appear to be less strong by these standards. Such is the case even more so with Pt. Lavaca, Texas and Ocean Springs, Mississippi. These findings illustrate that fishing vessel owners do not always live where their product is being bought and sold.[26]

7.3.2.4 Distribution of Supplying Gulf Shrimp Vessels by Community

[25] According to IAI's research, New Orleans should likely not be considered a single community, but rather a "supra" community composed of several "sub-communities." This issue deserves further research.

[26] Note that the information in this table was compiled according to where the shrimp were bought and sold, which is oftentimes different from the port of landing (i.e. where the shrimp cross the dock) since product is often trucked from a port to a dealer that may be in a different community. For this analysis, vessel counts were not presented according to port of landing since, within the SLF, the "port" code is oftentimes a county or parish, which does not allow the analyst to determine the specific community where the vessel is docked.

Though shrimp sales and landings volume are potentially important indicators of a community's ties to the fishery, also of interest is the number of vessels that supply shrimp to dealers in each community. More so than volume and sales, number of vessels is indicative of how many fishermen and fishing households have a relationship with a particular community. This information is presented in Table 6.3. Note that, in this case, all known Gulf shrimp vessels are taken into account. In Table 6.4, only federally permitted Gulf shrimp vessels are considered. There are significant differences between the two, which in turn reflect differences between communities and their relationship with harvesters whose activities predominantly take place in the EEZ as opposed to state waters.

For example, when taking all vessels into account, communities in Louisiana occupy nine of the top ten spots within the ranking (Dulac, Golden Meadow, Grand Isle, Lafitte, Venice, Chauvin, Empire, Houma, and New Orleans) with only Port Arthur being the non-Louisiana community in that group. Conversely, when only looking at federally permitted vessels, four communities in both Texas (Port Arthur, Palacios, Brownsville, and Freeport) and Louisiana (Dulac, Abbeville, Grand Isle, and Golden Meadow) rank in the top ten, along with Ft. Myers Beach, Florida and Bayou La Batre, Alabama. In general, it is fairly clear that many communities in Louisiana have stronger ties to vessels that operate in state waters, while several communities in Texas are more closely aligned with federally permitted vessels. For example, Lafitte, Chauvin, Empire, Houma, and New Orleans have much stronger relationships with vessels that operate in state as opposed to federal waters, while the opposite is true for Port Arthur, Palacios, Bayou La Batre, Brownsville, Freeport, Biloxi, Sabine Pass, and Ft. Myers Beach.

7.3.2.5 Distribution of Gulf Shrimp Processors by Community

Because of the decline in the number of shrimp processors and the resulting fact that most communities only have one or two shrimp processors, and the "rule of three" which requires NMFS to protect businesses' confidential information, very little detailed information regarding processing activities can be revealed at the community level. Nonetheless, the ranking should provide some insights into approximately how important shrimp processing activities are to the 39 communities listed in Table 6.5. Some observations are worthy of noting.

First, the processors in Lakeland and Dover, Florida are obviously very important within the industry. However, given their inland locations and the fact that no domestic shrimp dealers are located in these communities, it is quite likely that these processors rely mostly if not entirely on imported product.[27] Most of the other communities appear to have a very strong or at least some relationship with domestic harvesters and dealer/wholesalers. Further, with the exceptions of processors in Dallas, Kemah, Seadrift, and Port O'Connor, Texas, and two additional processors in Saraland, Alabama and Panacea, Florida, the other processors and thus their communities rely heavily if not entirely on shrimp with respect to their processing activities. Again, how much of that shrimp comes from domestic production cannot be known with certainty, though Keithly et. al's (2005) analysis suggests a likely estimate of 60%. Communities that appear to have a very

[27] This hypothesis has in fact been confirmed by several industry representatives.

strong relationship with shrimp processing activities, though not nearly as much so with harvesting and wholesaling activities, would include Delcambre, Louisiana, Tampa, Florida, D'Iberville, Mississippi, and Bon Secour, Alabama. Undoubtedly, many of the processors in these communities receive product from nearby communities that have closer ties to harvesters and dealers. For example, recent field research suggests a strong relationship between dealer/wholesalers and vessel owners in Abbeville, Louisiana, who also have a strong relationship with vessels ported in Intracoastal City, Louisiana, with processors in Delcambre, Louisiana.

7.3.2.6 An Overall Assessment of Community Relationships with the Gulf Shrimp Fishery

Upon taking into account all of the presented placed-based information regarding the Gulf shrimp fishery, some ranking of communities according to the strength of their relationship with the fishery should be possible. Although this ranking is somewhat subjective, it does take into account all of the place-based factors that have been discussed, both in terms of how high each community ranked and how many factors for which it was highly ranked. Some emphasis has been placed on factors that are specific to the EEZ component of the fishery, and thus this ranking should be seen in this light. The rankings are presented in Table 6.6. It is worth noting that the top four ranked communities (Brownsville, Port Arthur, Port Isabel, and Palacios) are all in Texas.

7.3.2.7 Assessment of Community Resiliency

In addition to the place-based fishery data above, additional information can be gleaned by looking at the socio-demographic composition of these communities. As per Executive Order 12898, of specific interest are communities that have relatively high percentages of minorities, communities which are lower than average with respect to important socioeconomic factors, such as level of education, average household income, and poverty rates, and communities which have a relatively strong economic dependence on the fishing industry in general. These factors would be evaluated relative to national averages. For example, nationally, slightly more than 29% of the population is composed of minorities: Blacks/African Americans (12.3%), American Indians/Native Alaskans (0.9%), Asians (3.6%), and Hispanics/Latinos (12.5%). Average household income is $41,994 and 12.4% of the population lives in poverty. Over 80.4% of the population have a high school education or better, while 24.4% have a bachelor's degree or higher. This information generally comes from the Census Bureau (2000) but, in the case of some Louisiana communities, additional insights were gleaned from IAI's report (2004) regarding the identification of fishing communities. For current purposes, the focus is on the communities noted above that have the strongest relationship with the fishery.

Upon an analysis of the Census data for each community, many communities (24) appear to be relatively vulnerable to social and economic impacts as a result of adverse management changes, or adverse changes due to other factors. That is, these communities would find it more difficult to adjust to or "absorb" adverse impacts because, relative to other communities, they lack the

sufficient human, physical, and financial capital to do so. From a social justice perspective, the impacts of the Gulf shrimp fishery management changes on these communities should be given additional consideration. More specifically, the twenty-four communities can be subjectively broken into three groups: 1) communities which reflect all five of the attributes noted above (Group 1), 2) communities which indicate at least four of the attributes noted above (Group 2), and 3) communities that exhibit at least three of the attributes noted above (Group 3). Within each of those groups, there are seven, fifteen, and two communities, respectively. The identities of communities falling into each group are listed in Table 6.7 below. Communities in the first group would be the most vulnerable (i.e. least able to adapt), followed by those in the second and third groups, respectively. Note that, according to IAI's research, Dulac, Empire, Abbeville, Golden Meadow, Venice, Chauvin, Cameron, Montegut, Houma, and Delcambre, Louisiana were determined to be primarily involved with marine fisheries, while Boothville and Grand Isle, Louisiana were determined to be secondarily involved with marine fisheries. The specific attributes of each community are provided in the tables located in Appendix C.

7.4 Administrative Environment

7.4.1 Federal Fishery Management

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

Responsibility for federal fishery management decision-making is divided between the U.S. Secretary of Commerce and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary of Commerce (Secretary) is responsible for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the M-SFCMA, and with other applicable laws summarized in Section 9. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf of Mexico. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the states of Florida and Texas, and the three-mile seaward boundary of the states of Alabama, Mississippi, and Louisiana. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest coastline of 770 miles along its Gulf coast, followed by Louisiana (397 miles), Texas (361 miles), Alabama (53 miles), and Mississippi (44 miles).

The Council consists of seventeen voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. The public is also involved in the fishery management process

through participation at public meetings, on advisory panels (APs) and through council meetings that, with few exceptions for discussing personnel matters, are open to the public. The regulatory process is also in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations contained within FMPs are enforced through actions of the NOAA's Office of Law Enforcement, the USCG, and various state authorities. To better coordinate enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the M-SFCMA. These activities are being coordinated by the Council's Law Enforcement Advisory Panel and the Gulf States Marine Fisheries Commission's (GSMFC) Law Enforcement Committee have developed a 5-year "Gulf of Mexico Cooperative Law Enforcement Strategic Plan - 2005-2010."

7.4.2 State Fishery Management

The purpose of state representation at the council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries including enforcement of fishing regulations. Each of the five Gulf states exercises legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency listed below is the primary administrative body with respect to the states natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. More information about these agencies can be found in GMFMC (2004b) and from the following webpages:

Texas Parks & Wildlife Department - http://www.tpwd.state.tx.us
Louisiana Department of Wildlife and Fisheries - http://www.wlf.state.la.us/
Mississippi Department of Marine Resources - http://www.dmr.state.ms.us/
Alabama Department of Conservation and Natural Resources - http://www.dcnr.state.al.us/
Florida Fish and Wildlife Conservation Commission - http://www.floridaconservation.org/

8.0 ENVIRONMENTAL CONSEQUENCES

Environmental Effects of Alternatives and Their Significance

This section describes the potential direct, indirect, and cumulative effects on the physical, biological, socioeconomic, and administrative environments associated with each management alternative described in Section 4.0. The Council on Environmental Quality (CEQ) regulations (40 CFR 1508.8) define direct effects as those "which are caused by the action and occur at the same time and place." Indirect effects are defined as those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless

of what agency (federal or non_federal) or person undertakes such actions. Cumulative impacts could result from individually minor but collectively significant actions taking place over a period of time." Cumulative impacts are discussed in Section 8.7 and in the Finding of No Significant Impact (FONSI).

This amendment contains 11 separate actions that, in summary, address permitting issues in the shrimp fishery (Actions 1 and 10), designations of biological reference points (Actions 2, 3, 6, and 7), stock status criteria (Actions 4 and 5), and data collection efforts (Actions 8, 9, and 11). The actions are as follows:

Action 1: Alternatives to require a royal red shrimp vessel permit or an endorsement to the commercial shrimp vessel permit for vessels harvesting royal red shrimp in the Gulf EEZ; Action 2: MSY Alternatives for Royal Red Shrimp; Action 3: OY Alternatives for Royal Red Shrimp; Action 4: Overfishing Definition for Royal Red Shrimp; Action 5: Overfished Definition for Royal Red Shrimp; Action 6: MSY alternatives for Brown, White, and Pink Shrimp; Action 7: OY alternatives for Brown, White, and Pink Shrimp; Action 8: Alternatives to Establish Bycatch Reporting Methodologies and Improve Collection of Shrimping Effort Data in the EEZ; Action 9: Alternatives for completion of a Gulf Shrimp Vessel and Gear Characterization Form; Action 10: Alternatives to establish a commercial shrimp vessel permit moratorium; and Action 11: Alternatives for reporting of landings during the moratorium.

8.1 Direct and Indirect Effects on the Physical Environment

None of the actions proposed in this amendment should have any direct impact on the physical environment. The actions would not affect the way the fishery is currently conducted. The permit moratorium for the penaeid shrimp fishery may lead to some reduction in the number of vessels participating in the fishery, but there are no direct effort limitations being established, thus effort could increase, decrease, or remain the same with associated impacts to the physical environment. Any increase in effort would probably be offset by the probable reduction in the number of participating vessels. Consequently, any impacts from the moratorium are likely to be positive, albeit insignificant. There would also be no changes to the type of gear used that may positively or negatively affect any of the identified or functional aspects of the ecosystem. Data gathered through the proposed bycatch reporting methodologies may lead to additional management measures that would have impacts, most likely positive, on the physical environment, through reductions in effort or modifications to allowable bycatch reduction gear. However, any such impacts would result from future actions.

8.2 Direct and Indirect Effects on the Biological/Ecological Environment

A detailed assessment of the biological and ecological impacts of the management measures being considered in this amendment are presented immediately following each action in Section 4.0. As noted, the actions proposed in this amendment would not affect the way the fishery is currently conducted, nor lead to changes in the types of gear used in the fisheries. Thus, there would be no direct biological impacts from any of the actions. Actions 8, 9, and 11 could potentially provide better information on bycatch, vessels, gear, and landings that could have positive indirect

biological impacts in the future because better information could result in more informed management decisions.

The actions would have no effect on flood plains, rivers, creeks, or other streams and tributaries to the marine environment or their associated wetlands that are important components of the ecology for penaeid shrimp because no actions are proposed in these areas. With no changes in the way the fishery is conducted, the actions would have no effect on EFH. Effects on EFH would only ensue if the establishment of these actions created the need for future management measures or changed the existing operations of the shrimping fleet. Such impacts could be positive or negative, but would most likely be positive, given that the actions are intended to provide more precise information about catch and bycatch in the fishery. Therefore, any future actions or changes in activities would probably result in a reduction in the amount of fishing time and thus any impacts of trawling on the physical and biological environment would be reduced.

Establishing biological reference points (Actions 2, 3, 6, and 7), and stock status criteria (Actions 4 and 5) are not anticipated to have biological or ecological impacts. Impacts from these actions for the royal red shrimp fishery (Actions 2, 3, 4, and 5) would occur only if the fishery expanded in the future. Impacts to the penaeid shrimp fishery would only occur if the stocks were reduced below the parent stock sizes (basis for establishing yields) identified for each species, and the stock was determined to be overfished or undergoing overfishing. As discussed in Section 4.0 none of these scenarios are likely given the current conditions in both the royal red and penaeid shrimp fisheries.

8.3 Direct and Indirect Effects on the Economic Environment

A detailed assessment of the economic impacts of the management measures being considered in this amendment are presented in Section 5.5. A summary of those impacts is presented in Section 4.0 with the discussion of each of the actions and alternatives, and is incorporated here by reference. In summary, establishing a separate royal red shrimp vessel permit or an endorsement to the commercial shrimp vessel permit for vessels harvesting royal red shrimp in the Gulf EEZ (Action 1) would have minimal economic impacts due to the additional application cost of $20. Vessels participating in the royal red shrimp fishery are already required to have a federal shrimp vessel permit.

Establishing biological reference points (Actions 2, 3, 6, and 7), and stock status criteria (Actions 4 and 5) are not anticipated to have economic impacts. Impacts to the royal red shrimp fishery would occur only if the fishery expanded in the future. For the penaeid shrimp fishery, the establishment of MSY and OY targets, based on a yields associated with maintaining a sufficient parent stock (proxy for Bmsy) would not have any impacts on the fishery unless the harvests led to a reduction in parent stocks to the point the fishery was determined to be overfished or undergoing overfishing.

Establishing a commercial shrimp vessel permit moratorium (Action 10) should help to address both a long-term problem and a short-term problem in the fishery. Though the specific magnitude of the impacts depends on the alternative selected, which establishes the time frame for eligibility, some vessels currently participating in the fishery may be excluded from continued participation.

However, under all the alternatives, these individuals would still have the opportunity to purchase a permit from individuals who are willing to sell. Given the relatively large number of "latent" permit holders, many permits should be available for sale at a relatively reasonable price ($5,000 on average). Allowing the permits to become transferable would eliminate or at least significantly reduce the existing economic uncertainty in the market, thereby encouraging efficient business exchanges.

To collect better effort, catch and bycatch information, the Council considered options, in various combinations, that would include logbooks (paper, electronic, or both) and observers (Action 8), as well as requiring fishermen to submit information on their vessels and the types of gear used (Action 9), and their landings (Action 11). All hinge on direct involvement and participation by the fishermen, thus these actions are expected to directly affect the economic environment. The requirement for fishermen to annually complete a vessel and gear characterization form (Action 9) could be included with the permit application form, and could be returned at the same time, thereby minimizing any expense associated with mailing of the form. The only economic cost associated with the form would be the limited 30-minute time burden associated with its completion. Having more accurate information regarding the catch, effort, and bycatch in the fishery (Action 8) in smaller time and spatial periods would benefit the management process in developing a more appropriate management strategy. If so, the costs of management would be reduced, and thus the burden on taxpayers and the fishermen would be reduced as well. If fishery regulations were stable for a longer period of time, that would constitute an important benefit to an industry that is already beset by various sources of instability and the resulting economic uncertainty. From an economic perspective, even though there is no direct cash expense from a paper logbook program, there is an opportunity cost associated with any time burden created by additional reporting requirements. However, the Council's preferred alternative is to not require paper logbooks at any level of coverage. Instead, it has chosen to require ELBs for a sample of the permitted vessels. However, the cost of purchasing the ELB units and managing the program will not be borne by the industry. Similarly, observer programs are inherently expensive for NMFS to operate, and would be a burden on the taxpayer. In addition, even if the coverage and funding issues can be resolved, there are potentially other economic impacts to be considered; having an observer on-board generates liability concerns and costs for vessel owners if they do not presently have liability insurance and decide to purchase it. Nevertheless, numerous Gulf shrimp fishermen have expressed a desire to be a part of the research process, show people how they work, and demonstrate their knowledge. Fishermen claim that they are frequently ignored by scientists and managers, who fishermen believe should spend more time on the water. Vessel owners would already have landing information at their disposal and many would already be reporting it to various programs, the cost of providing and certifying the landings as proposed in Action 11, should be minimal. The proposed action would alleviate issues associated with the lack of appropriate trip ticket programs in Mississippi and Texas, in conjunction with current data management practices within NMFS, which makes it difficult to determine which vessels are and are not active in the fishery, as well as the nature and level of that activity, with certainty.

8.4 Direct and Indirect Effects on the Social Environment

Mandates to conduct Social Impact Assessments (SIA) come from both the NEPA and the M-SFCMA. The NEPA requires Federal agencies to consider the interactions of natural and human environments by using a "systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences...in planning and decision-making" (NEPA, Section 102 [2] [a]). Under the Council on Environmental Quality's Regulations (CEQ, 1986) for Implementing the Procedural Provisions of the NEPA, a clarification of the terms "human environment" expanded the interpretation to include the relationship of people with their natural and physical environment (40 CFR 1508.14). Moreover, agencies need to address the aesthetic, historic, cultural, economic, social, or health effects which may be direct, indirect, or cumulative (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment, 1994).

Under the M-SFCMA, fishery management plans (FMPs) must "...achieve and maintain, on a continuing basis, the optimum yield from each fishery" (M-SFCMA, Section 2 [b] [4]). Recent amendments to the M-SFCMA require that FMPs address the impacts of any management measures on the participants in the affected fishery and those participants in other fisheries that may be affected directly or indirectly through the inclusion of a fishery impact statement (M-SFCMA, Section 303 [a] [9]). Most recently, with the addition of National Standard 8, conservation and management measures must now, consistent with conservation requirements, take into account the importance of fishery resources to fishing communities to provide for their sustained participation and minimize adverse economic impacts upon those communities to the extent practicable (M-SFCMA, Section 301 [a] [8]). Consideration of social impacts is a growing concern as fisheries experience increased participation and/or declines in stocks. With an increasing need for management action, the consequences of such changes need to be examined to mitigate the negative impacts experienced by the populations concerned.

Social impacts are generally the consequences to human populations that follow from some type of public or private action. Those consequences may include alterations to "the ways in which people live, work or play, relate to one another, organize to meet their needs and generally cope as members of a society...." (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment, 1994:1). In addition, included under this interpretation are cultural impacts that may involve changes in values and beliefs which affect people's way of identifying themselves within their occupation, communities, and society in general. Social impact analyses help determine the consequences of policy action in advance by comparing the status quo with the projected impacts. Therefore, it is extremely important that as much information as possible concerning a fishery and its participants be gathered for an assessment. Although public hearings and scoping meetings do provide input from those concerned with a particular action, they do not constitute a full overview of the fishery.

Without access to relevant information for conducting social impact analyses, it is important to identify any foreseeable adverse effects on the human environment. With quantitative data often lacking, qualitative data can be used to provide a rough estimate of some impacts. In addition, when there is a body of empirical findings available from the social science literature, it needs to be summarized and referenced in the analyses.

In attempting to assess the social impacts of the proposed amendment, it must be noted that data available for these analyses still do not represent a comprehensive overview of the fishery; therefore, analyses do not include all social impacts. The available information is what was presented above and pertains primarily to the commercial harvesting sector, dealers/wholesalers, and processors in the Gulf shrimp fishery, along with some information about the communities with which they are associated. Thus, social impacts on non-commercial harvesters, the processing sector, the consumer, fishing communities, and society as a whole are not fully addressed due to data limitations.

With respect to Action 1, to potentially establish a separate permit (Alternative 1.B) or an endorsement requirement (Preferred Alternative 1.C) for the royal red shrimp fishery, if the separate royal red shrimp permit can be obtained at the same time and with the same application process as is in place for the shrimp vessel permit, which is the current expectation, there would be few social costs imposed on vessel owners or operators. However, the additional cost of $20 per application form could be seen as unduly burdensome since all of the participants already pay $50 for the Gulf shrimp permit. Some fishermen may also participate in the South Atlantic rock shrimp or penaeid shrimp fisheries and thus, given the impending permit requirement in the latter, they would have to pay for all of these permits. Given that these vessels are all large and thus likely migratory, this scenario is somewhat likely. Some fishermen resent having to pay for permits at all, and that resentment is greater under the current economic climate, and possibly even greater yet for these particular fishermen given the additional expenses they must incur to participate in this fishery. Further, given that the Council's preferred alternative is to require an endorsement to the current Gulf shrimp permits, if fishermen are confused by this term and its meaning, that would heighten their frustration with the permit application process. If, as discussed in the RIR, there is little additional information to be gained from an additional permit or endorsement requirement at this time, then the perceived social costs would be greater still since fishermen would feel that the burden, no matter how small in terms of time and out of pocket expense, was unnecessary. On the other hand, for current fishery participants, an important social benefit from selecting the endorsement alternative is that vessels that do not qualify under Action 10, or obtain a Gulf shrimp permit once they become transferable, would not be able to enter the fishery, increase competition, and thereby dissipate economic benefits. This outcome should enhance economic and social stability in the fishery.

On the other hand, in discussions with some of the fishery participants (Travis 2004), there would be greater support for a separate permit or endorsement requirement if there was evidence that the stock was in trouble and/or participation and effort increased in a short period of time. That is, current participants would want to protect the resource and the economic health of the fishery if it were necessary. Neither of those conditions are being met at this time. However, in the future, if the quota of 392,000 pounds was increased, economic conditions in the fishery improved and/or the costs of participating in the royal red shrimp fishery were to decrease, vessel participation increased, and vessels could potentially specialize solely on royal red shrimp landings without any reliance on penaeid shrimp landings from the EEZ, then the benefits from such an additional permit would be higher, and support from the fishermen would likely be greater as well, since the need for information specific to their activities would be greater.

With respect to Actions 2 through 7, which deal with specifying definitions for MSY and OY in the royal red shrimp fishery and penaeid shrimp fisheries as well as overfished and overfishing definitions for royal red shrimp, such specifications do not directly affect resource use. Therefore, regardless of which alternatives are selected, they would have no direct effects on existing fisheries and communities. Direct effects associated with resource use would only accrue as a result of subsequent management action in response to an evaluation of the fishery with regard to these benchmarks. With no direct change in the use of the resource by individuals or communities, there would be no behavioral changes by these individuals or communities, therefore, no indirect affects attributed to such change in general. These definitions are statutory requirements of an FMP, and their establishment would provide public satisfaction by recognizing that the Council is effectively managing the resource.

However, as discussed in the RIR, because of the existence of a quota in the royal red shrimp fishery, the choice of the lowest or highest estimate of MSY for royal red shrimp, as is the case with Alternative 2.C or Preferred Alternative 2.B, respectively, could impose social costs if the current royal red shrimp fishery were to expand. Although landings have never exceeded the lower alternative for MSY, adverse social impacts could occur if the fishery were to expand due to additional effort by vessels that are in the fishery or from new entrants. If Alternative 2.C is the proposed alternative, and landings were to exceed the 392,000 pound quota, the Council or NMFS could take action to limit or reduce landings. At the least, they would be required to shut down the fishery once the quota was exceeded. If experience in other fisheries can be used as an indicator, once vessel participation and effort reaches the point where the quota is likely to be reached before the season's end, derby fishing conditions are likely to occur, which are known to adversely impact all fishery participants via market gluts and the resulting price decreases. Further, if the expansion was due to the establishment of new or expanded markets, such action would negatively impact the production, buying, distribution, and consumer sectors.

Under Preferred Alternative 2.A or particularly Alternative 2.B, negative social impacts are potentially less because they may allow harvests to levels nearly two times the highest recorded catch in a given season. Additionally, there would likely be positive social impacts if the fishery were to expand through the development of new or expanded markets and the generation of new or increased income for producers and sellers while providing additional product to consumers. However, this result is completely dependent on whether the Council or NMFS increases the quota to match the change in MSY. That is, these social benefits could only be created if, in a separate action either now or in the future, the Council or NMFS was to increase the quota above its current 392,000-pound level. Such an action is not presently considered within this amendment, and thus the hypothesized social benefits would only potentially occur in the future. In any case, for reasons previously cited (i.e. costs of entry, limited markets, current adverse economic climate, etc.), it is unlikely that this fishery will expand in the near future, which likely renders both the discussed social costs and benefits moot.

As with the MSY alternatives discussed above for royal red shrimp, under Action 3, the choice of the most conservative alternative (Alternative 3.C with a 392,000-pound OY) or the least conservative alternatives (Alternative 3.A or Preferred Alternative 3.B) for OY would only cause adverse social impacts if the current fishery were to expand in terms of vessel participation or level

of effort. Given the current economic climate within the Gulf shrimp fishery and the additional costs and risks associated with participating in the royal red shrimp fishery, such an expansion is unlikely which, at least in the short-term, renders discussion of economic costs and benefits from this action moot.

Further, certain alternatives may cause indirect impacts on the fishermen and their communities should it be determined in the future that lower allowable catch levels are required to meet more conservative definitions of the SFA parameters. In other words, if the selection of a particular specification increases the probability of restrictive management measures being implemented in the future, this could be considered an adverse, indirect social impact as it heightens fishermen's anxieties regarding an already uncertain future. This is potentially the case with Alternatives 3.C and 3.D, Alternative 5.A in particular but also Alternative 5.B, Preferred Alternative 6.B, and Alternatives 7.C and 7.D.

It should be noted that such SFA parameters – their definition and methods for determining criteria – are concepts not well understood by the public at large. As such, the simple discussion of such scientific parameters has the effect of confusing some sectors of both the fishing and non-fishing public. This confusion is often linked to further dissatisfaction by the public of fishery management and managers, having a negative impact on the amount of confidence the public has in government officials. This situation of confusion and dissatisfaction is likely even greater for participants in the Gulf shrimp fishery. Given that shrimp are an annual crop, at least with respect to penaeid species, and their availability is predominantly determined by environmental factors as opposed to fishing mortality, many industry participants have expressed the opinion that the concepts of overfishing and overfished stocks are not applicable to their fishery. These fishermen have expressed frustration over having to meet a legal requirement that seems more designed to address concerns with longer-lived species. Again, their concern is heightened due to fears that, somewhere down the road, the establishment of these parameters could potentially lead to management changes that would have adverse impacts on them.

With respect to the alternatives under Action 8, the purpose of this action is to determine which methods for assessing bycatch are the most expeditious and efficient in order to address potential bycatch concerns. Each method has certain potential positive and negative impacts associated with it. In the final analysis, a combination of these programs likely has the best potential to offer a wealth of information and the opportunity for data triangulation.

While observer programs are an intrusive data collection system, and considered an invasion of privacy by some fishermen, according to K. Kitner (personal communication), a majority of South Atlantic shrimp fishermen interviewed in the past four years have expressed a desire to have observers on their boats. At various meetings in the Gulf over the past year, numerous Gulf shrimp fishermen have expressed a similar desire. They want to be a part of the research process, show people how they work, and demonstrate their knowledge. Fishermen claim that they are frequently ignored by scientists and managers, who fishermen believe should spend more time on the water. However, an observer program, to be successful, should be sensitive to cultural traditions, as well as the type and size of the vessel. For example, it will likely be more difficult for small vessels to carry an extra person onboard, and some allowance should be made for such

situations. Some fishermen may be resentful if an observer program is mandatory. Some of this animosity may be lessened since fishermen will not have to cover the costs of the program, and if the observers are well trained, have experience on sea-going vessels, get along with fishermen, and are not perceived as a burden. An observer program may also be more accepted if it meant less burden with respect to other data collection programs. For example, if the presence of observers meant that less information had to be collected via a paper logbook, or if fewer fishermen had to fill out paper logbooks or carry an electronic logbook, the observer program might be better received by the industry. A well designed training program for both observers and fishermen would enhance the success of an observer program. It would also enhance data collection in general. Observers could also be trained to gather basic social and economic data and expand the knowledge of this important aspect of fisheries. Outreach and training programs could engender better working relationships between fishermen and fishery managers.

In addition to observer data, Options 2 and 3 under Alternatives 8.A and 8.B could require the use of paper logbooks and/or electronic logbooks to collect effort that would then be used to estimate bycatch and other important measures. There is a probability that at least some, possibly many, captains and crew would not want to participate in logbook programs, particularly paper logbooks, which would impose a much greater time burden on them relative to ELBs and could thus interfere with onboard operations of the vessel. Their concern is that this information could somehow be leaked out to others, who would then use it to their benefit, which would in turn reduce the information's usefulness. This burden could result in animosity toward fishery managers which could in turn result in the inaccurate reporting of fishing effort and related data. The same concern arises with observers. Though less burdensome, ELBs could also be perceived as an invasion of privacy, though they would not be subject to intentional mis-reporting of data as paper logbooks would be. However, outreach and training may lessen this problem. Also, if fishermen could be reasonably assured of the data's confidentiality, their animosity might be reduced. Only requiring the logbooks from a sample of vessels rather than all permitted vessels could also reduce the burden. Though, on the other hand, sampling can also generate concerns about equitable sharing of the burden across fishery participants. Whether paper logbooks, ELBs, or observers, individual fishermen do not like to be selected repeatedly and, as a result, feel like they are being singled out or carrying the burden on behalf of their peers. Thus, it will be important to re-draw the selected sample of vessels facing such requirements on a regular basis (e.g. annually).

Even if fishermen are willing to participate in a paper logbook program, they may not possess the correct information when they fill out logbooks. Fieldwork observations and interviews have shown that many fishermen that are currently required to fill out logbooks do so after they return from fishing, or have the fish house fill out the logbook for them. This practice can lead to poor data collection. Again, this problem could be overcome with ELBs that would automatically collect effort information including vessel location, date, speed, etc..

While a combination of paper logbook, electronic logbook, and observer programs may appear to be optimal with respect to collecting all the necessary information with the least burden on the industry, there is a potential for problems with data-sharing, data compatibility, and continuity in research programs that may impair assessment efforts. Furthermore, given that NMFS would incur the financial costs of implementing any/all of these programs, the availability of sufficient

funding to run these programs at levels that would ensure the collection of adequate data is a concern.

The No Action alternatives would only consider data that currently exists and might not generate any direct social impact to the shrimp fishery with respect to collecting information on effort and bycatch. However, there are few data available on bycatch and there are serious concerns regarding the accuracy and representativeness of the available effort data. The No Action alternatives could be detrimental to the fishery, and may not comply with the requirement of the M-SFCMA to have a standardized bycatch reporting methodology. Should there be doubt about the health of a bycatch fishery or species, the damage shrimp trawling may be inflicting on other species or habitat, the Council and NMFS would likely adopt a precautionary approach. It is conceivable that better data would allow for less onerous restrictions on the fishery, which may have more significant social impacts. In other words, under the No Action alternatives, because no new information would be collected, and management decisions would be based on information that might not be applicable to the fishery, more restrictive regulations to reduce bycatch mortality may need to be introduced, which would impose a social cost of currently unknown magnitude. Given the above information, it would appear that the Council's preferred alternatives of not requiring paper logbooks at any level of coverage, but requiring ELBs and observers for a sample of the permitted vessels, is the combination of alternatives that will minimize the social impacts of Action 8 while still meeting the Council's objectives and legal mandates.

With respect to Action 9, wherein a vessel and gear characterization form might be required, the social costs associated with Preferred Alternative 9.B are minimal, and only result from the time burden and resulting inconvenience. However, in combination with the other existing and proposed reporting requirements, some fishermen could feel overly burdened. The fact that this form is only to be filled out once a year should mitigate that feeling. Only requiring the form for a sample of vessels (Alternative 9.C) could reduce that burden, but would also defeat the form's primary purpose, which is that the data be used to develop good sampling designs for the other data collection programs which would in turn ensure that data representative of the fishery is being collected. Further, how these various data collection programs fit together needs to be explained to the fishermen in order to alleviate some of their concerns.

The same argument can be made with respect to Action 11, wherein fishermen would be required to report their shrimp landings to NMFS. As noted previously, there are important concerns with the accuracy of landings data at the vessel level within current data collection programs. While changes may be made to those programs at some point in the future, the problems will remain until those changes are made. Most importantly, these problems currently prevent a completely accurate accounting of which vessels are actually participating in the fishery at this time and the level of such participation. Should the Council begin to consider alternative long-term effort management programs in the future and this information is still in question, poor decisions could be made that would create unnecessary hardship, particularly for permit holders that are actually participating in the fishery, or participating at a particular level, but current data sources do not reflect that participation. In such a scenario, social costs could be extreme.

Finally, with respect to Action 10, alternatives for a permit moratorium, this action has the potential to create the greatest social costs, but also the greatest social benefits, depending partly on which alternative is selected. There is a need to temporarily address the issue of participation in the fishery until a long-term effort management program can be developed and implemented if such is deemed to be needed. Participants in the shrimp fishery are experiencing economic hardship primarily related to depressed prices and high fuel costs. Particularly as a result of the significantly reduced prices, and the value of shrimp resources in the Gulf has decreased. As a result, the fishery cannot support as many participants as it has historically. Anecdotal evidence indicates that many vessels, particularly larger vessels, have gone into bankruptcy and been subsequently repossessed, which in turn has caused significant disruption with respect to social and business relationships, both within and between communities associated with the fishery. Under the current assumption that external factors such as imports, fuel prices, and other costs remain unchanged from their 2002 status, economic projections currently predict a decrease in effort as a result of the continuing exit of vessels through the year 2012. Thus, the social and economic disruptions in the communities most strongly associated with the fishery are expected to continue for some time.

The Council may consider long-term effort management programs in the future depending on the current trend in exodus from the fishery. The immediate problem, however, is the potential for new vessels to enter the fishery by obtaining federal permits, which could reduce the benefits of a long-term effort management program in general and particularly to current participants. Under the current economic conditions, the vast majority of new entry would likely be purely speculative. Increases in the number of active participants in the fishery would not be sustainable under the current economic conditions. However, the global market is unpredictable and the potential exists for external factors to improve long-term market conditions (i.e. shrimp and fuel prices). Even with improved economic conditions, any increased active participation in the fishery would cause the already reduced size of the "economic pie" to be shared with more vessels/people, thereby leaving smaller pieces of that pie for current participants and slowing down the industry's economic recovery. Under such circumstances, the probability of social conflict within the industry would increase, perhaps dramatically. There is some anecdotal evidence that such conflicts are and have been occurring as participants scramble to protect their "piece of the pie."

Furthermore, current fishery participants have been exerting considerable effort to improve their economic condition through a variety of approaches, including attempts to improve product quality via a product certification program and several aggressive marketing campaigns. Should those efforts be successful, the demand and thus the prices for domestic, wild shrimp would increase. The same result may occur if industry participants are successful in their attempts to have tariffs imposed on farmed, foreign shrimp, which they assert have been "dumped" into the U.S. market. The point is that, from their perspective, since they have been the ones to go through the hardships and expend the resources in an attempt to reverse the industry's economic fortunes, then, under any reasonable concept of what is equitable, they should be the ones to benefit from their efforts. Simply put, the issue is one of fairness.

At present, since the shrimp permit is an open access permit and thus can be obtained by anyone, assuming the proper paperwork and fee are submitted, permits are not currently transferable.

However, current fishery participants should be aware that the Council established a control date of December 6, 2003. The establishment of the control date was a signal to fishermen that, should they desire to continue to participate in the fishery, they needed to obtain a permit by that date or face the possibility that they would not be allowed to participate should the Council decide to implement a limited entry or other form of effort management program in the future.

Furthermore, many are also aware that a permit moratorium is an action currently being considered within this amendment, and that multiple alternatives are also being considered under that action; alternatives that will have different implications for their livelihoods depending on when and whether they have already obtained a permit. Many fishermen have expressed apprehension regarding establishment of the control date because, in other fisheries, this has generally meant that a limited entry system will be implemented in the near future. "Limited entry" is a term that some fishermen strongly dislike, because they see it as a means for government to kick people out of the fishery, and thereby take their livelihoods away. The potential for strong resistance from industry participants increases if they believe that the criteria for continued participation are arbitrary or unfair, which of course has everything to do with how those criteria would affect their individual ability to continue operating in the fishery. For some though, it is not just about their continued participation, but allowing their family, friends, and colleagues to also continue earning a livelihood in the fishery. This is a particular concern for families that have participated in the fishery for multiple generations. It is also a strong concern for vertically integrated business that are involved in the harvesting, wholesale, and processing sectors since disruptions in the former can lead to disruptions in the latter two components of the operation.

At present, the combination of the control date and the non-transferability of current permits has created a problematic situation for many current Gulf shrimp vessel owners, and those who desire to become owners of current Gulf shrimp vessels. In general, these two groups of individuals are caught in a business decision paradox. Many vessel owners apparently have a desire to sell their vessels, which is to be expected under the current economic conditions. While the demand for such vessels may not be considerable, anecdotal information suggests that such demand exists, nonetheless. Since permits are not transferable with the sale of the vessel under the current system, a new owner must obtain a new permit. While that is allowable, the new permit would be assigned an effective date associated with the time of the new owner's application, <u>not</u> the date of the original owner's permit. Therefore, although the original owner's permit may have been dated prior to the control date, at this time, a new owner's permit would have an effective date beyond the control date. At present and until the Council acts, it is uncertain whether the new owner would be given a permit under a potential moratorium. If the previous vessel owner did not have a vessel permit, or at least not one dated prior to the control date, then the potential new owner's future in the fishery is even more uncertain. Prudent businessmen understand that purchasing a vessel under such circumstances would be financially risky and thus they are hesitant to engage in such transactions. For current vessel owners, the situation prevents them from changing their livelihoods when they in fact desire to do so. Therefore, they must continue to operate their vessels or tie them up. In either case, they are likely to continue losing money since certain expenses, such as boat payments, insurance, mooring fees, etc, must be paid regardless of whether their vessels are active or not. In other words, current vessel owners who want to sell their vessels and change the way in which they earn their livelihood are under considerable stress and feel like

the government has put them in this predicament, just as potential vessel owners feel that the government is responsible for creating an uncertain business climate. In short, the current system is creating considerable business uncertainty and thus social stress for current and potentially new vessel owners, which they feel is unnecessary, unfair, and for which they blame the government.

So, in sum, the moratorium should help to address both a long-term problem and a short-term problem and thereby reduce social disruptions. The short-term problem is the box that existing and potential new shrimp vessel owners are in as a result of: 1) the control date being established, 2) that date is already past, 3) current permits are not transferable with their vessels, and 4) the effective date on any new permits would be past the announced control date. Allowing the permits to become transferable would eliminate or at least significantly reduce the stress and social disruptions arising from the current system. In the long-term, the problem has two components. First, for an assortment of reasons, additional vessel owners may decide to obtain a permit for speculative purposes. Should they become active in the fishery, their participation would add to the industry's existing economic woes and thereby create additional social conflict within the fishery. Further, the inclusion of additional vessels would complicate the creation of a long-term effort management program, dissipate the benefits from such a program, and redistribute those benefits from current to new fishery participants. If the Council is going to consider such a program, controversiality should be reduced if the group of affected people is limited to those who have already been participating in the fishery as opposed to including "outsiders" and "Johnny Come Latelys" who have not "paid their dues" in the view of current participants. Again, the issue is one of fairness. By capping participation to current participants, the moratorium should mitigate such conflicts in the future. However, it should be kept in mind that some fishermen, even under the current social and economic duress, still believe in the philosophy that the fishery should be open to any and all who wish to participate, a philosophy that has a long history among fishermen, particularly shrimpers. On the other hand, as economic conditions have worsened and current participants have had to expend considerable resources to improve their economic fortunes, it appears that this philosophy is waning in popularity.

The RIR has already discussed in detail the expected economic impacts of the alternatives at the vessel/firm level. Thus, in this section, the focus shifts to impacts at the community level, particularly with respect to how many vessels and dealers/wholesalers in each community will be affected, and the magnitude of those impacts with respect to increases in costs, losses in revenues (absolutely and relatively), and potential employment losses. In general, employment losses are dependent on how many of the vessels that supply shrimp to each community would be excluded under each alternative. Losses in revenue will indicate the relative distribution of expected income losses across communities. The greater these types of losses in each community, the greater will be the adverse social impacts. However, as noted previously, if those impacts are expected to take place in less resilient or more dependent communities, then their severity will be amplified.

Since permits would be transferable under all but the No Action alternative (Alternative 10.A), those who might not be issued a moratorium permit would at least have the opportunity to purchase a permit from someone who desires to sell one. According to the RIR., although it is not possible to know exactly how much such permits might cost, since the market does not yet exist, it is possible that the price of permits will be slightly greater under Alternative 10.D than under

Preferred Alternative 10.B, which in turn may be slightly greater than under Alternative 10.C (i.e. permit price may be lowest under Alternative 10.C). If permit prices are in fact higher under Alternative 10.D than Alternative 10.C and Preferred Alternative 10.B, then, for those who do not initially receive a moratorium permit, the associated levels of resentment and apprehension will be highest under that alternative as well. However, also as noted in the RIR, this conclusion must be qualified by the possibility that, of the vessels that did not have permits in calendar year 2005 and which are assumed to not qualify for a moratorium permit under Alternative 10.D, some or all of those vessels may yet renew their permits and others may obtain new permits prior to the publication date of the final rule that will implement this amendment. Should all of those vessels renew their permits prior to that date and/or if new permits are issued, then Alternative 10.D would yield the lowest demand, the greatest supply, and therefore the lowest permit price since none of the known 2,951 vessels that have had permits would be excluded. At this time, it is not possible to determine how many vessels will actually renew or obtain permits before the final rule's publication.

As explained in the RIR, even though it is not possible to forecast the permit purchase price under the various alternatives with a high degree of certainty, existing information and theory suggests that the best estimate is likely around $5,000 per permit. At least some of those who will be put in the position of purchasing a permit may resent and be apprehensive of the fact that, in order to participate in the fishery, they will have to find someone who is willing to sell their permit at a price they can afford. Thus, to a large degree, their continued participation will be dependent on the desires of those people who have permits and thus would be uncertain in the short-term. Further, their lack of experience with such situations will be an additional source of trepidation.

As noted in the economic analysis, the ability of the owners of non-qualifying vessels to purchase permits under the moratorium will likely mitigate the severity of the impacts at the community level. From the perspective of community impacts, it is important to keep in mind that, the greater the geographic dispersion of vessel owners that need to purchase permits, the less will be the impacts in any single community which would arise from the costs of purchasing those permits. Thus, for example, under Preferred Alternative 10.B, assume that the owners of all non-qualifying vessels that were active in the EEZ need to buy a permit in order to continue current operations. Thus, 72 permits would need to be purchased. The data indicate that these vessel owners are dispersed across 45 different communities. Thus, on average, less than 2 owners per community would need to purchase a permit, implying that the average cost per community would be around $8,000, which is fairly minimal at the community level. The data also suggests that there are no high levels of owner concentration in any particular community. The largest number of vessel owners that need to buy permits are in Biloxi and Ocean Springs, at 4 permits each (or approximately a $20,000 cost for each of those communities).

A similar result is seen under Alternative 10.C. Again, assuming all owners of non-qualifying vessels that operate in the EEZ need to buy a permit, then 42 permits must be purchased. These 42 vessel owners are widely dispersed across 33 communities, which means that, on average, slightly more than one permit must be purchased per community. Thus, the average cost per community would be between $6,000 and $7,000, which again is minimal at the community level and less than under Preferred Alternative 10.B.

Finally, the results under Alternative 10.D are rather different than under Preferred Alternative 10.B and Alternative 10.C. More permits need to be purchased under this alternative (187), and the owners of these vessels are not quite as dispersed, as they are spread out across 73 different communities. Relatively high concentrations of owners needing to buy permits are particularly seen in Brownsville (20) and Port Arthur (17), with smaller concentrations in Freeport (8) and Palacios (7). Even though the average cost of purchasing permits per community would still be relatively low (slightly less than $13,000), the costs would be relatively higher in Brownsville and Port Arthur ($100,000 and $85,000, respectively).

Another potential problem for those who must purchase permits in order to continue current operations is their ability to pay for them. Although $5,000 may not be a significant amount for profitable or larger enterprises, the economic analysis suggests that many may not possess or have access to the necessary financial capital to purchase them, given the adverse economic conditions in the fishery in recent years and limited access to financial capital markets (i.e. loans through financial institutions). On the other hand, it is also the case that the owners who must purchase permits are widely distributed across many communities in the Gulf. If it is important to other onshore businesses associated with the harvesting sector (e.g. dealers/processors) to keep these owners and their vessels operating in their respective communities, it may be possible to pool community resources (e.g. financial capital and information regarding available permits for sale) in order to effect such an outcome. However, under Alternative 10.D, it would be more difficult for the affected communities, particularly Brownsville and Port Arthur, to pool their resources and achieve the potentially desired result of retaining vessels and their owners. Also, since Brownsville and Port Arthur are in the second least resilient group of communities, their ability to pool resources for such a purpose is likely even less than other communities.

However, for reasons explained in the RIR and alluded to above, the vessels who need to purchase permits may not be able to purchase them, even if that is a less costly option relative to significantly changing or ceasing operations. In that event, even if the fishery as a whole might not lose any landings and revenues, assuming the fishery is operating beyond the level of effort needed to harvest all available shrimp, vessels and thus the communities with whom they are associated would likely lose some or all of their landings and revenues. Initial, direct impacts on harvesters at the community level for Preferred Alternative 10.B and Alternatives 10.C and 10.D are presented in Tables 6.8-6.10, respectively, under the assumption that the only losses to the vessels and their associated communities would be those associated with landings and revenues from the EEZ (assumption 1). While that is one plausible assumption, it may even be more reasonable to expect that potentially impacted small vessels will shift their existing effort from the EEZ to state waters and thereby avoid any direct impacts, while large vessels, lacking that ability, will be forced to exit the fishery and would thus lose all of their landings and revenues (assumption 2). Initial, direct impacts on harvesters at the community level under this second assumption are presented in Tables 6.11-6.13. While the numbers speak for themselves for the most part, some highlights are worth noting and evaluations of the relative outcomes are important. Also, as noted in the RIR, it is important to keep in mind that these initial, direct impacts will be amplified as a result of multiplier effects. However, the multipliers identified in NMFS (2004) for the shrimp fishery are national level multipliers (i.e. they represent effects that will occur throughout the national economy), and

thus they cannot be specifically applied to community level impacts. That is, though the initial, direct impacts to harvesters can be determined at the community level, it is unknown what portion of the total economic impacts are felt within each particular community and beyond. Thus, total economic impacts at the community level are not presented in the following analysis. However, it is reasonable to conclude that the communities which will experience the greatest initial, direct impacts within the harvesting sector will also experience the greatest total economic and social impacts.

Given the information presented in the RIR and assumption 1, under Preferred Alternative 10.B, the most significant social impacts would be felt in Port Arthur, Abbeville, and Palacios, with impacts in Key West being of the next greatest significance. To illustrate, the number of impacted supplying vessels is greatest in Port Arthur and Key West, followed by Palacios.[28] Thus, these communities would face the greatest proportion of the employment losses noted in the economic analysis. Abbeville and Port Arthur would also have the greatest number of impacted dealer/wholesalers. With respect to revenue losses, in absolute terms, Port Arthur would be the most affected, followed by Abbeville and Palacios. In relative terms, the largest percentage losses in revenues, and thus likely income as well, would be seen in Grand Chenier, Crystal beach, and St. Petersburg. The range of revenue losses across these communities is from 0% to 11.8%, with an average per community of 2%. It should be kept in mind that Palacios falls within the group of communities that have been determined to be the least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts, and that Port Arthur and Abbeville fall within the group of communities that is the second least resilient in this respect. There are 34 communities impacted by this alternative to at least some degree. Given the impacts in Port Arthur, it is also possible that the sole processor in that community could be adversely impacted under this alternative.

Under Alternative 10.C, though social and economic impacts would be felt in 30 communities, which is slightly fewer than under Preferred Alternative 10.B, the impacts are similar for some communities but much less significant than under Preferred Alternative 10.B in many respects. For example, impacts are significantly lower under this alternative for Port Arthur, Key West, and to a lesser extent for Biloxi, Pascagoula, Freeport, and Port Bolivar. Impacts are basically the same or only slightly less for Abbeville, Palacios, Dulac, Grand Chenier, Tampa, and most other communities. As with Preferred Alternative 10.B, Abbeville, Port Arthur, and Palacios would experience the most adverse social and economic impacts, with Key West experiencing somewhat less significant impacts. In relative terms, Grand Chenier and Crystal Beach would face the greatest revenue loss in percentage terms, though the percentage losses for St. Petersburg and Pascagoula are significantly lower than under Preferred Alternative 10.B. However, the losses in Port Arthur are still of a large enough magnitude to potentially impact the sole processor in that community. Also, as noted in the discussion of Preferred Alternative 10.B, Palacios falls within the group of communities that have been determined to be the least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts, and Port Arthur and Abbeville fall within the group of communities that is the second least resilient in this respect.

[28]The number of impacted, supplying vessels is not additive across communities since vessels are migratory and supply more than one community.

Finally, under Alternative 10.D, the total number of impacted communities is 39, which is comparable to the number impacted under Preferred Alternative 10.B. However, these impacts are felt by a somewhat different set of communities and the magnitude of the impacts is much greater, absolutely but even more so relatively. In particular, the communities of Port Arthur, Palacios, Brownsville, and Abbeville would experience significant impacts, with somewhat less significant impacts being experienced in Bayou La Batre, Biloxi, Dulac, Galveston, Key West, and Port Bolivar. Impacts of slightly less significance would be felt in Bon Secour, Freeport, Ft. Myers Beach, Sabine Pass, and St. Petersburg. Specifically, Port Arthur, Palacios, Brownsville, Port Bolivar, and Abbeville would see the greatest losses with respect to the number of impacted supplying vessels, and thus in employment as well, and the greatest absolute losses in revenue and thus income. Abbeville, Palacios, and Biloxi would also have the greatest number of impacted dealer/wholesalers. In terms of percentage losses in revenue and income, the greatest impacts would be felt in St. Petersburg, Pensacola, Galveston, Port Bolivar, Sabine Pass, and Port Arthur. Again, it is important to recall that Palacios and Bayou La Batre are in the least resilient group of communities, and Brownsville, Port Arthur, Abbeville, and Galveston are also considered communities that are particularly susceptible to adverse social and economic changes. Given the magnitude of the impacts in Port Arthur, Palacios, and Brownsville, it is also possible that the four processors in those three communities could be adversely impacted under this alternative.

Under assumption 2 (i.e., small vessels shift their effort in the EEZ to state waters and large vessels exit the fishery), the results of the social and community impact analysis are somewhat different. In general, for each alternative, the impacts are more severe under this assumption. Furthermore, for most individual communities, the impacts are also more significant. However, in a few communities, the impacts are slightly less under certain alternatives.

Specifically, under this second assumption, and with respect to Preferred Alternative B, the number of impacted communities (32) is slightly less than under the first assumption, with the communities of Crystal River, Ft. Myers Beach, Barataria, Bayou La Batre, Houma, Lafitte, and Matagorda no longer bearing any impacts, but with the communities of Boothville, Houma, Empire, Marrero, Ocean Springs, and Patterson being impacted. Further, the loss of supplying vessels is significantly less in Biloxi, Galveston, Dulac, Freeport, Golden Meadow, Key West, Port Arthur, and Tampa. The absolute loss in shrimp revenues is lower in Port Arthur, significantly less in Dulac, Freeport, Key West, Pascagoula, Port Bolivar, and Tampa, but significantly greater in Abbeville, Biloxi, and St. Petersburg. In relative or percentage terms, the impacts are less in Pascagoula and significantly less in Freeport, Galveston, Key West, and Port Bolivar, but significantly higher in St. Petersburg, Abbeville, Marrero, Cameron, Ocean Springs, and Patterson. Abbeville and Port Arthur will bear the greatest impacts in absolute terms, though the impacts to Key West are less under this set of assumptions. It should still be kept in mind that Abbeville and Port Arthur fall within the group of communities that is the second least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts. Also, since Port Arthur still faces the greatest impacts in terms of absolute losses in revenues, it is likely that the sole processor in this community will still be impacted to some degree under this set of assumptions.

With respect to Alternative 10.C, the number of impacted communities is 33, which is slightly higher than under the first assumption. The major differences in impacts across the two assumptions under this alternative are somewhat similar to the differences under Preferred Alternative 10.B. For example, under assumption 2, impacts are much greater for Abbeveille, Dulac, and Venice in absolute terms, and significantly higher in relative terms for Marrero, Ocean Springs, and Patterson. Conversely, impacts are much less for Dulac in absolute and relative terms. Crystal River, Barataria, Houma, Lafitte, and Matagorda are not impacted under this assumption, while Boothville, Empire, Marrero, Ocean Springs, and Patterson are. The number of impacted supplying vessels is greatest in Abbeville and Palacios, while the number of affected dealers is greatest in Abbeville and Port Arthur. Again, Port Arthur and Abbeville fall within the group of communities that is the second least resilient with respect to their ability to absorb and adjust to adverse economic and social impacts.

For Alternative 10.D, under the second assumption relative to assumption 1, the number of communities expected to be impacted increases from 39 to 44. More importantly, the impacts in many communities are expected to be more severe, in some instances considerably so. The primary exceptions to this general conclusion are St. Petersburg, which is not impacted at all, and Delcambre, where the impacts are significantly less. Impacts are significantly more adverse under this assumption for Abbeville, Bon Secour, Boothville, Golden Meadow, Grand Isle, Key West, Lafitte, Lockport, Port Arthur, and Venice. With respect to absolute losses in shrimp revenues and income, impacts are particularly severe for Port Arthur and Abbeville, but also very significant in Bayou La Batre, Biloxi, Brownsville, Galveston, Palacios, and Port Bolivar, and somewhat less significant in Bon Secour, Boothville, Dulac, Freeport, Ft. Myers Beach, Key West, Lake Charles, Lockport, and Sabine Pass. In relative terms, Pensacola, Lockport, Galveston, Port Bolivar, New Iberia, Abbeveille, and Sabine Pass will face the greatest impacts. In comparing the impacts across alternatives and assumptions, subject to the previously noted proviso, it is clearly the case that Alternative 10. D under assumption 2 would generate the greatest adverse social impacts at the community level across the Gulf of Mexico.

An additional social impact should be considered in evaluating Preferred Alternative 10.B, and Alternatives 10.C and 10.D. Specifically, it is quite possible that many vessel owners who obtained their permits prior to the December 6, 2003, control date would strongly object to the choice of either Alternative 10.C or 10.D on equity/fairness grounds. That is, from their perspective, all shrimp vessel owners had ample notice and opportunity to obtain a permit prior to the published control date. Vessel owners that did not obtain their permits before that date did so of their own accord, and thus voluntarily assumed the risk accompanying that choice (i.e. the possibility of not being allowed to participate in the fishery in the future). The shrimp vessel owners who obtained their permits by the control date may consider it “unfair” to allow those who did not into the fishery since the latter did not “play by the rules.” That is, allowing the latter vessels into the fishery would reward “bad” behavior. On the other hand, based on experiences in other fisheries where moratoria have been implemented, there are always those who will claim that they did not in fact know of the control date, which is why they did not obtain their permit in a timely manner. The Council will need to evaluate and weigh these competing claims.

Based on the above comparative analysis, as within the RIR, the conclusion of the social impact assessment is that Alternative 10.C minimizes social impacts in general, and generates the least adverse social impacts at the community level. Preferred Alternative 10.B would be the next least onerous, with Alternative 10.D creating the greatest adverse social impacts at the community level.

As stated with respect to the economic impacts on harvesters, the conclusions regarding the social impacts on harvesters and communities must be qualified by the uncertainty regarding vessels that may or may not renew their permits prior to the publication date of the final rule that will implement this amendment. Should all of the vessels that did not renew their permits in calendar year 2005 do so before the final rule's publication date or if new permits are obtained, then no previously permitted vessels would be excluded (and additional vessels could enter), thus there would be no known short-term, adverse social impacts under Alternative 10.D. In that instance, Alternative 10.D would yield lower short-term, adverse social impacts than Alternative 10.C, and thus would be the alternative that minimizes such impacts. However, it is also possible that none or only some of the vessels will renew their permits. It is not possible to predict with any degree of certainty whether any or all of these vessels or other vessels will in fact renew or obtain their permits prior to the final rule's publication date. Thus, it is not possible to conclude with complete certainty whether Alternative 10.D will generate the greatest, the least, or an equivalent level of adverse, short-term social impacts relative to Preferred Alternative 10.B or Alternative 10.C.

Also as stated in the analysis of the economic impacts on harvesters and dealers/wholesalers, whether these social and community level impacts actually occur depends significantly on where the fishery is operating on its yield curve. That is, if the fishery is operating on the downward sloping portion of the yield curve, then the impacts are likely to occur. However, if it is still operating at or beyond the curve's asymptote, then these impacts are less likely to occur at the level of the fishery as a whole. Even in that case, it is still quite likely that landings and revenues will be redistributed between qualifying and non-qualifying vessels, as well as the dealers/wholesalers and communities associated with those vessels. Thus, some if not most of the communities will be adversely impacted regardless of whether the fishery is operating on its yield curve.

8.5 Direct and Indirect Effects on the Administrative Environment

The effects on the administrative environment are discussed under Sections 4.0 and 5.0 and incorporated here by reference. In essence, all of the proposed actions in this amendment could have short-term negative impacts on the administrative environment; however they are not determined to be significant. Additionally, Action 1 could potentially require issuance of a separate royal red shrimp vessel permit or an endorsement that could increase the workload on NMFS to issue and renew same. However, since all vessels currently operating in the fishery have commercial shrimp vessel permits, and there are only approximately 15 such vessels, the burden would be hardly measurable.

Actions 2 through 7 would potentially implement new definitions of MSY and OY for royal red shrimp and penaeid shrimp, as well as overfishing and overfished definitions for royal red shrimp in the Gulf. The only administrative burden from these actions would be those associated with

implementation of the proposed and final rules. Such impacts would be minor and are required for all management actions.

Under Action 8, alternatives to implement either paper or electronic logbooks and possibly expand the present observer program, there could potentially be more extensive impacts. As noted in the RIR, and expanded observer program to gain even a 1% coverage of vessels would cost approximately $5.4 million per year; whereas a recommended 5% coverage would cost approximately $27 million per year. These costs would be significant to the administrative environment. Neither the choice of paper or electronic logbooks would result in significant impacts, but paper logbooks would be more impacting than electronic logbooks because the data would have to be actually entered and computerized; whereas with electronic logbooks the data could simply be downloaded. Both actions would take time and resources on a continuing basis, but in the long run some of that time and resources could replace current efforts to process data from interviews by port agents and other activities such that there could be a savings at some point in time.

Action 9 could require shrimp vessel permit holders to complete a gear and vessel characterization form, and the information submitted would have to be entered and, if needed, analyzed. Although compilation of this information will require the expenditure of administrative resources there would be no more than 2,951 vessels that would be supplying this information. Additionally, since the information would be supplied when the permits are renewed (coinciding with the vessel owner's birth date), it will be coming in gradually over the course of a year. Consequently, and impacts, albeit small even in total, would be spread over the entire year, and thus would not be significant.

Action 10 should not have any negative administrative impacts beyond that required to communicate with qualifying owners and vessels. Positive impacts would result from alternatives that would reduce the number of permittees by lessening the burden of issuing and reissuing commercial shrimp vessel permits.

Reporting of landings (Action 11) would also not result in any significant impacts to the administrative environment. Landings are currently collected primarily from dealers while some trip information is collected. If individual permittees are required to report and certify their landings, they would only be reporting the same information that is currently submitted on trip tickets in all Gulf states except Mississippi and Texas. The only additional burden would come from NMFS having to collect and input the data from these two states, as opposed to obtaining the already compiled data from the other states. The impacts would be commensurate with the timeframe required for reporting. For example, monthly reporting would be more onerous than quarterly reporting and quarterly reporting would be more impacting than semi-annual, etc. The least impacting option would be annual reporting, possibly as part of the vessel and gear characterization form under Action 9.

8.6 Mitigation Measures

Based on a review of documents listed in Section 8.2 and the discussions in Section 5.0, it has been determined that no mitigating measures related to the alternatives are necessary because the alternatives to establish royal red shrimp vessel permits/endorsements, set appropriate definitions for the overfished condition, the overfishing threshold, MSY, OY, improve effort data, establish a bycatch reporting methodology, require the annual completion of a vessel and gear characterization form, implement a moratorium on the issuance of new commercial shrimp vessel permits, and require reporting of landings during the 10-year moratorium will have no effect on the physical environment that would require mitigation.

8.7 Cumulative Effects

The shrimp fishery in the Gulf of Mexico has been previously subjected to cumulative impacts from management actions primarily through the imposition of TEDs (by regulatory action of NMFS under the Endangered Species Act [ESA]), BRDs (through the implementation of Amendments 9 and 10) and various seasonal and area closures (see Section 2.0 and 50 CFR, Part 622). The requirement of TEDs and BRDs was instituted to protect endangered and protected species, as well as to reduce bycatch as required by National Standard 9 of the M-SFCMA. Seasonal and area closures have been implemented to both reduce gear conflicts as well as allow shrimp to grow to a larger, more valuable size. These requirements have not been imposed on royal red shrimp vessels; consequently, there have been no cumulative impacts to this fishery. Because penaeid shrimp are an annual crop (as discussed in Sections 4.0 and 5.0), these actions have not had a significant impact on overall catch, and some of the highest historical catches have occurred since the imposition of these measures. In summary, there have been few regulations that could potentially limit the harvest of shrimp in the Gulf, thus cumulative impacts to date would be considered insignificant.

Proposed actions in this amendment would likely not pose additional significant impacts. Action 1 would only help improve the use of data from the royal red shrimp vessels through establishment of an endorsement to the existing Gulf shrimp permit that would have no effect on fishing and minimal impact on current harvesting vessels (14) to pay ($20) and for managers to process, respectively. Actions 2 through 7 would only establish definitions for MSY, OY, overfishing and the overfished condition of shrimp stocks that have not previously been approved as required by law, and would likewise not effect fishing, unless future action is taken as a result of these targets and thresholds being exceeded, which is highly unlikely. Action 8 would only have impacts to fishing operations if the carrying of observers resulted in reduced fishing time, which is not expected. Action 9 would not affect fishing operations and would only require vessel permit holders to complete a form annually. Consequently, impacts would be insignificant. Action 10 would implement a moratorium on the issuance of new commercial shrimp vessel permits. Under the preferred alternative, of the 2,951 currently permitted vessels, only 72 vessels that were active in the EEZ (i.e. had landings from EEZ waters in 2002) would not be issued a permit when the moratorium is implemented. Additionally, as noted in Section 4.0, these vessels could likely purchase a permit if desired, and the cost initially would probably be approximately $5,000, which is likely a less costly option compared to significantly altering or ceasing operations for most of the 72 vessels. Thus, negative impacts are expected to be insignificant for the vast majority of current participants in the EEZ fishery. Finally, Action 11 would only require reporting of landings. Such

a requirement would pose minimal impacts, if any, because such reporting is already required if a vessel owner or operator is called upon to report and most vessel owners already compile this information for other reasons. Furthermore, any burden could be ameliorated by adding this required information to an existing or proposed data collection program/form, such as the vessel/gear characterization form under Action 9.

Since none of the actions affects actual fishing operations, there would be no impacts to other fisheries as a result of implementing any of the alternatives. Subsequent to establishing a bycatch reporting methodology, the Council expects to obtain better information on the amount and type of bycatch that is occurring in shrimp trawls. This information could lead to actions to further reduce bycatch and some of that bycatch would likely be other managed species. Consequently, if such actions are taken in the future there would be impacts to other fisheries; however, such impacts would be expected to be mostly beneficial.

8.8 Unavoidable Adverse Effects

Based on a review of documents listed in Section 8.2, and as discussed in Section 4.0 herein, it has been determined that the alternatives do not create unavoidable adverse affects on the environment because, no adverse impacts on the environment will occur as a result of establishing a royal red shrimp vessel permits/endorsements, set appropriate definitions for the overfished condition, the overfishing threshold, MSY, OY, improve effort data, establish a bycatch reporting methodology, require the annual completion of a vessel and gear characterization form, implement a moratorium on the issuance of new commercial shrimp vessel permits, and require reporting of landings during the 10-year moratorium. As discussed above under Section 4.0 and in Sections 8.1 through 8.5 herein, future effects of the actions proposed herein will probably be positive.

8.9 Relationship Between Short-Term Uses and Long-Term Productivity

Of the actions proposed in this amendment, only Action 10: Alternatives to establish a commercial shrimp vessel permit moratorium, brings in issues of short-term uses and long-term productivity. While the short-term uses of the shrimp fishery may be affected by not allowing additional new participants into the fishery through establishment of a cap via the moratorium, long-term productivity should benefit. However, as discussed in the RIR and in the socioeconomic discussions under Section 4.0, the shrimp industry is currently in a state of downsizing as a result of high operating costs and reduced prices from competition with foreign imports. This condition is expected to continue until at least 2012. Consequently, the long-term benefits would not accrue to participants for several years. Additionally, because shrimp are an annual crop, it is not likely that total productivity would be increased; however, the productivity of individual vessels that remain in the fishery would be enhanced. Consequently, this action should provide greater stability to the shrimp fishery in the long run.

8.10 Irreversible and Irretrievable Commitments of Resources

There could be some irreversible and potentially irretrievable commitments of resources from some of the alternatives establishing a royal red shrimp vessel permits/endorsements, set appropriate definitions for the overfished condition, the overfishing threshold, MSY, OY, improve effort data, establish a bycatch reporting methodology, require the annual completion of a vessel and gear characterization form, implement a moratorium on the issuance of new commercial shrimp vessel permits, and require reporting of landings during the 10-year moratorium. There would be additional costs to NMFS from establishing an additional permit or endorsement for royal red shrimp vessels, alternatives to establish logbooks or increase the current observer coverage, processing vessel and gear characterization forms, and monitoring individual vessel's landings. These costs would be ongoing and thus irreversible. As discussed in Section 4.0 and in Sections 8.1 through 8.5 herein, these costs would be minimal and administrative in nature. Furthermore, the benefits of improved data from these actions far outweigh these minor costs.

8.11 Any Other Disclosures

No additional disclosures are known to be needed or discussed.

9.0 FINDING OF NO SIGNIFICANT ENVIRONMENTAL IMPACT (FONSI)

The Gulf of Mexico Fishery Management Council (Council) is submitting the attached Amendment 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters for Secretarial review under procedures of the M-SFCMA. Amendment 13 was developed as an integrated document that includes an EA, RIR, and RFA. Copies of the Amendment are available from the Council at the following address:

Gulf of Mexico Fishery Management Council
Airport Executive Center
2203 North Lois Avenue
Suite 1100
Tampa, Florida 33607-2370

The EA considers information contained in the EIS associated with the original Shrimp FMP, a SEIS associated with Amendment 9 to the Shrimp FMP, as well as the Generic EFH Amendment. The NMFS has reviewed these actions as well as the comprehensive analyses of the alternatives (including the proposed alternatives) as discussed in Sections 4.0, 5.5, 7.0 and 8.0 in Amendment 13; and these supportive analyses of impacts are herein incorporated by reference.

Summary of Effects - Rationale

Permits/Endorsements for Harvesting Royal Red Shrimp:

As discussed in Section 4.0, Action 1 and in Sections 5.5 and 8.0, there would be very little, if any impacts from requiring a separate vessel permit or an endorsement to the existing shrimp vessel permit because there are only approximately 10 vessels operating in this

fishery. Consequently, any burden on fishermen or NMFS would be minuscule. Furthermore, not requiring such permits/endorsement would result in no change because each of these vessels are currently required to have the federal shrimp vessel permit.

MSY, OY, Overfishing, and Overfished Definitions for Royal Red and Penaeid Shrimp:

As discussed in Section 4.0, Actions 2 through 7, and in Sections 5.5 and 8.0, there would be no impacts either positive or negative from setting these definitions that have not previously been approved. They are required for managed species by the M-SFCMA and 50 CFR 600.310 and do not impose any impacts other than the administrative procedures required to implement them. There is no impact to the fishing industry; however, they provide management with the necessary tools to measure if overfishing is occurring and if a stock should become overfished, as well as a target OY upon which to manage these stocks as required by the M-SFCMA.

Establish a Bycatch Reporting Methodology Through the Use of Observers and Logbooks: As discussed in Section 4.0, Action 8 and in Sections 5.5 and 8.0, the severity of impacts would vary depending on the method of bycatch reporting that is required. The use of the current observer program and effort data collection would impose no additional burdens, and electronic-logbook reporting would only be slightly more costly to the shrimp industry and the least costly for management. However, making the observer program mandatory with participation (if called upon) a condition of renewal of the permit and/or expanding the observer coverage could have potentially negative social and economic impacts to the industry. An expansion of the program would also increase costs to NMFS. A requirement for captains to report findings on paper logbook forms would be burdensome to the industry, and most likely, highly inaccurate.

Require completion of a Gulf Shrimp Vessel and Gear Characterization Form

Information on the vessels operating in the shrimp fishery as well as the amount and type of gear being used is currently lacking. Requiring the completion of a Gulf Shrimp Vessel and Gear Characterization Form by all permitted shrimp vessels, annually, as a condition for receiving or renewing a federal shrimp vessel permit would provide needed data on the amount and type of gear that is being used. In turn, this information will enhance analyses of effort and bycatch, as well as operating costs. The database could also be used as a universe for future characterization studies, and there would be little burden on permittees to complete this form.

Establish a Moratorium on the Issuance of New Shrimp Vessel Permits

As discussed in Section 4.0 under Action 10 and in Sections 5.5 and 8.0 participants in the shrimp fishery are experiencing economic hardship primarily related to depressed prices and high fuel costs. The current reduction in price for shrimp has been good for the consumer, but it is forcing shrimp vessels (particularly larger, offshore vessels in excess of 60 feet in length) out of the fishery. Under any of the alternatives, it is expected that

vessels will continue to exit the fishery until approximately 2012 when the number of vessels will be reduced to a level such that the available resource can be harvested profitably. Current fishery participants should be aware that the Council established a control date of December 6, 2003, which allowed over one year from the time of the permit requirement until this control date for would-be participants to obtain the permit. The establishment of the control date was a signal to fishermen that, should they desire to continue to participate in the fishery, they needed to obtain a permit by that date or face the possibility that they would not be allowed to participate should the Council decide to implement a moratorium or other form of effort management program in the future. Persons interested in entering this fishery may still do so under the moratorium by acquiring an existing vessel permit through transfer. Establishing a moratorium and allowing the permits to become transferable would eliminate or at least significantly reduce the existing economic uncertainty in the market, thereby encouraging efficient business exchanges, and also eliminate or at least significantly reduce the stress and social disruptions arising from the current system. Capping participation to current participants or to those who possessed valid permits on or before a given control date, should mitigate conflicts in the future regarding speculative entrants in the fishery.

Require reporting and certification of landings during a moratorium

By requiring that all vessels report landings during the permit moratorium, the Council would have a universe to stratify vessels' catches into different classes or categories. This would provide a basis for capping actual fishing effort or reducing it in the future, if effort reduction is determined to be needed. There would be no biological impacts from such a requirement and the economic and social impacts would be based in general on how frequently and to what degree reporting is required. Trip reports are available for all Gulf states, except Texas and Mississippi, through existing state programs and could be used without additional burden on the industry in the other areas. Trip reporting in Mississippi and Texas would be more burdensome than monthly, quarterly, or annual reporting.

Conclusion

The Council on Environmental Quality regulations implementing the NEPA and NOAA's Administrative Order (NAO) 216-6 require that decision makers take into account both context and intensity when evaluating the significance of impacts resulting from a major Federal action (40 CFR 1508.27; NAO 216-6, Section 6.01(b)). Evaluating significance with respect to context requires consideration of the local, regional, national, and/or global impacts of the action. Intensity refers to the severity of the impact, and is to be evaluated using specific criteria outlined at 40 CFR 1508.27(b) and at NAO 216-6, Sections 6.01(b) and 6.02. The key findings of the Council related to the significance of the impacts associated with the proposed actions follow. The findings are organized under the intensity criteria and include a consideration of the context in which the impacts occur. A

more thorough review of any impacts that would include these significance factors are discussed under the alternatives for each action in Sections 4.0 and 5.0 herein.

(1) Beneficial and Adverse Impacts: As discussed in Sections 4.0, 5.0, and 8.0, there would be no adverse impacts from requiring additional permits or endorsements for vessels harvesting royal red shrimp in the EEZ of the Gulf (Action 1). There are currently only approximately 14 vessels landing shrimp in this fishery, and they are already required to have a federal shrimp vessel permit. Because the number of vessels that have historically fished in this fishery is between 5 and 15; catches approached the MSY level in 1994; and there is always the possibility that the amount of participation may increase, requiring a separate permit or endorsement would provide an easily accessible database of vessels on an annual basis from which to sample catches, CPUE, and to gather other information that could be beneficial to management.

As discussed in Sections 4.0 and 5.0 for Actions 2 through 7 and summarized in Section 8.0, there would be no adverse impacts from setting definitions for the overfished condition, the overfishing threshold, MSY, and OY for royal red or the 3 species of penaeid shrimp that have not previously been established. These definitions do not of themselves impose any additional restrictions or relaxation of management measures. They are, however, required for managed species by the M-SFCMA and 50 CFR 600.310. They are also beneficial to management, particularly the definitions of overfishing and the overfished condition, because these definitions provide thresholds upon which additional management measures may be triggered. The definitions of MSY and OY also provide a management target that would help prevent overfishing from occurring.

A standardized bycatch reporting methodology is a required provision of fishery management plans under Section 303 (a)(11) of the M-SFCMA in order to determine the amount and type of bycatch that is occurring in a fishery and to subsequently minimize such bycatch to the extent practicable. A program that utilizes observers and some measure of shrimping effort is not only required but is beneficial in accomplishing the mandate of National Standard 9. As discussed in Sections 4.0 and 5.0 for Action 8, there are potential adverse social and economic impacts from the various choices of bycatch reporting criteria and effort gathering. Reporting of effort using paper logbooks as suggested under Alternative 8.A would not have immediate direct beneficial or adverse consequences on fishery resources, but as discussed in Section 4.0 and 5.0, there would be rather significant adverse impacts to users, and the accuracy of the data would be questionable. Utilizing electronic logbooks would have the potential for fewer impacts than paper logbooks for reporting effort as suggested under Alternative 8.B because they would have less reliance on fishermen's memory, but there would still be costs involved with purchase and maintenance; however, they would not be borne by fishermen. Reporting of bycatch using observers in the existing voluntary program would have no beneficial or adverse impacts; however, if participation is mandatory for permit renewal or the program is expanded, there could be adverse impacts, but any such impacts cannot be measured at this time. However, the benefits in the form of improved data of a more

random selection of vessels that would carry observers would likely outweigh any negative impacts.

As described in Sections 4.0 and 5.0 for Actions 9 and 11, there will be some burden costs to the fishermen for these proposed reporting requirements. Nevertheless, as noted in Section 5.5.9, the requirement for fishermen to annually complete a vessel and gear characterization form (Action 9) could be included with the permit application form, and could be returned at the same time, thereby minimizing any expense. Vessel owners would already have landings information at their disposal and many would already be reporting it to various programs; thus, the cost of providing and certifying the landings as proposed in Action 11, should be minimal.

Establishing a moratorium on the issuance of new shrimp vessel permits (Action 10) will impact persons who wish to enter the fishery; however they will be able to acquire a permit via transfer. Allowing the permits to become transferable would eliminate or at least significantly reduce the existing economic uncertainty in the market, thereby encouraging efficient business exchanges.

(2) Public Safety: As discussed in Sections 4.0 and 5.0 for Actions 1 through 7 and 10 and 11, none of the alternatives would affect public safety. With regard to Action 8, none of the logbook alternatives (Alternative 8.A or 8.B) would have consequences on public health or safety because they only require electronic and paper reporting. Option 3 of Alternative 8.C that requires observers could pose a minimal threat to these observers; however, observers are used for reporting in many other fisheries, and reasonable accommodations are made to protect them.

(3) Damage to ocean and coastal habitats or EFH and consideration of unique geographic areas: As discussed in Sections 4.0 and 5.0, none of the actions would have any affect on unique characteristics of geographic areas where shrimping occurs because these alternatives do no impose or relax any existing regulations or change fishing activities. For these reasons, the actions would not have any effect on EFH or flood plains, rivers, creeks, or other streams and tributaries to the marine environment or their associated wetlands.

(4) Highly Controversial effects on Human Environment: Effects on the human environment are discussed in greater detail in Sections 4.0, 5.0, and 8.0. Action 1, in essence, maintains status quo. A permit is required for royal red shrimp vessels; the action would simply alter the specifics of that permit by adding an endorsement to harvest royal red shrimp. Actions 2 through 7 do not directly affect the fishery, unless further Council action is required to meet the established targets. There would likely be controversial effects on the human environment due to the imposition of Actions 8 and 11 because of the increased burden on the fishermen to report the required information, and minimally for Action 9. A paper logbook requirement, as discussed in Action 8, could cause a significant burden due to the problems and impositions previously mentioned, as well as the probability of poor data; however, these may be ameliorated by the proposal to require electronic logbooks, particularly if only a subset of permit holders are required to use them.

Although not as severe as the logbook alternatives, Option 3 under Alternative 8.C would require observers and would probably have controversial effects on the human environment. Typically, fishermen do not like to take observers onboard for various reasons. Some may fear liability for the safety of observers and others feel that they are simply a nuisance because they are "in the way." A voluntary observer program would obviously not be controversial. On the other hand, an observer program that is mandatory would expose shrimp fishermen to the risk that their fishing craft may not be adequately equipped to carry an extra person. Although this may be partly addressed by the requirement imposed under Section 403 (a) of the M-SFCMA regarding the health and safety of observers. Also, the potential of not having a permit renewed would have potentially severe consequences if fishermen disagree with managers on the suitability of there vessels. The requirement of observers could also add liability considerations if an observer is injured. On the other hand, observers have been used to collect data in a number of other fisheries.

Action 10, to establish a moratorium on the issuance of shrimp vessel permits is controversial. Current fishery participants should be aware that the Council established a control date of December 6, 2003. The establishment of the control date was a signal to fishermen that, should they desire to continue to participate in the fishery, they needed to obtain a permit by that date or face the possibility that they would not be allowed to participate should the Council decide to implement a moratorium or other form of effort management program in the future. Many fishermen are apprehensive regarding establishment of the control date because, in other fisheries, this has generally meant that a limited entry system will be implemented in the near future. "Limited entry" is a term that some fishermen strongly dislike, because they see it as a means of possibly taking their livelihoods away. Nevertheless, allowing the permits to become transferable under a moratorium would eliminate or at least significantly reduce existing economic uncertainty in the market, thereby encouraging efficient business exchanges, and also eliminate or at least significantly reduce the stress and social disruptions arising from the current system. Capping participation should mitigate conflicts in the future regarding speculative entrants in the fishery. Action 11 would not be controversial because landings data are currently being collected by both state and federal programs.

(5) Uncertain, Unknown, or Unique Risks: As discussed in Sections 4.0 none of these actions would cause uncertain, unknown, or unique risks. A requirement of observers (Action 8) should not impose any uncertain risks to the shrimp industry because they have already been used under experimental conditions, but there may be some implications. There may be additional risks to observers, although such risks are not unique as observers are widely used in in other fisheries in other regions.

(6) *Precedence*: As discussed in Sections 4.0 and 5.0, the only alternatives that would set a precedence are the requirement of logbooks and observers under Action 8, the completion of a vessel and gear characterization form under Action 9, and a moratorium under Action 10. Permits and reporting are already required in most other fisheries, and there are moratoriums already in place in several permitted fisheries. Logbooks are currently not

required in the shrimp fishery; however, they are required in other fisheries in the Gulf, including the reef fish fishery and the coastal migratory pelagics fishery. The mandatory requirement of observers in the shrimp fishery to identify and measure bycatch would set a precedence for all managed fisheries because observers are not currently required to measure bycatch in any other Council- managed fishery. A continued or expanded voluntary program would not have this implication.

(7) Jeopardy to the sustainability of target and non-target species, including endangered species: The proposed actions are not expected to jeopardize the sustainability of target or non-target species. As noted in Section 1.0, shrimp stocks are not overfished or undergoing overfishing. As discussed in Section 3.0, the environment plays a bigger part in annual recruitment than fishing mortality. A sufficient quantity of parent stock that can produce MSY serves as a functional proxy for B_{MSY}. The proposed actions do not alter the manner in which the fishery is prosecuted, thus there should be no direct impacts on bycatch either. Proposed Actions 8 through 11 will provide additional information regarding gear, effort, catch, and bycatch in the fishery that will enhance managers' understanding of the impacts on bycatch. This may result in additional measures in the future that would provide methods to reduce bycatch further. A formal Section 7 consultation will be conducted on this amendment when it is submitted for review by the Secretary of Commerce. Current regulations, under the Endangered Species Act, reduce the impacts to the extent practicable for endangered or threatened species that may be encountered in this fishery.

(8) Impacts on biodiversity and ecosystem function: Recent advances in ecosystem modeling may provide better insight into the potential impacts of management regulations on biodiversity and ecosystem functions in the future. At present, however, there is insufficient data to render decisions regarding such impacts, the degree to which they interact, or their ecosystems in the Gulf of Mexico. Biodiversity and the functional aspects of ecosystems on which the various shrimp species rely change constantly by area and time, with or without the influences of fishing. On the other hand, fishing and actions to regulate fishing may or may not cause impacts to biodiversity and the function of ecosystems. The proposed Actions (8 through 11) to collect better information on the catch, effort, and bycatch in the fishery may lead to regulations that would reduce impacts and improve biodiversity.

(9) Cumulative impacts to target and nontarget species and the environment: As discussed in Section 8.7, previous actions to require TEDs, BRDs, as well as seasonal and area closures, have not had a significant impact on overall catch, and some of the highest historical catches have occurred since the imposition of these measures. Proposed actions in this amendment would not pose additional significant impacts because they do not affect fishing activities. Since none of the actions affects actual fishing operations, there would be no impacts to other fisheries as a result of implementing any of the alternatives. Subsequent to establishing a bycatch reporting methodology, the Council expects to obtain better information on the amount and type of bycatch that could result in future actions and impacts that would be expected to be mostly beneficial. In summary, there have been few regulations that could potentially limit the harvest of shrimp in the Gulf, thus cumulative impacts to date would be considered insignificant.

(*10) Historical/Cultural Impacts:* No known sites included in the National Register of Historic Places have been identified in the action area. The proposed actions will not result in any significant impacts on scientific, cultural, or historical resources such as the Monitor National Marine Sanctuary etc. (see Damage to ocean and coastal habitats or EFH and consideration of unique geographic areas [#3]).

(11) Endangered Resources: A formal Section 7 consultation for the shrimp fishery will be conducted by the Protected Resource Division of the Southeast Regional Office in conference with the Sustainable Fisheries Division. However, the shrimp fishery and proposed actions in this amendment are not expected to jeopardize the continued existence of any endangered or threatened species that may be encountered in this fishery, and measures such as the requirement of TEDs have been implemented to reduce bycatch of endangered and threatened sea turtles to the extent practicable.

(12) *Interaction With Existing Laws for Protection of the Environment:* The proposed actions will not threaten or violate federal, state, or local laws or regulations imposed for the protection of the environment. These include the ESA, CZMA, and other applicable laws described in Section 10.0.

Based on the analyses and discussions in this document, including its EA, and in the other referenced documents and sections herein, I have determined that the proposed actions as described for the commercial shrimp fishery in the Gulf of Mexico would not significantly affect the quality of the human environment. Accordingly, preparation of a supplemental environmental impact statement is not required by Section 102(2)(c) of NEPA, by the CEQ regulations implementing NEPA, or by NAO 216-6.

Approved:_____

_____

_____

Assistant Administrator for Fisheries Date

10.0 OTHER APPLICABLE LAW

The M-SFCMA (16 U.S.C. 1801 et seq.) provides the authority for fishery management in federal waters of the EEZ. However, fishery management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision making are summarized below.

10.1 Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day waiting period from the time a final rule is published until it takes effect.

10.2 Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 (CZMA), as amended, requires that federal activities that affect any land or water use or natural resource of a state's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency determination are set forth in NOAA regulations at 15 C.F.R. part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

The proposed changes through alternatives establishing a separate royal red shrimp permit or an endorsement, establishing definitions for the overfished condition, the overfishing threshold, MSY, OY, improve effort data, establish a bycatch reporting methodology, and institute a moratorium on the issuance of new shrimp vessel permits in the shrimp fishery will make no changes in federal regulations that are inconsistent with the objectives of either existing or proposed state regulations. Consequently, NMFS has determined that this plan amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. This determination has been submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

10.3 Data Quality Act

The Data Quality Act (DQA) (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the Act directs the Office of Management and Budget (OMB) to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and disseminate agency-specific standards to: (1) ensure information quality and develop a pre-dissemination review process; (2) establish administrative mechanisms allowing affected

persons to seek and obtain correction of information; and (3) report periodically to OMB on the number and nature of complaints received.

Scientific information and data are key components of FMPs and amendments and the use of best available information is the second national standard under the M-SFCMA. To be consistent with the Act, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data should also undergo quality control prior to being used by the agency and a pre-dissemination review performed. Note that the pre-dissemination review will be preformed.

10.4 Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. Section 1531 et seq.) requires that federal agencies use their authorities to conserve endangered and threatened species. The ESA requires NMFS, when proposing a fishery action that "may affect" critical habitat or endangered or threatened species, to consult with the appropriate administrative agency (itself for most marine species, the U.S. Fish and Wildlife Service for all remaining species) to determine the potential impacts of the proposed action. Consultations are concluded informally when proposed actions may affect but are not likely to adversely affect" endangered or threatened species or designated critical habitat. Formal consultations, including a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" endangered or threatened species or adversely modify designated critical habitat. If jeopardy or adverse modification is found, the consulting agency is required to suggest reasonable and prudent alternatives.

10.5 Executive Orders

10.5.1 E.O. 12612: Federalism

The Executive Order on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The Order serves to guarantee the division of governmental responsibilities between the national government and the states that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people. This Order is relevant to FMPs and amendments given the overlapping authorities of NMFS, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate state, tribes and local entities (international too).

No Federalism issues have been identified relative to the actions proposed in this amendment. Therefore, consultation with state officials under Executive Order 12612 is not necessary.

10.5.2 E.O. 12866: Regulatory Planning and Review

Executive Order 12866: Regulatory Planning and Review, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a RIR for all fishery regulatory actions that either implement a new fishery management plan or significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society of proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the RFA. A regulation is significant if it is likely to result in an annual effect on the economy of at least $100,000,000 or has other major economic effects. The actions proposed in this amendment would not have this significance.

10.5.3 E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires that each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. There are no takings implications from the actions proposed in this amendment.

10.5.4 E.O. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations

Please delete your paragraph below and replace it with the following paragraphs, which come directly from internal guidance and much more clearly explain the purpose of this Order.

Executive Order (E.O.) 12898 requires that, "to the greatest extent practicable and permitted by law...each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health of environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions..." E.O. 12898 requires Federal agencies, when applicable, to analyze the effects of their policies, programs and actions on low-income and minority populations. When applicable, environmental justice issues should be analyzed within the NEPA document.

The E.O. requires, whenever practicable and appropriate, that NMFS Fisheries collect, maintain and analyze data on minority populations, low-income populations and Indian tribes, particularly

in cases where a fishery management actions may affect subsistence consumption patterns of fish and/or wildlife.

10.5.5 E.O. 12962: Recreational Fisheries

This Executive Order requires federal agencies, in cooperation with States and Tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, it establishes a seven member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA. There are no recreational fishing issues addressed by the actions in this amendment.

10.5.6 E.O. 13084: Consultation and Coordination With Indian Tribal Governments

This Executive Order recognizes and reaffirms the U.S. governments responsibility for continued collaboration and consultation with tribal governments in the development of federal policies that have tribal implications. This Order relates to indigenous fishing. There are no indigenous fishing rites associated with this amendment or the Shrimp FMP, as amended.

10.5.7 E.O. 13089: Coral Reef Protection

The Executive Order on Coral Reef Protection requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and, to the extent permitted by law, ensure that actions that they authorize, fund or carry out do not degrade the condition of that ecosystem. By definition, a U.S. coral reef ecosystem means those species, habitats, and other national resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., federal, state, territorial, or commonwealth waters). There are no implications to coral reefs by the actions proposed in this amendment because it makes no changes to fishing activities.

10.5.8 E.O. 13158: Marine Protected Areas

Executive Order 13158 requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area. The broad definition of MPAs will include many sites in the U.S. EEZ as part of the National Marine Protected Areas (MPA) System. This amendment would have no impacts to MPAs.

10.5.9 E.O. 13186: Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186 directs each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a memorandum of understanding (MOU) with the (USFWS) to conserve those bird populations. The MOU will address actions taken by NMFS that have, or are likely to have, a measurable negative effect on migratory bird populations. In the instance of unintentional take of migratory birds, NMFS would develop and use principles, standards, and practices that will lessen the amount of unintentional take in cooperation with the USFWS. Additionally, the MOU would ensure that NEPA analyses evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.

The required MOU is currently being developed, which will address the incidental take of migratory birds in commercial fisheries under the jurisdiction of NMFS. The NMFS must monitor, report, and take steps to reduce the incidental take of seabirds that occurs in fishing operations. The United States has already developed the U.S. National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries, and many potential MOU components are already being implemented under that plan. Development of the plan was a collaborative effort between NMFS, USFWS, and the Department of State, carried out in large part by the Interagency Seabird Working Group consisting of representatives from those three agencies. This amendment would not cause any interactions with migratory birds.

10.6 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and on the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea and marine otters, polar bears, manatees, and dugongs.

Part of the responsibility that NMFS has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as “depleted,” and a conservation plan is developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, development and implementation of take~reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries, and studies of pinniped_fishery interactions.

Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. The categorization of a fishery in the LOF determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements.

10.7 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires all federal actions to be evaluated for potential environmental impacts, and for these impacts to be assessed and reported to the public. As it applies to the formulation of fishery management plans, the NEPA process should ensure that the potential environmental ramifications of actions determined necessary to manage a fishery are fully considered through the development and analysis of a range of reasonable alternatives. Thus, proposed regulations that may set size or bag limits, limit the number of permits or vessels, quotas, allowable gears, closed seasons or areas, and any other measures are reviewed for potential affects on the broader marine environment, in addition to its affect on the specific fishery being managed.

Councils may initially conduct an Environmental Assessment (EA), which is a concise statement that determines whether the FMP (and subsequently any proposed amendment) will have a significant impact on the environment. If there is no potential significant impact, a "Finding of No Significant Impact," or FONSI, is issued. Because the actions proposed in this amendment only pertain to permits, data collection, and a moratorium on permits in a declining fishery, there are no significant impacts that would require the preparation of a SEIS. Consequently, this document includes an EA with a FONSI.

10.8 Migratory Bird Treaty Act

Under the Migratory Bird Treaty Act (MBTA), it is unlawful to pursue, hunt, take, capture, kill, possess, trade, or transport any migratory bird, or any part, nest, or egg of a migratory bird, included in treaties between the United States and Great Britain, Mexico, Japan, or the former Union of Soviet Socialists Republics, except as permitted by regulations issued by the Department of the Interior. Violations of the MBTA carry criminal penalties; any equipment and means of transportation used in activities in violation of the MBTA may be seized by the United States government and, upon conviction, must be forfeited to it. To date, the MBTA has been applied to the territory of the United States and coastal waters extending three miles from shore. Furthermore, Executive Order 13186 (see Section 9.5.9) was issued in 2001, which directs federal agencies, including NMFS, to take certain actions to further implement the MBTA. The actions

proposed in this amendment would have no implications to the MBTA because fishing for shrimp does not impact migratory birds.

10.9 National Marine Sanctuaries Act

Under the National Marine Sanctuaries Act (NMSA) (also known as Title III of the Marine Protection, Research and Sanctuaries Act of 1972), as amended, the Secretary of Commerce is authorized to designate National Marine Sanctuaries to protect distinctive natural and cultural resources whose protection and beneficial use requires comprehensive planning and management. The National Marine Sanctuary Program is administered by the Sanctuaries and Reserves Division of the NOAA. The Act provides authority for comprehensive and coordinated conservation and management of these marine areas. The National Marine Sanctuary Program currently includes 13 sanctuaries around the country, including sites in American Samoa and Hawaii. These sites include significant coral reef and kelp forest habitats, and breeding and feeding grounds of whales, sea lions, sharks, and sea turtles. A complete listing of the current sanctuaries and information about their location, size, characteristics, and affected fisheries can be found at http://www.sanctuaries.nos.noaa.gov/oms/oms.html. The actions proposed in this amendment would have no impact to any national marine sanctuaries because it only involves commercial permits and data collection in the shrimp fishery of the Gulf.

10.10 Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501 et seq.) regulates the collection of public information by federal agencies to ensure that the public is not overburdened with information requests, that the federal government's information collection procedures are efficient, and that federal agencies adhere to appropriate rules governing the confidentiality of such information. The PRA requires NMFS to obtain approval from the OMB before requesting most types of fishery information from the public.

10.11 Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) of 1980 (5 U.S.C. 601 et seq.) requires federal agencies to assess the impacts of regulatory actions implemented through notice and comment rulemaking procedures on small businesses, small organizations, and small governmental entities, with the goal of minimizing adverse impacts of burdensome regulations and record-keeping requirements on those entities. Under the RFA, NMFS must determine whether a proposed fishery regulation will have a significant economic impact on a substantial number of small entities. If not, a certification to this effect must be prepared and submitted to the Chief Counsel for Advocacy of the SBA. Alternatively, if a regulation is determined to significantly impact a substantial number of small entities, the act requires the agency to prepare an initial and final Regulatory Flexibility Analysis to accompany the proposed and final rule, respectively. These analyses, which describe the type and number of small businesses affected, the nature and size of the impacts, and alternatives that minimize these impacts while accomplishing stated objectives, must be published in the *Federal Register* in full or in summary for public comment and submitted to the chief counsel for advocacy of the SBA. Changes to the RFA in June 1996 enable small entities to seek

judicial court review of an agency's compliance with the Act's provisions. The RFA Analysis is included in Section 5.0 herein.

10.12 Small Business Act

The Small Business Act of 1953, as amended, Section 8(a), 15 U.S.C. 634(b)(6), 636(j), 637(a) and (d); Public Laws 95-507 and 99-661, Section 1207; and Public Laws 100-656 and 101-37 are administered by the SBA. The objectives of the act are to foster business ownership by individuals who are both socially and economically disadvantaged; and to promote the competitive viability of such firms by providing business development assistance including, but not limited to, management and technical assistance, access to capital and other forms of financial assistance, business training and counseling, and access to sole source and limited competition federal contract opportunities, to help the firms to achieve competitive viability. Because most businesses associated with fishing are considered small businesses, NMFS, in implementing regulations, must make an assessment of how those regulations will affect small businesses. Implications to small businesses are discussed in the RIR herein.

10.13 Essential Fish Habitat

The amended M-SFCMA included new EFH requirements, and as such, each existing, and any new, FMPs must describe and identify EFH for the fishery, minimize to the extent practicable adverse effects on that EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of that EFH. In 1999, a coalition of several environmental groups brought suit challenging the agency's approval of the EFH FMP amendments prepared by the Gulf of Mexico, Caribbean, New England, North Pacific, and Pacific Fishery Management Councils (American Oceans Campaign et al. v. Daley et al., Civil Action No. 99_982(GK)(D.D.C. September 14, 2000). The court found that the agency's decisions on the EFH amendments were in accordance with the M-SFCMA, but held that the EAs on the amendments were in violation of the NEPA and ordered NMFS to complete new, more thorough NEPA analyses for each EFH amendment in question.

Consequently, NMFS Fisheries entered into a Joint Stipulation with the plaintiff environmental organizations that called for each affected Council to complete EISs rather than EAs for the action of minimizing adverse effects of fishing to the extent practicable on EFH. See AOC v.Evans/Daley et al., Civil No. 99_982 (GK)(D.D.C. December 5, 2001). However, because the court did not limit its criticism of the EAs to only efforts to minimize adverse fishing effects on EFH, it was decided that the scope of these EISs should address all required EFH components as described in Section 303 (a)(7) of the M-SFCMA.

To address these requirements the Council has, under separate action, drafted an EIS to analyze within each fishery a range of potential alternatives to: (1) describe and identify EFH for the fishery; (2) identify other actions to encourage the conservation and enhancement of such EFH; and (3) identify measures to minimize to the extent practicable the adverse effects of fishing on such EFH. Based on the preferred alternatives identified in this EIS, the Council finalized Generic Amendment Number 3 for Addressing the EFH Requirements of the FMPs of the Gulf of Mexico

in March 2005. This amendment, currently under Secretarial Review, would implement the preferred alternatives in accordance with the EFH provisions of the M-SFCMA (See 50 CFR Part 600, Subpart J). The NMFS published the NOA for the FEIS on June 25, 2004 (FR, vol.69, no.122, p.35,598) and the NOA for the ROD on July 29, 2004 (FR, vol.69, no.145, p.45307). There are no implications to EFH in this amendment as discussed in the FONSI.

11.0 LIST OF PREPARERS

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12.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE AMENDMENT/ENVIRONMENTAL ASSESSMENT ARE SENT

Gulf of Mexico Fishery Management Council
Law Enforcement Advisory Panel
Shrimp Advisory Panel
Standing Scientific and Statistical Committee (SSC) and Special Shrimp SSC

Coastal Zone Management Offices
Alabama, Mississippi, Louisiana, Florida, Texas

Other Agencies, Organizations, and Persons
Alabama Cooperative Extension Service
Alabama Department of Conservation and Natural Resources, Marine Resources Division
Center for Marine Conservation
Coastal Conservation Association
Environmental Defense Fund
Florida Department of Environmental Protection
Florida Fish and Wildlife Conservation Commission
Florida Sea Grant
Gulf Restoration Network
Gulf and South Atlantic Fisheries Foundation, Inc.
Louisiana Cooperative Extension Service
Louisiana Department of Wildlife and Fisheries
Mississippi Cooperative Extension Service
Mississippi Department of Marine Resources
Monroe County Commercial Fishermen's Association
Monroe County Cooperative Extension Service
National Marine Fisheries Service Southeast Regional Office
National Marine Fisheries Service Southeast Fisheries Center

National Marine Fisheries Service Washington Office
National Marine Fisheries Service Law Enforcement
National Fisheries Institute
Organized Fishermen of Florida
Recreational Fishing Alliance
ReefKeeper International
Southeastern Fisheries Association
Southern Offshore Fishermen's Association
Texas America Vietnamese Association
Texas Cooperative Extension Service
Texas Parks and Wildlife Department
Texas Shrimp Association
United States Fish & Wildlife Service
United States Coast Guard

13.0 PUBLIC HEARING LOCATIONS AND DATES

Monday, February 14, 2005

Holiday Inn I-10 Bellingrath Gardens
5465 Highway 90 West
Mobile, Alabama 36619
866.436.4329

Tuesday, February 15, 2005

DoubleTree Grand Key Resort
3990 South Roosevelt Boulevard
Key West, Florida 33040
888.310.1540

Tuesday, February 15, 2005

1141 Bayview Drive
Biloxi, Mississippi 39530
228.374.5000

Monday, February 21, 2005

Mississippi Department of Marine Resources
Brownsville Events Center
1 Events Center Boulevard
Brownsville, Texas 78526
956.554.0700

Wednesday, February 16, 2005

LSU Ag Center Extension Office
1105 West Port Street
Abbeville, Louisiana 70510
337.898.4335

Tuesday, February 22, 2005

Palacios Recreational Center
2401 Perryman
Palacios, Texas 77465
361.972.2387

Thursday, February 17, 2005

Wednesday, February 23, 2005

Ramada Inn Houma
1400 West Tunnel Boulevard
Houma, Louisiana 70360
985.879.4871

San Luis Resort
5222 Seawall Boulevard
Galveston Island, Texas 77651
409.744.1500

Thursday, February 17, 2005

DoubleTree Guest Suites Tampa Bay
3050 North Rocky Point Drive
Tampa, Florida 33607
813.888.8800

Thursday, February 24, 2005

New Orleans Airport Ramada Inn
110 James Drive East
Saint Rose, Louisiana 70087
504.466.1355

14.0 REFERENCES

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15.0 TABLES

Table 1. Landings of royal red shrimp from the Gulf of Mexico, 1981 through 2003.

YEAR	POUNDS	VALUE
1981	100,407	$ 258,587
1982	59,220	$ 210,818
1983	77,518	$ 306,364
1984	79,494	$ 259,868
1985	36	$ 176
1986	20,617	$ 55,622
1987	76,475	$ 275,977
1988	66,485	$ 213,680
1989	74,173	$ 278,933
1990	91,406	$ 331,796
1991	94,928	$ 328,642
1992	166,433	$ 585,183
1993	327,090	$1,055,791
1994	336,810	$1,153,340
1995	266,977	$ 954,253
1996	180,158	$ 684,715
1997	202,373	$ 800,261
1998	175,832	$ 665,670
1999	205,354	$ 710,051
2000	260,965	$1,017,627
2001	311,693	$1,253,747
2002	309,298	$1,093,490
2003	270,987	$1,015,194

Table 2. Landings of brown shrimp from the Gulf of Mexico, 1981 through 2003.

YEAR	POUNDS	VALUE
1981	99,512,128	$220,443,699
1982	78,804,488	$231,286,422
1983	61,352,577	$193,347,536
1984	82,048,787	$206,982,758
1985	86,497,848	$193,463,198
1986	98,628,115	$293,011,466
1987	92,047,706	$267,343,008
1988	81,217,045	$243,063,675
1989	94,333,096	$249,655,415
1990	103,371,952	$249,403,357
1991	87,656,161	$251,233,865
1992	69,227,431	$207,374,219
1993	68,163,825	$180,339,109
1994	67,300,351	$249,489,699
1995	77,058,842	$235,074,904
1996	74,483,045	$213,120,935
1997	66,447,212	$239,177,518
1998	79,504,727	$218,140,163
1999	81,489,053	$238,698,128
2000	96,833,227	$354,634,113
2001	88,835,471	$270,014,174
2002	74,234,840	$182,909,894
2003	83,452,629	$176,324,885

Table 3. Landings of white shrimp from the Gulf of Mexico, 1981 through 2003.

YEAR	POUNDS	VALUE
1981	46,108,156	$129,834,584
1982	39,219,608	$138,639,088
1983	42,189,194	$152,583,996
1984	56,030,981	$164,846,139
1985	58,912,565	$159,862,962
1986	70,737,609	$220,652,896
1987	53,445,310	$167,458,557
1988	45,168,515	$129,591,925
1989	36,579,139	$ 98,939,367
1990	44,246,398	$132,382,555
1991	45,800,127	$142,839,499
1992	47,966,491	$140,278,233
1993	39,061,982	$116,011,055
1994	45,967,940	$163,686,805
1995	49,269,752	$170,460,310
1996	35,881,767	$123,420,600
1997	39,110,721	$144,370,803
1998	54,874,117	$181,797,294
1999	54,842,685	$190,996,286
2000	70,207,265	$252,364,219
2001	53,382,611	$170,198,058
2002	53,175,669	$152,855,229
2003	60,911,686	$141,110,433

Table 4. Landings of pink shrimp from the Gulf of Mexico, 1981 through 2003.

YEAR	POUNDS	VALUE
1981	18,773,126	$48,835,586
1982	11,644,028	$41,492,001
1983	12,628,671	$43,007,240
1984	14,646,459	$41,296,486
1985	15,880,287	$46,346,045
1986	11,658,960	$42,908,779
1987	10,412,983	$34,329,063
1988	9,059,329	$29,651,844
1989	8,575,464	$29,730,121
1990	7,381,402	$22,804,224
1991	6,729,595	$23,561,160
1992	6,291,407	$20,785,720
1993	9,407,153	$32,076,867
1994	9,965,079	$36,943,191
1995	13,892,476	$49,788,848
1996	19,067,245	$60,088,838
1997	12,535,506	$53,681,410
1998	16,925,161	$60,851,540
1999	7,936,442	$33,309,359
2000	7,307,376	$33,079,574
2001	9,453,212	$38,936,800
2002	10,230,908	$30,609,675
2003	9,281,136	$27,268,237

Table 5.1 Distribution of Food Shrimp Landings and Revenues Across Unknown and Known Vessels and by Known Vessel Size Category

	Landings (millions of pounds, tails)	Revenues (millions)	Number of vessels	Mean landings per vessel	Mean revenue per vessel
Unknown	13.82	$28.77	N/A	N/A	N/A
Known	131.42	$347.42	8037	16352	$43,228
Large	87.61	$270.23	2261	38748	$119,518
Small	43.81	$77.19	5776	7585	$13,364
Total	145.24	$376.19	N/A	N/A	N/A

Table 5.2 Distribution of Food Shrimp Landings and Revenues Across Permitted and Non-Permitted Vessels by Vessel Size Category

	Landings (millions of pounds, tails)	Revenues (millions)	Number of vessels	Mean landings per vessel	Mean revenue per vessel
Permitted	94.8	$277.58	2951	32125	$94,063
Large	82.45	$255.56	2028	40657	$126,016
Small	12.35	$22.02	923	13381	$23,856
Non-Permitted	36.62	$69.84	5086	7200	$13,732
Large	5.16	$14.67	233	22146	$62,961
Small	31.46	$55.17	4853	6483	$11,368
Total Known	131.42	$347.42	8037	16352	$43,228

Table 5.3 Distribution of Revenues and Selected Statistics for All Permitted Vessels (Alternative A).

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non Shrimp Revenues	Gulf Non Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	2951	2951	2951	2951	2951	2951	2951	2951	2951
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190757	$472,097	$163,620	$473,564	$285,763	$358,565	$473,564	$473,564	100.000
Total	94802066	$277,580,088	$2,292,808	$11,710,134	$1,659,630	$3,264,333	$291,583,030	$296,506,993	N/A
Mean	32125	$94,063	$777	$3,968	$562	$1,106	$98,808	$100,477	78.600
Standard Dev	29412	$91,711	$7,261	$24,628	$9,264	$11,616	$91,686	$91,816	39.900

Table 5.4 Physical Characteristics and Selected Statistics for All Permitted Vessels (Alternative A).[29]

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length (feet)	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	2390	2326	2358	2942	2951	2927	2934	2676	1476
Minimum	1.0	1.0	2.0	0.0	11.0	8.0	10.0	6.0	0.3
Maximum	5.3	5.0	96.3	104.0	131.0	3412.0	80000.0	1860.0	110.0
Total	7880.9	7969.6	116899.1	55539.0	189869.7	1384470.0	31788063.0	275625.0	23815.2
Mean	3.3	3.4	49.6	19.8	64.3	473.0	10834.4	103.0	16.1

[29]The 2002 Vessel Operating Units File (VOUF) was the source of data for hull type, crew size, number of nets, and net size. The Permits database is the source of data for all other characteristics. Characteristics data was not available for every permitted vessel for a variety of reasons. For example, a vessel may not have been found in the VOUF (which only tracks Coast Guard documented vessels), the data may not have ben provided by the permit owner, or the data is not applicable to particular vessels, as is the case with state registered boats and tonnage.

Standard Dev	0.7	0.9	17.8	11.8	16.9	277.8	10089.5	80.6	13.4

Table 5.5 Distribution of Additional Physical Characteristics for All Permitted Vessels (Alternative A)

Hull Type	Percent	Refrigeration	Percent	Gear	Percent
Steel	66.5	Freezer	46.6	Otter Trawl	99.1
Fiberglass	16.8	Ice	51.7	Skimmer Net	0.4
Wood	15.6	Live Well	1.7	Other	0.5
Other	1.1				

Table 5.6 Distribution of Revenues and Selected Statistics for Large Permitted Vessels (Alternative A).

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non Shrimp Revenues	Gulf Non Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of Vessels	2028	2028	2028	2028	2028	2028	2028	2028	2028
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190,757	$472,097	$0	$473,564	$285,763	$358,565	$473,564	$473,564	1.000
Total	82,451,648	$255,560,903	$0	$11,123,569	$1,645,733	$1,171,485	$266,684,472	$269,501,689	N/A
Mean	40,656	$126,016	$0	$5,485	$811	$578	$131,501	$132,890	86.600
Standard Dev	29,492	$92,498	$0	$29,120	$11,166	$10,171	$91,431	$91,485	33.100

Table 5.7 Physical Characteristics and Selected Statistics for Large Permitted Vessels (Alternative A).

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	1869	1830	1856	2026	2028	2020	2025	2025	1048
Minimum	1.0	1.0	2.0	1.0	60.0	8.0	400.0	13.0	0.5
Maximum	5.3	4.0	93.0	53.0	131.0	3412.0	80000.0	1860.0	110.0
Total	6619.8	6798.2	103741.3	36826.0	150034.2	1107527.0	30420125.0	252409.0	20410.7
Mean	3.5	3.7	55.9	18.2	74.0	548.3	15022.3	124.7	19.5
Standard Dev	0.6	0.6	13.0	11.1	8.5	283.5	9464.7	80.6	13.9

Table 5.8 Distribution of Additional Physical Characteristics for Large Permitted Vessels (Alternative A)

Hull Type	Percent	Refrigeration	Percent	Gear	Percent
Steel	82.6	Freezer	64.1	Otter Trawl	99.8
Wood	10.1	Ice	35.9	Other	0.2
Fiberglass	7.2				
Other	0.1				

Table 5.9 Distribution of Revenues and Selected Statistics for Small Permitted Vessels (Alternative A).

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	923	923	923	923	923	923	923	923	923
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	145,822	$160,195	$163,620	$115,789	$7,255	$246,391	$163,620	$246,391	100.000
Total	12,350,328	$22,019,185	$2,292,808	$586,565	$13,897	$2,092,848	$24,898,558	$27,005,304	N/A
Mean	13,381	$23,856	$2,484	$635	$15	$2,267	$26,976	$29,758	61.100
Standard Dev	18,543	$30,348	$12,824	$6,879	$274	$14,224	$31,649	$34,411	47.300

Table 5.10 Physical Characteristics and Selected Statistics for Small Permitted Vessels (Alternative A).

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	521	495	502	916	923	907	909	647	428
Minimum	1.0	1.0	2.0	1.0	11.0	10.0	10.0	6.0	0.3
Maximum	4.2	5.0	96.3	104.0	59.0	3000.0	15000.0	330.0	50.0
Total	1261.1	1171.3	13158.1	21564.0	39835.5	276943.0	1367938.0	23216.0	3404.5
Mean	2.4	2.4	26.2	23.5	43.2	305.3	1504.9	35.9	8.0
Standard Dev	0.5	0.9	13.2	12.5	10.3	171.3	1700.9	23.3	7.3

Table 5.11 Distribution of Additional Physical Characteristics for Small Permitted Vessels (Alternative A)

Hull Type	Percent	Refrigeration	Percent	Gear	Percent
Fiberglass	38.2	Ice	87.1	Otter Trawl	97.3
Steel	30.9	Freezer	7.5	Skimmer Net	1.4
Wood	27.7	Live Well	5.4	Other	1.3
Other	3.2				

	Gulf Food Shrimp Landings	Gulf Food Shrimp Sales
Number of dealers	626	623[30]
Minimum	8	$5
Maximum	5,144,825	$18,072,593
Total	145,244,338	$376,187,828
Mean	232,020	$603,833
Standard Dev	546,239	$1,566,120

Table 5.13 Employment, Production and Value in the Shrimp Processing Sector, 2002.

	Number of Employees	Total Pounds	Total Product Value	Shrimp Pounds	Value of Shrimp	Shrimp As Percent of Total Product Value
Number of Processors	74	74	74	74	74	74
Minimum	0.1	1000	$1	50	$1	0.500
Maximum	470.3	31696059	$105,392,395	29045630	$94,191,819	100.000
Total	4279.9	266839851	$812,297,305	235501671	$734,309,552	
Mean	57.8	3605944	$10,976,991	3182455	$9,923,102	86.200
Standard Dev	87.1	6014371	$19,230,140	5307939	$16,702,891	28.900

N/A

[30] Three dealers did not report the value of their sales.

Table 5.14 Dependency on Gulf Food Shrimp Fishery by Moratorium Alternative, All Permitted versus Active Permitted Vessels, and Vessel Size Category

Alternative	All Permitted Vessels or Active Permitted Vessels Only	Size Category	Percentage of Revenue from Gulf Food Shrimp
A	All	All	78.6
A	All	Large	86.6
A	All	Small	61.1
B	All	All	80.9
B	All	Large	87.6
B	All	Small	63
C	All	All	79.8
C	All	Large	87.3
C	All	Small	61.7
D	All	All	79.8
D	All	Large	87.4
D	All	Small	62.5
A	Active	All	96.8
A	Active	Large	97.8
A	Active	Small	93.8
B	Active	All	95.2
B	Active	Large	97.9
B	Active	Small	86.8
C	Active	All	95.1
C	Active	Large	97.8
C	Active	Small	86.8
D	Active	All	97.1
D	Active	Large	97.8

Table 5.15 Distribution of Revenues and Selected Statistics for Permitted Vessels Under Preferred Alternative B.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non Shrimp Revenues	Gulf Non Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	2666	2666	2666	2666	2666	2666	2666	2666	2666
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190757	$472,097	$163,620	$473,564	$90,204	$246,391	$473,564	$473,564	100.000
Total	90426960	$267,575,643	$2,031,862	$10,879,889	$598,575	$2,764,223	$280,487,394	$283,850,192	N/A
Mean	33906	$100,328	$762	$4,079	$224	$1,036	$105,170	$106,431	80.900
Standard Dev	29603	$92,474	$7,266	$25,458	$3,232	$10,009	$92,328	$92,144	38.200

Table 5.16 Physical Characteristics and Selected Statistics for Permitted Vessels under Preferred Alternative B.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	2227	2168	2199	2664	2666	2660	2665	2455	1324
Minimum	1.0	1.0	2.0	1.0	11.0	8.0	10.0	6.0	0.3
Maximum	5.3	5.0	96.3	104.0	131.0	3412.0	80000.0	1860.0	110.0
Total	7420.8	7556.2	110954.0	52662.0	175192.0	1277169.0	30528944.0	261856.0	21657.6
Mean	3.3	3.5	50.5	19.8	65.7	480.0	11451.3	106.7	16.4
Standard Dev	0.7	0.9	17.5	11.8	16.3	269.2	10144.7	82.2	13.4

Table 5.17 Distribution of Revenues and Selected Statistics for Large Permitted Vessels Under Preferred Alternative B.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non Shrimp Revenues	Gulf Non Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	1934	1934	1934	1934	1934	1934	1934	1934	1934
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190757	$472,097	$0	$473,564	$90,204	$240,975	$473,564	$473,564	100.000
Total	80094902	$249,096,616	$0	$10,487,768	$591,932	$802,048	$259,584,384	$260,978,364	N/A
Mean	41414	$128,799	$0	$5,423	$306	$415	$134,222	$134,942	87.600
Standard Dev	29410	$92,064	$0	$29,571	$3,792	$6,489	$91,037	$90,946	32.000

Table 5.18 Physical Characteristics and Selected Statistics for Large Permitted Vessels under Preferred Alternative B.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	1791	1754	1780	1932	1934	1930	1933	1932	989
Minimum	1.0	1.0	2.0	1.0	60.0	8.0	1000.0	13.0	0.5
Maximum	5.3	4.0	93.0	53.0	131.0	3412.0	80000.0	1860.0	110.0
Total	6366.7	6557.2	99857.4	34926.0	143344.0	1054625.0	29400495.0	242943.0	19073.7
Mean	3.6	3.7	56.1	18.1	74.1	546.4	15209.8	125.7	19.3
Standard Dev	0.6	0.6	12.9	11.1	8.4	268.8	9456.5	81.9	13.8

Table 5.19 Distribution of Revenues and Selected Statistics for Small Permitted Vessels Under Preferred Alternative B.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	732	732	732	732	732	732	732	732	732
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	145822	$160,195	$163,620	$86,835	$3,447	$246,391	$163,620	$246,391	100.000
Total	10332058	$18,479,027	$2,031,862	$392,121	$6,643	$1,962,175	$20,903,010	$22,871,828	N/A
Mean	14096	$25,210	$2,772	$535	$9	$2,677	$28,517	$31,203	63.000
Standard Dev	19125	$31,154	$13,663	$5,826	$151	$15,809	$32,369	$35,588	46.600

Table 5.20 Physical Characteristics and Selected Statistics for Small Permitted Vessels under Preferred Alternative B.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	436	414	419	732	732	730	732	523	335
Minimum	1.0	1.0	2.0	1.0	11.0	10.0	10.0	6.0	0.3
Maximum	4.2	5.0	96.3	104.0	59.0	3000.0	15000.0	330.0	50.0
Total	1054.0	999.0	11096.5	17736.0	31848.0	222544.0	1128449.0	18913.0	2583.9
Mean	2.4	2.4	26.5	24.2	43.5	304.7	1539.7	36.2	7.7
Standard Dev	0.5	0.9	13.5	12.7	10.2	174.9	1726.8	24.6	6.8

Table 5.21 Distribution of Revenues and Selected Statistics for Permitted Vessels Under Alternative C.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	2790	2790	2790	2790	2790	2790	2790	2790	2790
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190757	$472,097	$163,620	$473,564	$90,204	$246,391	$473,564	$473,564	100.000
Total	92625098	$272,405,999	$2,292,808	$11,258,949	$613,856	$2,863,414	$285,957,756	$289,435,026	N/A
Mean	33187	$97,602	$822	$4,034	$220	$1,026	$102,457	$103,703	79.800
Standard Dev	29511	$92,137	$7,464	$25,074	$3,164	$9,830	$92,020	$91,852	39.000

Table 5.22 Physical Characteristics and Selected Statistics for Permitted Vessels under Alternative C.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	2302	2238	2271	2787	2790	2782	2789	2543	1384
Minimum	1.0	1.0	2.0	1.0	11.0	8.0	10.0	6.0	0.3
Maximum	5.3	5.0	96.3	104.0	131.0	3412.0	80000.0	1860.0	110.0
Total	7637.5	7737.2	113527.3	55102.0	181389.0	1327226.0	31082824.0	267556.0	22439.3
Mean	3.3	3.5	50.0	19.8	65.0	477.0	11140.9	105.2	16.2
Standard Dev	0.7	0.9	17.7	11.8	16.7	279.5	10143.4	81.6	13.4

Table 5.23 Distribution of Revenues and Selected Statistics for Large Permitted Vessels Under Alternative C.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	1973	1973	1973	1973	1973	1973	1973	1973	1973
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190757	$472,097	$0	$473,564	$90,204	$240,975	$473,564	$473,564	100.000
Total	81229195	$252,189,912	$0	$10,751,040	$599,958	$803,345	$262,940,952	$264,344,255	N/A
Mean	41170	$127,821	$0	$5,449	$304	$407	$133,270	$133,981	87.300
Standard Dev	29415	$92,184	$0	$29,832	$3,756	$6,425	$91,197	$91,075	32.300

Table 5.24 Physical Characteristics and Selected Statistics for Large Permitted Vessels under Alternative C.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	1828	1790	1816	1971	1973	1967	1972	1970	1011
Minimum	1.0	1.0	2.0	1.0	60.0	8.0	400.0	13.0	0.5
Maximum	5.3	4.0	93.0	53.0	131.0	3412.0	80000.0	1860.0	110.0
Total	6492.3	6671.1	101636.2	35677.0	146134.1	1078621.0	29852525.0	246959.0	19546.7
Mean	3.6	3.7	56.4	18.1	74.1	548.3	15138.2	125.4	19.3
Standard Dev	0.6	0.6	13.0	11.0	8.4	283.7	9480.1	81.3	13.9

Table 5.25 Distribution of Revenues and Selected Statistics for Small Permitted Vessels Under Alternative C.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	817	817	817	817	817	817	817	817	817
Minimum	0	$0	$0	$0	$0	$0	$34	$43	0.000
Maximum	145822	$160,195	$163,620	$115,789	$7,255	$246,391	$163,620	$246,391	100.000
Total	11395903	$20,216,087	$2,292,808	$507,909	$13,897	$2,060,069	$23,016,805	$25,090,771	N/A
Mean	13931	$24,714	$2,803	$621	$17	$3,518	$28,138	$30,673	61.700
Standard Dev	18988	$30,891	$13,591	$6,833	$291	$15,073	$32,194	$35,163	47.000

Table 5.26 Physical Characteristics and Selected Statistics for Small Permitted Vessels under Alternative C.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	474	448	455	816	817	815	817	573	373
Minimum	1.0	1.0	2.0	1.0	11.0	10.0	10.0	6.0	0.3
Maximum	4.2	5.0	96.3	104.0	59.0	3000.0	15000.0	330.0	50.0
Total	1145.2	1066.2	11891.1	19425.0	35255.0	248830.0	1230299.0	20597.0	2892.6
Mean	2.4	2.4	26.1	23.8	43.1	305.4	1504.2	35.9	7.8
Standard Dev	0.5	0.9	13.4	12.5	10.4	174.5	1695.0	24.0	6.9

Table 5.27 Distribution of Revenues and Selected Statistics for Permitted Vessels Under Alternative D.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	2604	2604	2604	2604	2604	2604	2604	2604	2604
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190757	$472,097	$163,620	$473,564	$285,763	$358,565	$473,564	$473,564	100.000
Total	86688014	$253,658,586	$1,933,516	$8,841,417	$1,528,487	$2,931,157	$264,433,519	$268,893,163	N/A
Mean	33290	$97,411	$743	$3,395	$587	$1,121	$101,549	$103,262	79.800
Standard Dev	29671	$92,479	$7,296	$22,323	$9,743	$11,420	$92,423	$92,519	39.200

Table 5.28 Physical Characteristics and Selected Statistics for Permitted Vessels under Alternative D.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	2130	2072	2102	2596	2604	2581	2588	2365	1321
Minimum	1.0	1.0	2.0	0.0	11.0	8.0	10.0	6.0	0.5
Maximum	5.3	5.0	96.3	76.0	131.0	3412.0	80000.0	1860.0	110.0
Total	7075.0	7113.2	104633.0	51227.0	167956.7	1227883.0	28427131.0	245910.0	21459.8
Mean	3.3	3.4	49.8	19.7	64.6	475.7	10989.2	104.0	16.3
Standard Dev	0.7	0.9	17.8	11.6	16.8	279.0	10114.0	83.9	13.4

Table 5.29 Distribution of Revenues and Selected Statistics for Large Permitted Vessels Under Alternative D.

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	1804	1804	1804	1804	1804	1804	1804	1804	1804
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	190757	$472,097	$0	$473,564	$285,763	$358,565	$473,564	$473,564	100.000
Total	75440297	$233,739,662	$0	$8,418,336	$1,517,513	$892,827	$242,157,988	$244,568,398	N/A
Mean	41818	$129,567	$0	$4,667	$841	$495	$134,234	$135,570	87.400
Standard Dev	29515	$92,468	$0	$26,388	$11,696	$9,167	$91,587	$91,663	32.200

Table 5.30 Physical Characteristics and Selected Statistics for Large Permitted Vessels under Alternative D.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	1667	1631	1656	1800	1801	1795	1800	1798	951
Minimum	1.0	1.0	2.0	1.0	60.0	8.0	400.0	13.0	0.5
Maximum	5.3	4.0	93.0	53.0	131.0	3412.0	80000.0	1860.0	110.0
Total	5904.5	6081.2	92873.7	32900.0	133344.2	985026.0	27201336.0	225528.0	18565.2
Mean	3.5	3.7	56.0	18.2	73.9	548.5	15110.1	125.2	19.5
Standard Dev	0.6	0.6	13.0	11.0	8.5	284.5	9468.9	84.6	13.9

Table 5.31 Distribution of Revenues and Selected Statistics for Small Permitted Vessels Under Alternative D

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non_Shrimp Revenues	Gulf Non_Shrimp Revenues	Total Shrimp Revenues	Total Revenues	Percentage of Revenue from Gulf Food Shrimp
Number of vessels	800	800	800	800	800	800	800	800	800
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0.000
Maximum	145822	$160,195	$163,620	$115,789	$7,255	$246,391	$163,620	$246,391	100.000
Total	11247717	$19,918,924	$1,923,516	$423,081	$10,914	$2,038,331	$22,275,521	$24,324,765	N/A
Mean	14060	$24,898	$2,417	$529	$14	$2,548	$27,844	$30,406	62.500
Standard Dev	19178	$31,114	$13,015	$6,350	$84	$15,241	$32,382	$35,418	47.100

Table 5.32 Physical Characteristics and Selected Statistics for Small Permitted Vessels under Alternative D.

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	460	438	443	794	800	785	787	564	370
Minimum	1.0	1.0	2.0	0.0	11.0	10.0	10.0	6.0	0.3
Maximum	4.2	5.0	96.3	76.0	59.0	3000.0	15000.0	330.0	50.0
Total	1120.5	1032.2	11759.3	18327.0	34612.0	242857.0	1213795.0	20382.0	2908.9
Mean	2.4	2.4	26.5	23.1	43.3	309.4	1542.3	36.1	7.9
Standard Dev	0.5	0.9	13.4	12.1	10.3	176.3	1757.3	24.2	7.3

Table 5.33 Distribution of Revenues and Selected Statistics for Gulf Royal Red Shrimp Vessels

	Gulf Food Shrimp Landings	Gulf Food Shrimp Revenues	Gulf Bait Shrimp Revenues	S. Atlantic Shrimp Revenues	S. Atlantic Non Shrimp Revenues	Gulf Non Shrimp Revenues	Total Revenues	Royal Red Landings	Royal Red Revenues	Percentage of Revenue from Royal Reds
Number of vessels	15	15	15	14	14	14	14	15	15	14
Minimum	2686	$8,846	$0	$0	$0	$0	$55,981	53	$106	0.300
Maximum	137981	$471,180	$0	$156,270	$789	$238	$471,180	99117	$412,490	87.500
Total	975559	$2,881,361	$0	$436,648	$1,054	$238	$3,258,945	324190	$1,185,410	N/A
Mean	65037	$192,091	$0	$31,189	$75	$17	$232,782	21613	$79,027	29.300
Standard Dev	39755	$134,352	$0	$54,080	$217	$64	$120,052	28694	$114,027	25.800

Table 5.34 Physical Characteristics and Selected Statistics for Gulf Royal Red Shrimp Vessels

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	14	13	14	14	14	14	14	14	6
Minimum	2.5	3.3	34.7	4.0	48.0	350.0	2500.0	42.0	1.0
Maximum	4.0	4.0	80.0	49.0	131.0	1720.0	35000.0	205.0	40.0
Total	52.7	51.3	852.6	186.0	1167.0	10573.0	294500.0	2083.0	124.5
Mean	3.8	3.9	60.9	13.3	83.4	755.2	21035.7	148.8	20.8
Standard Dev	0.5	0.2	14.1	12.7	17.2	312.7	7571.4	40.4	15.5

City	State	Number of Permit Owners
BROWNSVILLE	TX	143
PORT ISABEL	TX	139
PALACIOS	TX	103
PORT ARTHUR	TX	98
BILOXI	MS	98
BAYOU LA BATRE	AL	80
CUT OFF	LA	74
FREEPORT	TX	74
PORT LAVACA	TX	59
CHAUVIN	LA	57
NEW ORLEANS	LA	54
FORT MYERS BEACH	FL	51
HOUMA	LA	51
ARANSAS PASS	TX	50
ABBEVILLE	LA	49
OCEAN SPRINGS	MS	48
IRVINGTON	AL	38
HOUSTON	TX	34
PANAMA CITY	FL	33
DULAC	LA	31
GALLIANO	LA	30
CODEN	AL	30
PENSACOLA	FL	30
LAFAYETTE	LA	29
GRAND ISLE	LA	29
HUDSON	FL	27
D'IBERVILLE	MS	26
CAMERON	LA	25
HARVEY	LA	25
TAMPA	FL	24
FORT MYERS	FL	22
SPRING HILL	FL	21
PASS CHRISTIAN	MS	21
BEAUMONT	TX	20

NEDERLAND	TX	20
BURAS	LA	19
GROVES	TX	18
GULFPORT	MS	17
APALACHICOLA	FL	17
LAFITTE	LA	17
KEY WEST	FL	16
ERATH	LA	16
VENICE	LA	16
MOBILE	AL	16
THEODORE	AL	15
ATLANTIC BEACH	FL	15
NEW PORT RICHEY	FL	15
GRAND BAY	AL	15
MONTEGUT	LA	15
GOLDEN MEADOW	LA	15
ROCKPORT	TX	15
BACLIFF	TX	14
PEARLAND	TX	14
GALVESTON	TX	14
LAROSE	LA	13
AVONDALE	LA	12
PORT O'CONNOR	LA	12
LEAGUE CITY	TX	12
PASCAGOULA	MS	12
MARRERO	MS	12
TARPON SPRINGS	FL	12
DICKINSON	TX	12
ORANGE	TX	11
BAY ST. LOUIS	MS	11
CARRABELLE	FL	10
FAIRHOPE	AL	10
LONG BEACH	MS	10
BARATARIA	LA	10
LOCKPORT	LA	10
ST. PETERSBURG	FL	10

FOLEY	AL	9
BOOTHVILLE	LA	9
LOS FRESNOS	TX	9
MIAMI	FL	9
CRYSTAL RIVER	FL	9
INGLIS	FL	9
NEW IBERIA	LA	9
MORGAN CITY	FL	9
PORT NECHES	TX	8
PORT RICHEY	FL	8
KAPLAN	LA	8
LOWLAND	NC	8
JACKSONVILLE	FL	8
GRETNA	LA	7
BATON ROUGE	LA	7
BOURG	LA	7
MAYPORT	FL	7
NICEVILLE	FL	7
WESTWEGO	LA	7
CHALMETTE	LA	7
EMPIRE	LA	7
FRIENDSWOOD	TX	6
HERNANDO BEACH	FL	6
METAIRIE	LA	6
OLMITO	TX	6
SEABROOK	TX	6
SEADRIFT	TX	6
SULPHUR	LA	6
WAVELAND	MS	6
BROOKSVILLE	FL	6
DUNNELLON	FL	6
CARROLLTON	TX	6
LAKE CHARLES	LA	6
YOUNGSVILLE	LA	6
SNEADS FERRY	NC	6
GARLAND	TX	5

LAGUNA VISTA	TX	5
ARLINGTON	TX	5
AUSTIN	TX	5
PANACEA	FL	5
PASADENA	TX	5
SABINE PASS	TX	5
SOUTHPORT	FL	5
BRADENTON	FL	5
BREAUX BRIDGE	FL	5
FULTON	TX	5
BRIDGE CITY	TX	5
GAUTIER	MS	5
LAKE JACKSON	TX	5
ODESSA	FL	5
SLIDELL	LA	5
ORIENTAL	NC	5
DAUPHIN ISLAND	AL	5
HOMOSASSA	FL	4
CRYSTAL BEACH	TX	4
MATAGORDA	TX	4
NEW BERN	NC	4
EAST POINT	FL	4
ESTERO	FL	4
AMELIA	LA	4
ST. BERNARD	LA	4
SUPPLY	NC	4
TEXAS CITY	TX	4
VICTORIA	TX	4
BELLE CHASE	LA	4
PATTERSON	LA	4
BOKEELIA	FL	4
COCOA BEACH	FL	3
CORTEZ	FL	3
CRAWFORDVILLE	FL	3
CRESCENT	GA	3
GLOUCESTER	MA	3

MATLACHA	FL	3
MOUNT PLEASANT	SC	3
N. FORT MYERS	FL	3
NEWPORT NEWS	VA	3
ANAHUAC	TX	3
PORT ARANSAS	TX	3
PUNTA GORDA	FL	3
SUGAR LAND	TX	3
THIBODAUX	LA	3
CAPE CANAVERAL	FL	3
MOSS POINT	MS	3
PORT BOLIVAR	TX	3
ARLINGTON	TN	2
AURORA	NC	2
AUSO VIEJO	CA	2
BRANDON	FL	2
CANTONMENT	FL	2
ALLEN	TX	2
CEDAR LANE	TX	2
CHANNELVIEW	TX	2
CLAXTON	GA	2
CLEVELAND	TX	2
CLUTE	TX	2
CORPUS CHRISTI	TX	2
CREOLE	LA	2
DALLAS	TX	2
DELCAMBRE	LA	2
FORT WALTON BEACH	FL	2
FORT WORTH	TX	2
GIBSON	LA	2
GRAND PRAIRIE	TX	2
HORSESHOE BEACH	FL	2
HUMBLE	TX	2
INVERNESS	FL	2
LAUDERHILL	FL	2
LIBERTY	TX	2

LONG BEACH	CA	2
LULING	LA	2
LYNN HAVEN	FL	2
MADEIRA BEACH	FL	2
MCCLELLANVILLE	SC	2
ALLEN	TX	2
NEW SMYRNA BEACH	FL	2
ALVIN	TX	2
PLANT CITY	FL	2
PLAQUEMINES	LA	2
AMA	LA	2
PORT CHARLOTTE	FL	2
ROBERTSDALE	AL	2
SAN LEON	TX	2
SARALAND	AL	2
SHALLOTTE	NC	2
SOPCHOPPY	FL	2
TERRYTOWN	LA	2
VILLE PLATTE	LA	2
WAPPINGERS FALLS	NY	2
WEWAHITCHKA	FL	2
YANKEETOWN	FL	2
YULEE	FL	2
SCOTT	LA	2
BERWICK	LA	2
BAYTOWN	TX	2
BRIDGE CITY	LA	2
FRANKLIN	LA	2
JEANERETTE	LA	2
NAPLES	FL	2
VIOLET	LA	2
ADDIS	LA	1
ALEXANDRIA	LA	1
BONITA SPRINGS	FL	1
BRANFORD	FL	1
BRAZORIA	TX	1

BROOKFIELD	IL	1
BRUCE	FL	1
BRUNSWICK	GA	1
CHARENTON	LA	1
CHATOM	AL	1
CHICAGO	IL	1
CITRONELLE	AL	1
CLEARWATER	FL	1
CLERMONT	FL	1
COCONUT CREEK	FL	1
COUSHATTA	LA	1
DAYTON	TX	1
DIAMOND HEAD	MS	1
DUNEDIN	FL	1
EAST KINGSTON	NH	1
EDISTO BEACH	SC	1
ELBERTA	AL	1
ENGLEWOOD	FL	1
EUSTIS	FL	1
FORT LAUDERDALE	FL	1
ARCADIA	FL	1
GOLIAD	TX	1
GRAND CHENIER	LA	1
GRANTSBORO	NC	1
GRAY	LA	1
GUEYDAN	LA	1
HIGH ISLAND	TX	1
HITCHCOCK	TX	1
HOBUCKEN	NC	1
HOLIDAY	FL	1
HOMOSASSA SPRINGS	FL	1
HORTENSE	GA	1
INGLESIDE	TX	1
IOWA	LA	1
JAYESS	MS	1
ARIPEKA	FL	1

KENNER	LA	1
KILN	MS	1
LA MARQUE	TX	1
LAKE PANASOFKEE	FL	1
LAKESHORE	MS	1
LECANTO	FL	1
LEHIGH ACRES	FL	1
LINCOLNVILLE	SC	1
LOXLEY	AL	1
LUTZ	FL	1
LYONS	GA	1
MARY ESTHER	FL	1
MEMPHIS	TN	1
MERRITT ISLAND	FL	1
MIMS	FL	1
MISSOURI CITY	TX	1
MORRISTON	FL	1
ASTOR	FL	1
NORTH MIAMI	FL	1
NORTH RICHLAND	TX	1
OCALA	FL	1
OLD OCEAN	TX	1
OPELOUSAS	LA	1
ORANGE BEACH	AL	1
ORLANDO	FL	1
PEARL RIVER	LA	1
PETAL	MS	1
PFLUGERVILLE	TX	1
PHILADELPHIA	PA	1
PICAYUNE	MS	1
PIERRE PART	LA	1
PORT ORANGE	FL	1
PORTLAND	TX	1
RICHLAND HILL	TX	1
RICHMOND HILL	GA	1
RIVERVIEW	FL	1

ROBSTOWN	TX	1
RUTH	MS	1
SALEM	AL	1
SAN ANTONIO	TX	1
SAN DIEGO	CA	1
SANTA FE	TX	1
SAUCIER	MS	1
SELMA	AL	1
SILVER SPRINGS	FL	1
SILVERHILL	AL	1
SOUR LAKE	TX	1
SOUTHBEND	WA	1
SPANISH FORT	AL	1
ST MARYS	GA	1
ST. AUGUSTINE	FL	1
ST. JAMES CITY	FL	1
STAFFORD	TX	1
STEINHATCHEE	FL	1
SUWANEE	GA	1
SUWANNEE	FL	1
SWEENY	TX	1
TORRANCE	CA	1
VALRICO	FL	1
VENICE	FL	1
VINTON	LA	1
BALDWIN	LA	1
WADMALAW ISLAND	SC	1
WEBSTER	TX	1
WELSH	LA	1
WEST COLUMBIA	TX	1
WINNIE	TX	1
BAY CITY	TX	1
BROOKINGS	OR	1
DONNER	LA	1
LARGO	FL	1
MANSURA	LA	1

YOUNGSVILLE	LA	1

Table 6.2 Gulf Food Shrimp Landings, Sales, and Number of Dealers by Select Communities, Ranked by Sales in 2002[31]

City	State	Gulf Food Shrimp Landings	Gulf Food Shrimp Sales	Number of Dealers
PALACIOS	TX	9128642	$29,394,538	12
BROWNSVILLE	TX	7424461	$26,589,733	6
PORT ARTHUR	TX	7030587	$24,561,199	5
ABBEVILLE	LA	7564000	$24,050,092	11
BILOXI	MS	7100985	$21,723,205	8
DULAC	LA	8679610	$18,049,903	7
BAYOU LA BATRE	AL	5584105	$18,008,927	12
PORT ISABEL	TX	4560784	$15,974,978	11
GOLDEN MEADOW	LA	5308548	$11,522,274	15
EMPIRE	LA	5700955	$10,894,648	7
FT MYERS BEACH	FL	2881431	$10,465,572	4
GRAND ISLE	LA	5756182	$9,788,842	6
PORT BOLIVAR	TX	2983593	$9,056,035	6
FREEPORT	TX	***	***	2
VENICE	LA	4818065	$8,004,537	7
KEY WEST	FL	***	***	2
LAFITTE	LA	3433159	$7,437,816	8
ARANSAS PASS	TX	2610832	$7,167,594	8
BOOTHVILLE	LA	***	***	1
GALVESTON	TX	2158985	$6,668,992	6
BON SECOUR	AL	1798830	$6,094,617	7
CHAUVIN	LA	3545496	$5,863,647	21
SABINE PASS	TX	1619724	$5,251,387	3
CUT OFF	LA	1946210	$4,716,566	10
TAMPA	FL	1268290	$4,649,453	4
LAKESHORE	MS	1971012	$4,354,315	3
LOCKPORT	LA	1713054	$4,235,322	3
MARRERO	LA	2080281	$3,679,988	5
HOUMA	LA	2251071	$3,611,169	16
ST BERNARD	LA	1683366	$3,343,868	13
BELLE CHASSE	LA	1456710	$2,707,776	3

[31]For communities where the number of dealers is less than three, landings and sales are suppressed to protect firms' confidential data. Only communities with more than $250,000 in landings were selected for presentation.

DELCAMBRE	LA	1753259	$2,566,388	8
TARPON SPRINGS	FL	854639	$2,394,509	3
IRVINGTON	AL	567285	$2,174,108	5
SAN LEON	TX	1228318	$1,943,318	8
APALACHICOLA	FL	778545	$1,933,317	8
NEW ORLEANS	LA	798901	$1,811,816	12
THERIOT	LA	1159039	$1,653,589	8
MONTEGUT	LA	992417	$1,526,929	9
SEABROOK	TX	***	***	2
DICKINSON	TX	739989	$1,450,076	3
CODEN	AL	546561	$1,266,871	6
GULFPORT	MS	473634	$1,261,662	3
PASCAGOULA	MS	471987	$1,240,412	4
FULTON	TX	711170	$1,192,078	5
PT ST JOE	FL	***	***	2
GRAND BAY	AL	***	***	2
PASS CHRISTIAN	MS	428362	$992,644	4
CARRABELLE	FL	***	***	2
PORT SULPHUR	LA	668917	$975,883	3
MORGAN CITY	LA	394340	$917,178	6
THEODORE	AL	389009	$842,049	3
PENSACOLA	FL	301781	$780,664	6
SEADRIFT	TX	502022	$770,353	5
GRAND CHENIER	LA	***	***	1
SPRING HILL	FL	***	***	2
TEXAS CITY	TX	398875	$670,091	5
ANAHUAC	TX	***	***	2
HACKBERRY	LA	504103	$627,423	5
BAYTOWN	TX	419215	$619,905	3
CRYSTAL BEACH	TX	***	***	1
PORT LAVACA	TX	330349	$507,985	4
BARATARIA	LA	***	***	2
ST PETERSBURG	FL	148374	$472,074	4
YANKEETOWN	FL	***	***	2
OCEAN SPRINGS	MS	***	***	1
VIOLET	LA	***	***	1
PORT O'CONNOR	TX	150326	$256,349	4

Table 6.3 Number of Vessels Supplying Shrimp to Selected Communities, 2002.

City	State	Number of Vessels
DULAC	LA	780
GOLDEN MEADOW	LA	727
GRAND ISLE	LA	621
LAFITTE	LA	608
VENICE	LA	576
CHAUVIN	LA	536
EMPIRE	LA	460
HOUMA	LA	400
NEW ORLEANS	LA	326
PORT ARTHUR	TX	301
BAYOU LA BATRE	AL	264
CUT OFF	LA	255
ABBEVILLE	LA	251
PORT SULPHUR	LA	247
PALACIOS	TX	238
MONTEGUT	LA	222
BILOXI	MS	222
DELCAMBRE	LA	219
THERIOT	LA	212
KEY WEST	FL	204
FREEPORT	TX	195
BELLE CHASSE	LA	194
CROWN POINT	LA	193
BROWNSVILLE	TX	192
BOOTHVILLE	LA	171
CAMERON	LA	168
PORT BOLIVAR	TX	167
LOCKPORT	LA	163
SABINE PASS	TX	159
ARANSAS PASS	TX	142
ST BERNARD	LA	136
DELACROIX	LA	133
PORT ISABEL	TX	128
FT MYERS BEACH	FL	124
GALVESTON	TX	118

LAKESHORE	MS	100

Table 6.4 Number of Permitted Vessels Supplying Shrimp to Selected Communities, 2002.

City	State	Number of Permitted Vessels
PORT ARTHUR	TX	249
DULAC	LA	238
PALACIOS	TX	206
BAYOU LA BATRE	AL	201
ABBEVILLE	LA	184
KEY WEST	FL	178
GRAND ISLE	LA	178
BROWNSVILLE	TX	174
FREEPORT	TX	172
GOLDEN MEADOW	LA	162
BILOXI	MS	156
SABINE PASS	TX	125
VENICE	LA	123
PORT ISABEL	TX	120
PORT BOLIVAR	TX	116
FT MYERS BEACH	FL	112
BOOTHVILLE	LA	111
GALVESTON	TX	106
ARANSAS PASS	TX	104
DELCAMBRE	LA	97
CHAUVIN	LA	93
CAMERON	LA	77
CUT OFF	LA	77
HOUMA	LA	68
EMPIRE	LA	66
TAMPA	FL	61
BON SECOUR	AL	54
LOCKPORT	LA	50
CODEN	AL	49
NEW ORLEANS	LA	45
LAFITTE	LA	44
LAKESHORE	MS	41
LAKE CHARLES	LA	41

GULFPORT	MS	29
TARPON SPRINGS	FL	28

Table 6.5 Processed Pounds, Value, and Employment of Gulf Shrimp Processors in 2002, Ranked by Processed Shrimp Value.

City	State	Number of Processors	Total Processed Pounds	Total Processed Value	Processed Shrimp Pounds	Processed Shrimp Value	Average Employment	Shrimp as Percent of Processed Value
LAKELAND	FL	1	***	***	***	***	***	0.894
BROWNSVILLE	TX	2	***	***	***	***	***	1.000
DELCAMBRE	LA	4	24315482	$78,844,688	24315482	$78,844,688	181.6	1.000
BILOXI	MS	8	26358881	$71,714,629	26340287	$71,646,629	324.8	0.999
DOVER	FL	1	***	***	***	***	***	0.713
BAYOU LA BATRE	AL	8	23948634	$76,713,366	17848164	$68,308,728	341.8	0.890
TAMPA	FL	1	***	***	***	***	***	0.728
DULAC	LA	6	11701706	$30,677,828	11692346	$30,660,044	146.9	0.999
PORT ARTHUR	TX	1	***	***	***	***	***	1.000
NEW ORLEANS	LA	1	***	***	***	***	***	1.000
PORT ISABEL	TX	1	***	***	***	***	***	1.000
D'IBERVILLE	MS	1	***	***	***	***	***	1.000
BON SECOUR	AL	2	***	***	***	***	***	0.895
CHAUVIN	LA	6	5241720	$14,187,226	5241720	$14,187,226	122.3	1.000
MOBILE	AL	1	***	***	***	***	***	1.000
ST PETERSBURG	FL	2	***	***	***	***	***	0.611
BEAUMONT	TX	1	***	***	***	***	***	1.000
VIOLET	LA	1	***	***	***	***	***	1.000
PASCAGOULA	MS	2	***	***	***	***	***	0.935
SAN BENITO	TX	1	***	***	***	***	***	1.000
PALACIOS	TX	1	***	***	***	***	***	1.000
GOLDEN MEADOW	LA	2	***	***	***	***	***	1.000
PORT ST JOE	FL	1	***	***	***	***	***	1.000
OCEAN SPRINGS	MS	1	***	***	***	***	***	1.000
HACKBERRY	LA	1	***	***	***	***	***	1.000
APALACHICOLA	FL	4	1138529	$3,290,681	1012529	$2,743,481	34.3	0.834
HARAHAN	LA	1	***	***	***	***	***	1.000

KEMAH	TX	1	***	***	***	***	***	0.252
MONTEGUT	LA	1	***	***	***	***	***	1.000
CARRABELLE	FL	1	***	***	***	***	***	1.000
THERIOT	LA	1	***	***	***	***	***	1.000
DALLAS	TX	1	***	***	***	***	***	0.112
SARALAND	AL	1	***	***	***	***	***	0.066
PENSACOLA	FL	1	***	***	***	***	***	1.000
PORT O'CONNOR	TX	1	***	***	***	***	***	0.153
PANACEA	FL	1	***	***	***	***	***	0.048
HOUMA	LA	1	***	***	***	***	***	0.435
CHENIER	LA	1	***	***	***	***	***	1.000
SEADRIFT	TX	1	***	***	***	***	***	0.005

Rank	City	State
1	BROWNSVILLE	TX
2	PORT ARTHUR	TX
3	PORT ISABEL	TX
4	PALACIOS	TX
5	BILOXI	MS
6	BAYOU LA BATRE	AL
7	DULAC	LA
8	CHAUVIN	LA
9	FREEPORT	TX
10	ABBEVILLE	LA
11	CUT OFF	LA
12	GOLDEN MEADOW	LA
13	NEW ORLEANS	LA
14	GRAND ISLE	LA
15	FT MYERS BEACH	FL
16	HOUMA	LA
17	ARANSAS PASS	TX
18	VENICE	LA
19	KEY WEST	FL
20	DELCAMBRE	LA
21	TAMPA	FL
22	BON SECOUR	AL
23	LAFITTE	LA
24	EMPIRE	LA
25	PORT BOLIVAR	TX
26	CAMERON	LA
27	GALVESTON	TX
28	BOOTHVILLE	LA
29	SABINE PASS	TX
30	MONTEGUT	LA
31	IRVINGTON	AL
32	CODEN	AL
33	PORT LAVACA	TX
34	APALACHICOLA	FL
35	OCEAN SPRINGS	MS
36	LOCKPORT	LA

Group 1	Group 2	Group 3
Palacios	Abbeville	Grand Isle
Dulac	Port Arthur	Delcambre
Bayou La Batre	Golden Meadow	
Port Isabel	Venice	
Empire	Freeport	
Boothville	Lafitte	
Coden	Aransas Pass	
	Cameron	
	Apalachicola	
	Port Lavaca	
	Houma	
Chauvin		

Montegut

Brownsville

Galveston

City	Number of Impacted Vessels	Number of Impacted Dealers	Loss of Shrimp Revenue	Percentage Loss of Shrimp Revenue
Abbeville	6	6	$483,799	2
Barataria	1	1	$3,361	0.7
Bayou La Batre	1	1	$4,009	0
Biloxi	4	2	$133,833	0.6
Bon Secour	3	3	$13,356	0.2
Brownsville	1	1	$89,563	0.3
Cameron	2	1	$36,191	1.5
Crystal Beach	2	1	$48,041	8.9
Crystal River	1	1	$558	0.7
Cut Off	1	1	$80,386	1.7
Delcambre	1	1	$33,210	1.3
Dulac	5	2	$176,669	1.2
Franklin	1	1	$250	0.3
Freeport	6	1	$102,965	1.2
Ft. Myers Beach	1	1	$23,905	0.2
Fulton	1	1	$8,047	0.7
Galveston	6	1	$49,968	0.7
Golden Meadow	5	3	$5,577	0
Grand Chenier	2	1	$90,300	11.8
Houma	1	1	$17,144	0.4
Key West	11	2	$181,232	2.4
Lafitte	5	2	$18,260	0.2
Lockport	1	1	$620	0
Matagorda	1	1	$926	0.5

Pascagoula	3	1	$85,731	6.9
Port Arthur	12	5	$779,799	3.2
Port Bolivar	3	3	$103,797	1.1
Port Isabel	1	1	$882	0
Sabine Pass	3	3	$47,947	0.9
St. Petersburg	2	1	$42,854	11.1
Tampa	4	2	$140,578	3
Tarpon Springs	1	1	$56,361	2.4
Venice	1	1	$13,981	0.2

Table 6.9 Community Impacts Under Alternative C (Assumption 1)

City	Number of Impacted Vessels	Number of Impacted Dealers	Loss of Shrimp Revenue	Percentage Loss of Shrimp Revenue
Abbeville	5	5	$470,624	2
Barataria	1	1	$3,361	0.7
Bayou La Batre	1	1	$4,009	0
Biloxi	2	1	$83,111	0.4
Bon Secour	3	3	$13,356	0.2
Brownsville	1	1	$89,563	0.3
Cameron	2	1	$36,191	1.5
Crystal Beach	2	1	$48,041	8.9
Crystal River	1	1	$558	0.7
Cut Off	1	1	$80,386	1.7
Delcambre	1	1	$33,210	1.3
Dulac	4	2	$171,825	1.2

Freeport	2	1	$68,563	0.8
Galveston	2	1	$13,382	0.2
Golden Meadow	5	3	$5,577	0
Grand Chenier	2	1	$90,300	11.8
Houma	1	1	$17,144	0.4
Key West	3	2	$33,100	0.4
Lafitte	5	2	$18,260	0.2
Lockport	1	1	$620	0
Matagorda	1	1	$926	0.5
Palacios	5	3	$250,933	0.9
Pascagoula	1	1	$630	0
Port Arthur	4	4	$421,763	1.7
Port Bolivar	2	2	$59,335	0.7
Port Isabel	1	1	$882	0
Sabine Pass	1	1	$4,720	0
St. Petersburg	1	1	$25,199	6.5
Tampa	4	2	$140,578	3

Table 6.10 Community Impacts Under Alternative D (Assumption 1)

City	Impacted Vessels	Impacted Dealers	Loss of Shrimp Revenue	of Shrimp Revenue
Abbeville	19	8	$1,649,586	6.9
Aransas Pass	10	2	$173,335	2.4
Bayou La Batre	14	5	$979,506	5.3
Belle Chase	5	1	$51,631	1.9
Biloxi	15	6	$989,859	4.6
Bon Secour	8	3	$249,709	3.9
Boothville	1	1	$9,275	0.1
Brownsville	20	3	$1,769,490	6.7
Cameron	8	2	$126,330	5.3
Cut Off	4	3	$139,048	2.9
Dauphin Island	1	1	$383	0.2
Delcambre	2	2	$94,894	3.7
Dulac	14	4	$594,935	4
Empire	1	1	$9,748	0.1
Freeport	16	1	$390,203	4.6
Ft. Myers Beach	8	2	$475,797	4.5
Fulton	1	1	$45,592	3.8
Galveston	16	1	$1,058,011	15.9
Golden Meadow	1	1	$529	0
Grand Chenier	5	1	$51,449	6.7
Gulf Shores	1	1	$3,749	1.9
Houma	2	1	$22,257	0.6
Key West	12	2	$334,248	4.4
Lafitte	3	3	$34,505	0.5
Lake Charles	4	1	$223,337	6.8

New Orleans	1	1	$8,687	0.5
Palacios	23	6	$1,439,568	4.9
Pensacola	2	1	$113,125	16.2
Port Arthur	34	5	$2,480,930	10.1
Port Bolivar	20	4	$1,116,931	12.3
Port Isabel	2	3	$78,317	0.5
Sabine Pass	18	4	$564,049	10.7
Seabrook	1	1	$65,644	4.4
St. Petersburg	13	1	$247,505	64.3
Tampa	3	1	$153,664	3.3
Tarpon Springs	3	3	$164,154	6.9
Venice	2	1	$2,904	0
Westwego	1	1	$951	5.1

City	Number of Impacted Vessels	Number of Impacted Dealers	Loss of Shrimp Revenue	Percentage Loss of Shrimp Revenue
Abbeville	5	6	$759,502	3.2
Biloxi	2	3	$224,337	1
Bon Secour	1	1	$1,205	0
Boothville	2	1	$23,156	0.3
Brownsville	1	1	$89,563	0.3
Cameron	3	2	$67,220	2.8
Crystal Beach	1	1	$48,061	8.9
Cut Off	1	1	$103,202	2.2
Delcambre	2	3	$11,464	0.4
Dulac	2	2	$92,923	0.6
Empire	1	1	$56,684	0.5
Franklin	1	1	$250	0.3
Freeport	1	1	$68,563	0.8
Fulton	1	1	$8,047	0.7
Galveston	2	1	$32,605	0.5
Golden Meadow	2	1	$82,802	0.7
Grand Chenier	2	1	$90,300	11.8
Key West	2	2	$124,065	1.6
Lockport	2	1	$69,826	1.6
Marrero	1	1	$15,848	88
Ocean Springs	1	1	$60,082	20.8
Palacios	5	3	$250,933	0.9
Pascagoula	1	1	$13,095	1
Patterson	1	1	$22,518	84.1

Port Bolivar	1	2	$59,935	0.7
Port Isabel	1	1	$882	0
Sabine Pass	1	1	$4,720	0
St. Petersburg	1	1	$90,131	23.4
Tampa	1	1	$61,834	1.3
Tarpon Springs	1	1	$56,361	2.4
Venice	2	2	$60,904	0.8

City	Number of Impacted Vessels	Number of Impacted Dealers	Loss of Shrimp Revenue	Percentage Loss of Shrimp Revenue
Abbeville	5	5	$746,327	3.1
Bayou La Batre	1	1	$68,848	0.4
Biloxi	2	2	$162,708	0.7
Bon Secour	1	1	$1,205	0
Boothville	2	1	$23,156	0.3
Brownsville	1	1	$89,563	0.3
Cameron	3	2	$67,220	2.8
Crystal Beach	1	1	$48,061	8.9
Cut Off	1	1	$103,202	2.2
Delcambre	2	3	$11,464	0.4
Dulac	2	2	$92,923	0.6
Empire	1	1	$56,684	0.5
Franklin	1	1	$250	0.3
Freeport	1	1	$68,563	0.8
Fulton	1	1	$8,047	0.7
Galveston	2	1	$20,967	0.3
Golden Meadow	2	1	$82,802	0.7
Grand Chenier	2	1	$90,300	11.8
Key West	2	2	$43,871	0.6
Lockport	2	1	$69,826	1.6
Marrero	1	1	$15,848	88
Ocean Springs	1	1	$60,082	20.8
Palacios	5	3	$250,933	0.9
Pascagoula	1	1	$13,095	1

Port Arthur	3	4	$428,643	1.7
Port Bolivar	1	2	$59,935	0.7
Port Isabel	1	1	$882	0
Sabine Pass	1	1	$4,720	0
St. Petersburg	1	1	$25,199	6.5
Tampa	1	1	$61,834	1.3
Tarpon Springs	1	1	$56,361	2.4
Venice	2	2	$60,904	0.8

City	Number of Impacted Vessels	Number of Impacted Dealers	Loss of Shrimp Revenue	Percentage Loss of Shrimp Revenue
Abbeville	18	8	$2,710,794	11.3
Apalachicola	1	1	$61,673	4.9
Aransas Pass	10	2	$173,335	2.7
Bayou La Batre	15	6	$1,211,806	7.4
Belle Chase	4	1	$58,500	2.2
Biloxi	11	6	$1,157,456	5.5
Bon Secour	5	3	$519,517	8.4
Boothville	7	1	$297,539	4.3
Brownsville	20	3	$1,881,991	9.3
Cameron	7	1	$110,170	8.3
Carrabelle	1	1	$435	0.1
Chauvin	1	1	$19,417	1.7
Coden	1	1	$2,466	0.3
Cut Off	3	2	$147,146	3.6
Dauphin Island	1	1	$383	1.3
Delcambre	2	2	$46,003	1.8
Dulac	12	5	$612,245	4.5
Empire	8	2	$244,571	3.1
Freeport	16	1	$390,203	4.7
Ft. Myers Beach	8	2	$547,506	6.1
Fulton	1	1	$22,796	3.8
Galveston	16	1	$1,095,639	17.1
Gautier	1	1	$1,075	9.5
Golden Meadow	8	1	$117,268	1.7

Grand Isle	5	2	$86,315	0.9
Key West	22	2	$648,842	8.1
Lafitte	2	3	$160,801	3.8
Lake Charles	5	1	$314,038	9.6
Lockport	7	1	$777,014	18.4
Morgan City	2	1	$22,927	2.7
New Iberia	2	1	$25,657	11.9
New Orleans	1	1	$11,731	1.5
Palacios	23	6	$1,439,568	6.1
Pascagoula	1	2	$21,322	2.3
Pensacola	2	1	$145,869	43.4
Port Arthur	33	5	$2,233,433	9.1
Port Bolivar	18	4	$1,136,233	12.6
Port Isabel	2	3	$126,385	1.8
Sabine Pass	18	4	$564,049	10.7
Seabrook	1	1	$65,644	5.9
Tampa	3	1	$153,664	4.2
Tarpon Springs	3	3	$194,509	8.1
Venice	8	4	$268,481	3.4

ROCK SHRIMP

Action 1: Consideration of adding rock shrimp to the management unit of the Shrimp FMP

Alternative 1.A: Add rock shrimp to the management unit of the Shrimp FMP

Alternative 1.B: Status Quo - do not add rock shrimp to the management unit of the Shrimp FMP

Action 2: Consideration of requiring a rock shrimp vessel permit or an endorsement to the commercial shrimp vessel permit for vessels harvesting rock shrimp in the Gulf EEZ

Alternative 2.A: Require a separate commercial rock shrimp vessel permit to harvest rock shrimp from the Gulf EEZ if 50% to 90% or more of a vessels shrimp catch is rock shrimp

Alternative 2.B: Require a rock shrimp endorsement to the commercial shrimp vessel permit to harvest rock shrimp from the Gulf EEZ if 50% to 90% or more of a vessels shrimp catch is rock shrimp

Alternative 2.C: Status Quo - No Action - do not require vessels harvesting rock shrimp to have a separate commercial rock shrimp vessel permit or a rock shrimp endorsement to the commercial shrimp vessel permit to harvest rock shrimp from the Gulf EEZ if 50% to 90% or more of a vessels shrimp catch is rock shrimp

Action 3: MSY Alternatives

Alternative 3.A: MSY for rock shrimp from the Gulf of Mexico is the annual harvest level, estimated at between 112,000 and 4.4 million pounds of tails (1990-2000 catch range)

Alternative 3.B: MSY for rock shrimp from the Gulf of Mexico is estimated at 4.4 million pounds annually (the maximum annual catch recorded during the 1990 to 2000 period)

Alternative 3.C: MSY for rock shrimp from the Gulf of Mexico is defined as the yield that results from F_{MSY}

Action 4: OY Alternatives

Alternative 4.B: OY for rock shrimp from the Gulf of Mexico is equal to 80% to 95% of MSY

Action 5: Overfishing Definition

Alternative 5.A: The overfishing threshold for rock shrimp from the Gulf of Mexico is defined as a fishing mortality rate (F) that results in an annual catch exceeding MSY

Alternative 5.B: The overfishing threshold for rock shrimp from the Gulf of Mexico is defined as a fishing mortality rate (F) that results in catch exceeding MSY for 2 or 3 consecutive years

Alternative 5.C: The overfishing threshold for rock shrimp from the Gulf of Mexico is defined as a fishing mortality rate (F) the exceeds F_{MSY}

Action 6: Overfished Definition

Alternative 6.A: The rock shrimp stock in the Gulf of Mexico would be considered as overfished when its catch in any year is between 50% and 80% of MSY

Alternative 6.B: The rock shrimp stock in the Gulf of Mexico would be considered as overfished when its catch is between 50% and 80% of MSY for 2 or 3 consecutive years

Alternative 6.C: The rock shrimp stock in the Gulf of Mexico would be considered as overfished when its catch in any year is between 100% and 200% of MSY

Alternative 6.D: The rock shrimp stock in the Gulf of Mexico would be considered as overfished when its catch is between 100% and 200% of MSY for 2 or 3 consecutive years

Alternative 6.E: The rock shrimp stock in the Gulf of Mexico would be considered as overfished when its spawning stock (SS) is less than 50% of SS_{MSY}

Action 7: Consideration of removing royal red shrimp from the management unit of the Shrimp FMP

Alternative 7.A: Remove royal red shrimp from management unit of the Shrimp FMP, but retain royal red shrimp in the Shrimp FMP for data gathering purposes
Alternative 7.B: Status Quo - do not remove royal red shrimp from the management unit of the Shrimp FMP

Alternative 13.B: MSY for brown, white, and pink shrimp in the Gulf of Mexico is the yield associated with a SPR or SSBR within a range of 5% to 30%.

Alternative 13.B was addressed by CSAP (1998), and they did not feel that SPR or SSBR levels were appropriate to estimate MSY for shrimp because they are an annual crop, and no stock recruitment relationship based on immigration of shrimp larvae into estuaries has ever been demonstrated (GMFMC 1981). Annual production is largely dependent on survival of the post-larvae in the estuaries. Based on these considerations, this alternative was considered by the Council but rejected.

Alternative 14.B: OY for brown, white, and pink shrimp in the Gulf of Mexico is the yield associated with a SPR or SSBR within a range of 5% to 30%.

As with the Alternative 14.B is the same as Alternative 13.B, and as previously stated, "CSAP (1998) did not feel that SPR or SSBR levels were appropriate to estimate MSY for shrimp because they are an annual crop, and no stock recruitment relationship based on immigration of shrimp larvae into estuaries has ever been demonstrated (GMFMC 1981)."

Alternative 14.C: Based on the Shaefer surplus production model, set OY equal to or less than the range of 165 to 216 million pounds, annually for the three penaeid species.

Alternative 15.C: Based on the Shaefer surplus production model, set the overfishing threshold as a fishing mortality rate (F) that results in an annual harvest level for any of the penaeid shrimp stocks in excess of its estimated MSY range as follows:

Brown Shrimp - 100 - 132 million pounds
White Shrimp - 50 - 64 million pounds
Pink Shrimp - 15 - 20 million pounds

Alternative 16.B: Based on the Shaefer surplus production model, a penaeid shrimp stock would be considered as overfished when its catch in any year falls below 50% of the MSY range as follows:

Brown Shrimp - 50 - 66 million pounds
White Shrimp - 25 - 32 million pounds
Pink Shrimp - 7.5 - 10 million pounds

Alternative 15.G: Define overfishing as a fishing mortality rate (F) in excess of $5\%_{SPR}$ to $30\%_{SPR}$ or $5\%_{SSBR}$ to $30\%_{SSBR}$ for each of the penaeid shrimp stocks.

moratorium, vessels must have been issued a valid commercial shrimp vessel permit by NMFS prior to and including May 2, 2005.

<u>Alternative</u> <u>10.F</u>: In addition to vessels and entities that may qualify for a commercial shrimp vessel permit under the moratorium *as with Alternatives 10.B and 10.C*, a vessel would also qualify for a permit *under the moratorium* if that vessel can demonstrate that it has obtained a valid shrimp vessel permit by May 2, 2005, is a documented vessel or is at least 40 feet in length, *and had a valid permit to land shrimp in a state at some time between December 6, 2002 and March 9, 2005*.

APPENDIX B - GULF SHRIMP VESSEL & GEAR CHARACTERIZATION FORM

http://sero.nmfs.noaa.gov/

GULF SHRIMP VESSEL & GEAR CHARACTERIZATION FORM

INSTRUCTIONS

(Incomplete or illegible forms will be returned.)

*Please Note: It is required that the following survey be returned with your **FEDERAL PERMIT APPLICATION FOR VESSELS FISHING FOR SHRIMP IN THE GULF OF MEXICO EEZ** to the following address: NOAA Fisheries (F/SER22), 9721 EXECUTIVE CENTER DRIVE N., ST. PETERSBURG, FL 33702. If you have a question regarding the survey, please call 727/570 -5326 between 8 am - 4:30 pm EST.*

QUESTION 1 Enter the year that you purchased the vessel, regardless of whether it was new or used at the time.

QUESTION 2 For part a, indicate whether the vessel was **most frequently** operated by the owner or someone other than the owner (a hired captain) in 2004. For part b, indicate the number of crewmembers **typically** on board during 2004. Include the captain.

QUESTION 3 Answer 'yes' if the vessel was used to shrimp in the Federal waters of the Gulf of Mexico even **one** time during 2004.

QUESTION 4 Indicate the number of trips and the number of days at sea for this vessel in the Gulf shrimp fishery during 2004.

QUESTION 5 Indicate the number of days that this vessel participated in non-shrimp fishing activities in 2004.

QUESTION 6.1 Indicate the characteristics for the **one** gear type **most frequently** used on this vessel in 2004.

QUESTION 7 Indicate the **one** BRD type **most frequently** used on this vessel in 2004.

QUESTION 8 Indicate and provide additional details for the **one** TED type **most frequently** used on this vessel in **2004**. This will be the typical TED used **after** the 2003 regulatory changes.

QUESTION 9 Indicate **all** types of electronic equipment that were on-board this vessel in 2004.

KNOWINGLY SUPPLYING FALSE INFORMATION IS A VIOLATION OF FEDERAL LAW PUNISHABLE BY A FINE AND/OR IMPRISONMENT.

Public reporting burden for this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other suggestions for reducing this burden to Michael Travis, NOAA Fisheries, Economics Office, 9721 Executive Center Drive N., St. Petersburg, FL 33702, or mike.travis@noaa.gov.

All data submitted will be handled as confidential material in accordance with **NOAA Administrative Order 216-100, Protection of Confidential Fishery Statistics**. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subjected to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB

1. What year did you purchase this vessel?

2. a. In 2004, this vessel was **most frequently** operated by (check the appropriate box):
the owner a hired-captain

In 2004, what was the **typical** number of crew on the vessel, including captain?

b.

3. In 2004, did you shrimp in Federal waters (i.e. the EEZ[32]) of the Gulf of Mexico (check the appropriate box)?

Yes No

4. In 2004, what was the number of days at sea and trips for this vessel in the Gulf shrimp fishery?

Days at sea Number of Trips

.In 2004, how many days at sea did this vessel operate in non-shrimp fisheries?

Days at sea

6. The shaded table below lists a set of codes for net type and mesh type for typical shrimping gears used. Please use the codes in the table to complete the table in the next question.

Code	Gear Type	Code	Net Type	Code	Mesh Type
A	Otter Trawl	I	2 Seam Balloon	S	Nylon
B	Butterfly Net	J	4 Seam Balloon	T	Spectra
C	Cast Net	K	Box	U	Poly
D	Skimmer Net	L	Flat	V	Other (specify) _____
E	Wing Net	M	Western Jib		
F	Roller Frame	N	Add-on Bib	W	Other (specify) _____
G	Other (specify) _____	O	Built-in Bib (e.g. mongoose, cobra, etc.)		

[32] The EEZ portion of the fishery is from nine (9) miles outward off of the Texas and West Florida coasts, and from three (3) miles outward off the coasts of Louisiana, Mississippi, and Alabama.

		(specify)_____	
	Q	Other (specify)_____	
	R	Other (specify)_____	

6.1. Using the codes from the table above, please specify the gear type **most frequently** used as well as the net types, headrope length (ft), mesh types and size (inches) **most frequently** used in 2004.

Gear code	Net type code	Mesh type code	Headrope length (feet)	Mesh size (inches)
TRY NET			ft	in

ft in

7. In 2004, what type of BRD (bycatch reduction device) did you **most frequently** use? Check the appropriate box.

Jones-Davis Fisheye Gulf Fisheye Expanded Mesh

Extended Funnel

7.1 If a fisheye BRD was used, what was the distance from the bag tie rings to the BRD? _____inches

8. Please check the box by the type of TED you **most frequently** used in 2004.

8. Choose only one: a, b, or c.
9. Determine grid style using the diagrams of each provided on the following pages (choose one letter, A through H).
10. Fill in the details of the grid dimensions, opening type/size, flap size, and whether an accelerator was used.

a. Single Grid Hard TEDs

Grid Style	grid size (width x height)	opening size	Opening direction* (see below)	Accelerator Used	Flap Length beyond posterior edge of grid*** (see below)
				G Yes G No Size** ____	

1= 32”x32” minimum outside dimensions

1 = Double Cover (inshore & offshore)

*Opening direction:

** Funnel Size:

***Flap length:

		3 = 44 " (inshore only)	B = Bottom-opening	B = 71" (inshore & offshore)	2 = Less than 24" (specify)
		4= Other (specify)			3 = No Flap Used

b. Parker Soft TEDs

1.Opening type* (see below)	1.Flap Used? (Offshore only)
	G Yes G No
*Opening type: 1 = 56" cut (inshore only) 2 = 96" cut (offshore / inshore)	

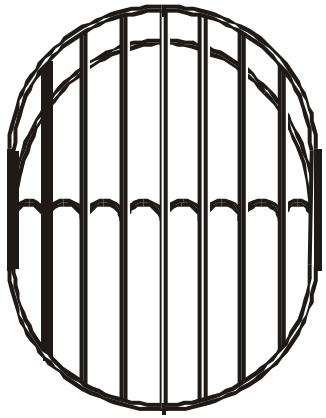
c. Hooped Hard TEDs

Grid style[1]	Frame Size	opening size	Opening direction* (see below)	Accelerator Used	Flap Length beyond posterior edge of grid*** (see below)
				G Yes G No Size** ____	
1= NMFS	1 = Inshore minimum	1 = Double Cover (inshore & offshore)	*Opening direction:	** Funnel Size:	***Flap length:
2= Coulon	2 = Offshore minimum	2=- 71-in (inshore & offshore)	A = Top-opening	A = 44" (inshore only)	1= 24" maximum
	3 = Other (specify)	3 = 44-in (inshore only)	B = Bottom-opening	B = 71" (inshore & offshore)	2 = Less than 24" (Specify)
					3 = No Flap

Figure 1. Common Turtle ExcluderDevices

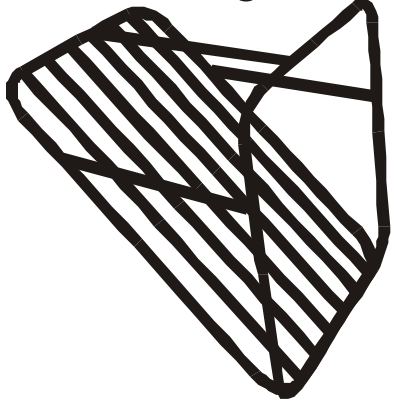
D

Georgia



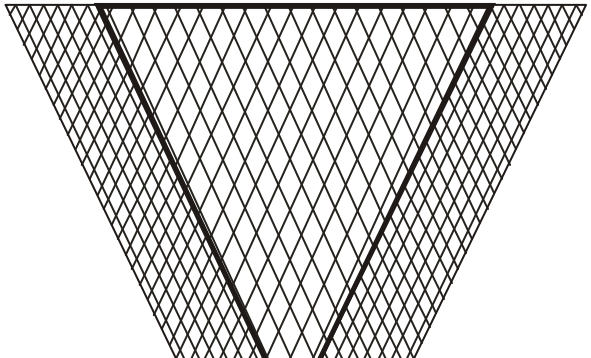
E

Fixed Angle



F

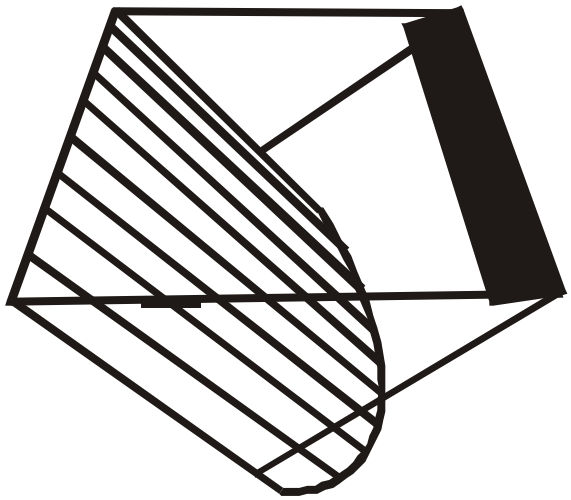
Parker Soft TED



Hooped Hard TEDs

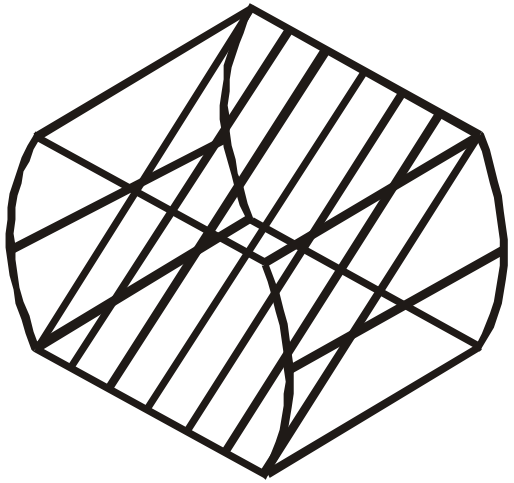
G

Coulon



H

NMFS



equipment that may not be presently used in the Gulf shrimp fishery, but are used in other fisheries for which this type of information is being collected.

Item	Please Check [
Cell phone	
VHF radio	
CB Radio	
Single sideband radio	
Satellite phone	
Fax	
Plotter	
Computer (including software)	
Printer	
Hailer (Boat intercom)	
Loran	
Vessel Tracking System	
Radar	
Global Positioning System (GPS)	
Auto Pilot	
EPIRB	
Echo Sounder/Depth Recorder (please check which you have): G paper G video G digital	
Electronic Compass	
Satellite Navigation System (SatNav)	
Radio Direction Finder	
Weather Satellite Receiver	
Wind Meter	
Net Pingers	
Temperature Profiling System	
Water Temperature Sensor	
Single direction sonar	
Multiple direction sonar	
Water salinity Sensor	
Other (please specify)_____	

Abbeville Demographics

Factor	1990	2000
Total population	11,187	11,887
Gender Ratio M/F (Number)	5,218/5,959	5,486/6,401
Age (Percent of total population)		
Under 18 years of age	31.2	29.7
18 to 64 years of age	53.1	54.6
65 years and over	15.7	15.7
Ethnicity or Race (Number)		
White	6,607	6,454
Black or African American	4,146	4,584
American Indian and Alaskan Native	16	23
Asian	381	654
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	37	46
Two or more races	N/A	126
Hispanic or Latino (any race)	138	229
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	27.6	20.1
Percent high school graduate or higher	50.6	55.7
Percent with a Bachelor's degree or higher	10.4	8.9
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	30.6	24.3
And Percent who speak English less than very well	9.8	10.6
Household income (Median $)	12,653	19,714
Poverty Status (Percent of population with income below poverty line)	38.9	37.7
Percent female headed household	21.5	21.5
Home Ownership (Number)		
Owner occupied	2,481	2,753
Renter occupied	1,657	1,746
Value Owner-occupied Housing (Median $)	39,600	58,800
Monthly Contract Rent (Median $)	169	314
Employment Status (Population 16 yrs and over)		
Percent in the labor force	51.5	50.9
Percent of civilian labor force unemployed	15.5	10.8
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	20.8
Service occupations	N/A	21.2
Sales and office occupations	N/A	25.1
Farming, fishing, and forestry occupations	3.1	2.4
Construction, extraction, and maintenance occupations	N/A	9.7
Production, transportation, and material moving occupations	N/A	20.8
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	2.6	4.0
Mining (includes the offshore oil/gas industry workforce)	8.0	7.8
Manufacturing	11.5	10.0
Percent government workers	14.8	12.8

Gender Ratio M/F (Number)	1,213/1,389	1,107/1,227
Age (Percent of total population)		
Under 18 years of age	26.6%	21.9%
18 to 64 years of age	55.4%	57.7%
65 years and over	18.0%	20.5%
Ethnicity or Race (Number)		
White	1,604	1,480
Black or African American	973	815
American Indian and Alaskan Native	10	4
Asian	12	9
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	3	11
Two or more races	N/A	15
Hispanic or Latino (any race)	25	39
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	21.9%	9.1%
Percent high school graduate or higher	52.9%	69.2%
Percent with a Bachelor's degree or higher	12.0%	15.3%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	2.3%	2.6%
And Percent who speak English less than very well	1.1%	1.0%
Household income (Median $)	$12,813	$23,073
Poverty Status (Percent of population with income below poverty line)	34.6%	25.3%
Percent female headed household	16.3%	15.0%
Home Ownership (Number)		
Owner occupied	717	694
Renter occupied	317	312
Value Owner-occupied Housing (Median $)	$43,000	$83,800
Monthly Contract Rent (Median $)	$170	$393
Employment Status (Population 16 yrs and over)		
Percent in the labor force	48.7%	50.5%
Percent of civilian labor force unemployed	3.8%	3.6%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	25.4%
Service occupations	N/A	27.5%
Sales and office occupations	N/A	21.2%
Farming, fishing, and forestry occupations	4.6%	5.9%
Construction, extraction, and maintenance occupations	N/A	5.6%
Production, transportation, and material moving occupations	N/A	14.4%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	5.4%	3.9%
Mining (includes the offshore oil/gas industry workforce)	0.0%	0.0%
Manufacturing	4.9%	2.9%
Percent government workers	22.5%	20.3%

Aransas Pass Demographics

Factor	**1990**	**2000**
Total population	7,180	8,138

Gender Ratio M/F (Number)	3,486/3,694	4,018/4,120
Age (Percent of total population)		
Under 18 years of age	30.6%	28.3%
18 to 64 years of age	54.8%	57.2%
65 years and over	14.6%	14.5%
Ethnicity or Race (Number)		
White	5,903	6,558
Black or African American	349	280
American Indian and Alaskan Native	31	62
Asian	38	37
Native Hawaiian and other Pacific Islander	N/A	1
Some other race	859	918
Two or more races	N/A	282
Hispanic or Latino (any race)	2,541	3,068
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	21.3%	11.6%
Percent high school graduate or higher	53.2%	67.1%
Percent with a Bachelor's degree or higher	8.7%	8.2%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	26.9%	28.7%
And Percent who speak English less than very well	11.1%	8.8%
Household income (Median $)	$15,024	$27,376
Poverty Status (Percent of population with income below poverty line)	34.5%	18.3%
Percent female headed household	13.4%	13.4%
Home Ownership (Number)		
Owner occupied	1,489	1,874
Renter occupied	1,015	1,087
Value Owner-occupied Housing (Median $)	$40,800	$53,700
Monthly Contract Rent (Median $)	$240	$475
Employment Status (Population 16 yrs and over)		
Percent in the labor force	59.9%	52.9%
Percent of civilian labor force unemployed	7.6%	4.7%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	20.4%
Service occupations	N/A	24.2%
Sales and office occupations	N/A	24.4%
Farming, fishing, and forestry occupations	5.9%	1.9%
Construction, extraction, and maintenance occupations	N/A	14.0%
Production, transportation, and material moving occupations	N/A	15.1%
Industry ** (Percent in workforce)		
Agriculture, forestry, fishing and hunting	5.4%	2.4%
Mining (includes the offshore oil/gas industry workforce)	1.9%	1.4%
Manufacturing	7.0%	6.4%
Percent government workers	12.1%	16.0%

Bayou La Batre Demographics

Factor	**1990**	**2000**

Total population	2,456	2,313
Gender Ratio M/F (Number)	1,201/1,255	1,159/1,154
Age (Percent of total population)		
Under 18 years of age	34.3%	29.9%
18 to 64 years of age	54.7%	59.0%
65 years and over	11.0%	11.2%
Ethnicity or Race (Number)		
White	1,605	1,213
Black or African American	250	237
American Indian and Alaskan Native	3	6
Asian	595	770
Native Hawaiian and other Pacific Islander	N/A	10
Some other race	3	22
Two or more races	N/A	55
Hispanic or Latino (any race)	67	44
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	30.0%	24.0%
Percent high school graduate or higher	45.2%	54.9%
Percent with a Bachelor's degree or higher	6.0%	7.4%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	26.3%	29.1%
And Percent who speak English less than very well	18.0%	15.8%
Household income (Median $)	$15,775	$24,539
Poverty Status (Percent of population with income below poverty line)	36.1%	28.2%
Percent female headed household	15.6%	17.6%
Home Ownership (Number)		
Owner occupied	537	501
Renter occupied	234	268
Value Owner-occupied Housing (Median $)	$35,200	$45,800
Monthly Contract Rent (Median $)	$164	$366
Employment Status (Population 16 yrs and over)		
Percent in the labor force	54.2%	53.7%
Percent of civilian labor force unemployed	9.7%	11.1%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	14.1%
Service occupations	N/A	18.3%
Sales and office occupations	N/A	20.7%
Farming, fishing, and forestry occupations	8.6%	5.2%
Construction, extraction, and maintenance occupations	N/A	10.8%
Production, transportation, and material moving occupations	N/A	30.9%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	11.1%	4.4%
Mining (includes the offshore oil/gas industry workforce)	1.3%	0.8%
Manufacturing	23.4%	21.9%
Percent government workers	9.0%	7.7%

Boothville Demographics

Factor	1990	2000
Total population	2,743	2,220
Gender Ratio M/F (Number)	1,403/1,340	1,133/1087
Age (Percent of total population)		
Under 18 years of age	36.1	31.7
18 to 64 years of age	57.6	60.8
65 years and over	6.3	7.5
Ethnicity or Race (Number)		
White	1,810	1,375
Black or African American	783	638
American Indian and Alaskan Native	80	75
Asian	62	89
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	8	6
Two or more races	N/A	37
Hispanic or Latino (any race)	50	27
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	27.9	27.3
Percent high school graduate or higher	43.5	48.4
Percent with a Bachelor's degree or higher	3.8	3.0
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	7.3	10.2
And Percent who speak English less than very well	1.7	3.8
Household income (Median $)	16,250	33,813
Poverty Status (Percent of population with income below poverty line)	36.9	17.3
Percent female headed household	11.1	14.2
Home Ownership (Number)		
Owner occupied	699	650
Renter occupied	145	96
Value Owner-occupied Housing (Median $)	47,900	73,600
Monthly Contract Rent (Median $)	223	276
Employment Status (Population 16 yrs and over)		
Percent in the labor force	55.3	53.0
Percent of civilian labor force unemployed	3.2	3.8
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	18.1
Service occupations	N/A	10.6
Sales and office occupations	N/A	19.5
Farming, fishing, and forestry occupations	12.0	11.0
Construction, extraction, and maintenance occupations	N/A	11.4
Production, transportation, and material moving occupations	N/A	29.4
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	14.5	12.6
Mining (includes the offshore oil/gas industry workforce)	8.0	10.1
Manufacturing	7.0	4.8
Percent government workers	11.3	16.1

Total population	98,962	139,722
Gender Ratio M/F (Number)	46,714/52,248	65,783/73,939
Age (Percent of total population)		
Under 18 years of age	36.5%	34.6%
18 to 64 years of age	54.8%	55.9%
65 years and over	8.7%	9.5%
Ethnicity or Race (Number)		
White	83,895	114,083
Black or African American	193	575
American Indian and Alaskan Native	140	580
Asian	301	752
Native Hawaiian and other Pacific Islander	N/A	46
Some other race	14,433	20,486
Two or more races	N/A	3,200
Hispanic or Latino (any race)	89,206	127,535
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	40.2%	31.8%
Percent high school graduate or higher	45.5%	51.7%
Percent with a Bachelor's degree or higher	12.2%	13.4%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	87.3%	87.2%
And Percent who speak English less than very well	47.2%	42.0%
Household income (Median $)	$15,890	$24,468
Poverty Status (Percent of population with income below poverty line)	43.8%	36.0%
Percent female headed household	20.2%	20.9%
Home Ownership (Number)		
Owner occupied	14,681	23,361
Renter occupied	11,641	14,813
Value Owner-occupied Housing (Median $)	$39,000	$53,000
Monthly Contract Rent (Median $)	$236	$405
Employment Status (Population 16 yrs and over)		
Percent in the labor force	55.9%	52.4%
Percent of civilian labor force unemployed	15.3%	13.0%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	27.6%
Service occupations	N/A	18.5%
Sales and office occupations	N/A	26.7%
Farming, fishing, and forestry occupations	2.3%	1.0%
Construction, extraction, and maintenance occupations	N/A	9.4%
Production, transportation, and material moving occupations	N/A	16.9%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	2.3%	1.3 %
Mining (includes the offshore oil/gas industry workforce)	0.0%	0.2%
Manufacturing	14.1%	12.2%
Percent government workers	21.6%	19.5%

Total population	2,041	1,965
Gender Ratio M/F (Number)	1,028/1,013	996/969
Age (Percent of total population)		
Under 18 years of age	32.2	27.5
18 to 64 years of age	59.8	63.4
65 years and over	7.9	9.1
Ethnicity or Race (Number)		
White	1,747	1,621
Black or African American	257	233
American Indian and Alaskan Native	5	11
Asian	11	6
Native Hawaiian and other Pacific Islander	N/A	1
Some other race	21	66
Two or more races	N/A	27
Hispanic or Latino (any race)	83	109
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	28.6	22.7
Percent high school graduate or higher	46.6	58.7
Percent with a Bachelor's degree or higher	5.4	5.0
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	17.4	14.8
And Percent who speak English less than very well	5.4	6.5
Household income (Median $)	20,786	30,370
Poverty Status (Percent of population with income below poverty line)	20.0	19.4
Percent female headed household	10.0	14.5
Home Ownership (Number)		
Owner occupied	545	552
Renter occupied	133	143
Value Owner-occupied Housing (Median $)	41,400	52,600
Monthly Contract Rent (Median $)	214	307
Employment Status (Population 16 yrs and over)		
Percent in the labor force	60.8	48.9
Percent of civilian labor force unemployed	5.8	6.1
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	15.0
Service occupations	N/A	17.7
Sales and office occupations	N/A	22.7
Farming, fishing, and forestry occupations	11.6	8.9
Construction, extraction, and maintenance occupations	N/A	7.1
Production, transportation, and material moving occupations	N/A	28.6
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	11.0	10.9
Mining (includes the offshore oil/gas industry workforce)	11.8	20.6
Manufacturing	8.7	6.1
Percent government workers	17.6	14.0

Chauvin Demographics

Factor	1990	2000

Age (Percent of total population)		
Under 18 years of age	31.2	28.0
18 to 64 years of age	59.6	60.0
65 years and over	9.2	12.0
Ethnicity or Race (Number)		
White	3,314	3,132
Black or African American	1	3
American Indian and Alaskan Native	47	64
Asian	6	9
Native Hawaiian and other Pacific Islander	N/A	1
Some other race	7	1
Two or more races	N/A	19
Hispanic or Latino (any race)	13	22
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	34.7	32.0
Percent high school graduate or higher	48.9	44.3
Percent with a Bachelor's degree or higher	5.5	3.5
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	40.3	33.9
And Percent who speak English less than very well	8.8	11.1
Household income (Median $)	18,168	25,922
Poverty Status (Percent of population with income below poverty line)	23.3	20.1
Percent female headed household	6.8	9.4
Home Ownership (Number)		
Owner occupied	942	936
Renter occupied	132	154
Value Owner-occupied Housing (Median $)	38,300	54,500
Monthly Contract Rent (Median $)	197	362
Employment Status (Population 16 yrs and over)		
Percent in the labor force	51.0	44.7
Percent of civilian labor force unemployed	3.8	4.3
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	16.6
Service occupations	N/A	20.9
Sales and office occupations	N/A	17.2
Farming, fishing, and forestry occupations	5.6	4.7
Construction, extraction, and maintenance occupations	N/A	11.3
Production, transportation, and material moving occupations	N/A	29.3
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	5.7	4.7
Mining (includes the offshore oil/gas industry workforce)	13.6	6.5
Manufacturing	9.3	15.3
Percent government workers	17.4	16.7

Coden Demographics

Factor	**1990**	**2000**
Total population	1,233	1,318

Under 18 years of age	31.5%	27.7%
18 to 64 years of age	57.0%	60.9%
65 years and over	11.5%	11.4%
Ethnicity or Race (Number)		
White	902	716
Black or African American	211	198
American Indian and Alaskan Native	2	2
Asian	116	354
Native Hawaiian and other Pacific Islander	N/A	6
Some other race	2	4
Two or more races	N/A	38
Hispanic or Latino (any race)	31	20
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	24.4%	20.4%
Percent high school graduate or higher	47.4%	54.6%
Percent with a Bachelor's degree or higher	4.8%	7.9%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	14.1%	25.0%
And Percent who speak English less than very well	7.9%	12.1%
Household income (Median $)	$17,250	$24,750
Poverty Status (Percent of population with income below poverty line)	26.1%	29.4%
Percent female headed household	8.2%	14.4%
Home Ownership (Number)		
Owner occupied	343	334
Renter occupied	69	90
Value Owner-occupied Housing (Median $)	$34,500	$42,400
Monthly Contract Rent (Median $)	$184	$323
Employment Status (Population 16 yrs and over)		
Percent in the labor force	55.0%	50.0%
Percent of civilian labor force unemployed	14.4%	12.0%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	14.2%
Service occupations	N/A	20.9%
Sales and office occupations	N/A	15.6%
Farming, fishing, and forestry occupations	13.0%	10.0%
Construction, extraction, and maintenance occupations	N/A	15.1%
Production, transportation, and material moving occupations	N/A	17.8%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	18.8%	12.8%
Mining (includes the offshore oil/gas industry workforce)	1.6%	3.1%
Manufacturing	23.2%	22.3%
Percent government workers	9.9%	12.5%

Delcambre Demographics

Factor	**1990**	**2000**

Age (Percent of total population)		
Under 18 years of age	30.0	27.7
18 to 64 years of age	55.9	59.7
65 years and over	14.1	12.6
Ethnicity or Race (Number)		
White	1,637	1,793
Black or African American	325	313
American Indian and Alaskan Native	14	19
Asian	0	11
Native Hawaiian and other Pacific Islander	N/A	1
Some other race	2	5
Two or more races	N/A	26
Hispanic or Latino (any race)	24	41
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	26.5	16.8
Percent high school graduate or higher	58.3	64.9
Percent with a Bachelor's degree or higher	7.9	10.1
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	41.9	26.1
And Percent who speak English less than very well	12.7	8.2
Household income (Median $)	17,875	27,500
Poverty Status (Percent of population with income below poverty line)	24.2	20.2
Percent female headed household	20.4	16.3
Home Ownership (Number)		
Owner occupied	496	574
Renter occupied	237	252
Value Owner-occupied Housing (Median $)	37,400	58,200
Monthly Contract Rent (Median $)	153	226
Employment Status (Population 16 yrs and over)		
Percent in the labor force	56.2	61.9
Percent of civilian labor force unemployed	4.4	7.4
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	22.2
Service occupations	N/A	13.2
Sales and office occupations	N/A	24.2
Farming, fishing, and forestry occupations	3.9	1.1
Construction, extraction, and maintenance occupations	N/A	13.1
Production, transportation, and material moving occupations	N/A	26.2
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	4.5	2.6
Mining (includes the offshore oil/gas industry workforce)	12.2	16.1
Manufacturing	15.5	9.8
Percent government workers	18.3	13.4

Dulac Demographics

Factor	**1990**	**2000**
Total population	3,273	2,458
Gender Ratio M/F (Number)	1,620/1,653	1,229/1,229

18 to 64 years of age	56.0	58.7
65 years and over	7.1	9.8
Ethnicity or Race (Number)		
White	1,603	1,327
Black or African American	77	61
American Indian and Alaskan Native	1,568	969
Asian	14	12
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	11	12
Two or more races	N/A	77
Hispanic or Latino (any race)	66	42
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	55.5	38.1
Percent high school graduate or higher	27.1	39.9
Percent with a Bachelor's degree or higher	1.9	3.9
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	50.0	37.4
And Percent who speak English less than very well	14.5	10.8
Household income (Median $)	12,653	22,900
Poverty Status (Percent of population with income below poverty line)	49.3	30.9
Percent female headed household	14.9	14.2
Home Ownership (Number)		
Owner occupied	729	609
Renter occupied	181	159
Value Owner-occupied Housing (Median $)	28,700	54,700
Monthly Contract Rent (Median $)	179	407
Employment Status (Population 16 yrs and over)		
Percent in the labor force	45.8	44.9
Percent of civilian labor force unemployed	8.0	6.7
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	12.4
Service occupations	N/A	12.7
Sales and office occupations	N/A	17.7
Farming, fishing, and forestry occupations	17.1	15.9
Construction, extraction, and maintenance occupations	N/A	12.0
Production, transportation, and material moving occupations	N/A	29.4
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	19.6	19.7
Mining (includes the offshore oil/gas industry workforce)	4.0	6.1
Manufacturing	14.0	10.0
Percent government workers	9.0	6.0

Empire Demographics

Factor	**1990**	**2000**
Total population	2,654	2,211
Gender Ratio M/F (Number)	1,332/1,322	1,111/1,100
Age (Percent of total population)		

65 years and over	8.0	10.7
Ethnicity or Race (Number)		
White	1,677	1,344
Black or African American	872	747
American Indian and Alaskan Native	13	9
Asian	92	61
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	0	20
Two or more races	N/A	30
Hispanic or Latino (any race)	28	26
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	26.7	23.9
Percent high school graduate or higher	48.2	60.3
Percent with a Bachelor's degree or higher	4.6	11.8
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	12.8	9.7
And Percent who speak English less than very well	4.1	4.1
Household income (Median $)	19,194	27,208
Poverty Status (Percent of population with income below poverty line)	30.3	27.9
Percent female headed household	18.3	16.1
Home Ownership (Number)		
Owner occupied	694	666
Renter occupied	166	105
Value Owner-occupied Housing (Median $)	41,100	56,500
Monthly Contract Rent (Median $)	211	359
Employment Status (Population 16 yrs and over)		
Percent in the labor force	60.0	54.6
Percent of civilian labor force unemployed	10.3	11.5
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	23.7
Service occupations	N/A	14.5
Sales and office occupations	N/A	15.8
Farming, fishing, and forestry occupations	14.0	16.3
Construction, extraction, and maintenance occupations	N/A	11.3
Production, transportation, and material moving occupations	N/A	18.4
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	18.5	18.8
Mining (includes the offshore oil/gas industry workforce)	6.3	8.4
Manufacturing	12.0	4.7
Percent government workers	18.6	23.2

Freeport Demographics

Factor	**1990**	**2000**
Total population	11,389	12,708
Gender Ratio M/F (Number)	5,692/5,697	6,353/6,355
Age (Percent of total population)		
Under 18 years of age	34.2%	35.7%

Ethnicity or Race (Number)		
White	7,086	7,822
Black or African American	1,739	1,700
American Indian and Alaskan Native	41	71
Asian	32	45
Native Hawaiian and other Pacific Islander	N/A	1
Some other race	2,491	2,657
Two or more races	N/A	412
Hispanic or Latino (any race)	4,395	6,614
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	21.3%	22.6%
Percent high school graduate or higher	58.1%	55.1%
Percent with a Bachelor's degree or higher	6.4%	5.4%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	31.9%	45.3%
And Percent who speak English less than very well	13.7%	23.5%
Household income (Median $)	$21,483	$30,245
Poverty Status (Percent of population with income below poverty line)	24.1%	22.3%
Percent female headed household	13.4%	16.8%
Home Ownership (Number)		
Owner occupied	2,163	2,373
Renter occupied	1,627	1,790
Value Owner-occupied Housing (Median $)	$35,800	$5,700
Monthly Contract Rent (Median $)	$259	$439
Employment Status (Population 16 yrs and over)		
Percent in the labor force	63.6%	54.3%
Percent of civilian labor force unemployed	9.5%	7.5%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	16.4%
Service occupations	N/A	16.8%
Sales and office occupations	N/A	24.0%
Farming, fishing, and forestry occupations	2.3%	0.1%
Construction, extraction, and maintenance occupations	N/A	20.5%
Production, transportation, and material moving occupations	N/A	22.2%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	2.3%	0.1%
Mining (includes the offshore oil/gas industry workforce)	1.5%	0.3%
Manufacturing	24.9%	17.7%
Percent government workers	10.1%	10.5%

Golden Meadow Demographics

Factor	**1990**	**2000**
Total population	2,049	2,193
Gender Ratio M/F (Number)	970/1,079	1,069/1,124
Age (Percent of total population)		

65 years and over	15.2	15.5
Ethnicity or Race (Number)		
White	1,939	2,029
Black or African American	0	11
American Indian and Alaskan Native	92	106
Asian	9	9
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	9	17
Two or more races	N/A	21
Hispanic or Latino (any race)	87	32
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	41.8	27.0
Percent high school graduate or higher	44.2	54.3
Percent with a Bachelor's degree or higher	6.2	8.1
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	54.5	40.0
And Percent who speak English less than very well	17.2	10.3
Household income (Median $)	16,373	28,690
Poverty Status (Percent of population with income below poverty line)	22.7	18.8
Percent female headed household	11.9	9.9
Home Ownership (Number)		
Owner occupied	573	637
Renter occupied	204	184
Value Owner-occupied Housing (Median $)	37,400	57,600
Monthly Contract Rent (Median $)	173	243
Employment Status (Population 16 yrs and over)		
Percent in the labor force	46.6	50.1
Percent of civilian labor force unemployed	3.1	4.4
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	20.2
Service occupations	N/A	13.0
Sales and office occupations	N/A	18.2
Farming, fishing, and forestry occupations	3.2	7.5
Construction, extraction, and maintenance occupations	N/A	11.6
Production, transportation, and material moving occupations	N/A	29.5
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting (and mining)	4.1	6.0
Mining (includes the offshore oil/gas industry workforce)	11.4	12.0
Manufacturing	4.5	8.0
Percent government workers	10.9	12.8

Galveston Demographics

Factor	**1990**	**2000**
Total population	59,070	57,247
Gender Ratio M/F (Number)	28,539/30,531	27,649/29,598
Age (Percent of total population)		
Under 18 years of age	24.7%	23.4%

Ethnicity or Race (Number)		
White	36,315	33,582
Black or African American	17,161	14,592
American Indian and Alaskan Native	144	243
Asian	1,387	1,839
Native Hawaiian and other Pacific Islander	N/A	42
Some other race	4,063	5,571
Two or more races	N/A	1,378
Hispanic or Latino (any race)	12,649	14,753
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	13.7%	10.3%
Percent high school graduate or higher	70.0%	74.4%
Percent with a Bachelor's degree or higher	21.1%	23.7%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	19.8%	26.5%
And Percent who speak English less than very well	7.6%	11.2%
Household income (Median $)	$20,825	$28,895
Poverty Status (Percent of population with income below poverty line)	24.2%	22.3%
Percent female headed household	16.3%	16.9%
Home Ownership (Number)		
Owner occupied	10,136	10,399
Renter occupied	14,021	13,443
Value Owner-occupied Housing (Median $)	$57,200	$73,800
Monthly Contract Rent (Median $)	$309	$531
Employment Status (Population 16 yrs and over)		
Percent in the labor force	62.7%	59.7%
Percent of civilian labor force unemployed	9.0%	10.1%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	35.2%
Service occupations	N/A	24.2%
Sales and office occupations	N/A	24.0%
Farming, fishing, and forestry occupations	1.8%	0.3%
Construction, extraction, and maintenance occupations	N/A	8.3%
Production, transportation, and material moving occupations	N/A	8.0%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	1.5%	0.3%
Mining (includes the offshore oil/gas industry workforce)	1.0%	0.5%
Manufacturing	5.7%	4.1%
Percent government workers	32.1%	31.5%

Grand Isle Demographics

Factor	**1990**	**2000**
Total population	1,455	1,541
Gender Ratio M/F (Number)	738/717	788/753
Age (Percent of total population)		

65 years and over	7.8	13.2
Ethnicity or Race (Number)		
White	1,447	1,480
Black or African American	2	3
American Indian and Alaskan Native	6	35
Asian	0	3
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	0	6
Two or more races	N/A	14
Hispanic or Latino (any race)	11	23
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	23.9	17.0
Percent high school graduate or higher	57.0	68.3
Percent with a Bachelor's degree or higher	5.6	13.3
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	28.2	18.4
And Percent who speak English less than very well	10.9	3.2
Household income (Median $)	19,454	33,548
Poverty Status (Percent of population with income below poverty line)	25.8	13.2
Percent female headed household	9.7	8.4
Home Ownership (Number)		
Owner occupied	391	498
Renter occupied	137	124
Value Owner-occupied Housing (Median $)	42,100	69,500
Monthly Contract Rent (Median $)	249	316
Employment Status (Population 16 yrs and over)		
Percent in the labor force	55.1	57.8
Percent of civilian labor force unemployed	3.9	4.7
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	22.0
Service occupations	N/A	16.9
Sales and office occupations	N/A	22.5
Farming, fishing, and forestry occupations	5.4	8.8
Construction, extraction, and maintenance occupations	N/A	13.9
Production, transportation, and material moving occupations	N/A	15.9
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	5.4	8.3
Mining (includes the offshore oil/gas industry workforce)	8.5	6.9
Manufacturing	17.6	8.9
Percent government workers	13.8	14.2

Houma Demographics

Factor	**1990**	**2000**
Total population	30,495	32,393
Gender Ratio M/F (Number)	14,521/ 15,974	15,768/ 16,625
Age (Percent of total population)		

65 years and over	11.8	12.2
Ethnicity or Race (Number)		
White	21,651	21,851
Black or African American	7,613	8,461
American Indian and Alaskan Native	925	1,116
Asian	235	230
Native Hawaiian and other Pacific Islander	N/A	6
Some other race	71	221
Two or more races	N/A	508
Hispanic or Latino (any race)	430	571
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	19.0	13.1
Percent high school graduate or higher	62.6	69.5
Percent with a Bachelor's degree or higher	12.6	14.3
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	13.9	10.6
And Percent who speak English less than very well	4.2	2.8
Household income (Median $)	19,397	34,471
Poverty Status (Percent of population with income below poverty line)	26.4	20.8
Percent female headed household	16.7	16.7
Home Ownership (Number)		
Owner occupied	6,876	7,871
Renter occupied	3,782	3,763
Value Owner-occupied Housing (Median $)	53,700	82,000
Monthly Contract Rent (Median $)	218	417
Employment Status (Population 16 yrs and over)		
Percent in the labor force	54.1	56.2
Percent of civilian labor force unemployed	4.5	7.1
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	26.0
Service occupations	N/A	15.3
Sales and office occupations	N/A	28.9
Farming, fishing, and forestry occupations	1.1	0.6
Construction, extraction, and maintenance occupations	N/A	13.9
Production, transportation, and material moving occupations	N/A	15.3
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	1.4	0.5
Mining (includes the offshore oil/gas industry workforce)	11.6	9.0
Manufacturing	6.0	7.8
Percent government workers	14.3	13.8

Lafitte Demographics

Factor	**1990**	**2000**
Total population	1,507	1,576
Gender Ratio M/F (Number)	768/739	810/766
Age (Percent of total population)		
Under 18 years of age	30.7	24.2
18 to 64 years of age	61.0	64.8

White	1,452	1,490
Black or African American	9	18
American Indian and Alaskan Native	28	36
Asian	16	8
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	2	1
Two or more races	N/A	23
Hispanic or Latino (any race)	26	28
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	28.6	29.3
Percent high school graduate or higher	50.6	57.6
Percent with a Bachelor's degree or higher	7.7	6.7
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	5.6	7.6
And Percent who speak English less than very well	2.6	2.1
Household income (Median $)	16,985	33,872
Poverty Status (Percent of population with income below poverty line)	26.9	15.9
Percent female headed household	17.4	7.9
Home Ownership (Number)		
Owner occupied	433	474
Renter occupied	80	82
Value Owner-occupied Housing (Median $)	47,300	103,900
Monthly Contract Rent (Median $)	237	283
Employment Status (Population 16 yrs and over)		
Percent in the labor force	56.5	53.9
Percent of civilian labor force unemployed	9.1	5.1
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	19.3
Service occupations	N/A	9.4
Sales and office occupations	N/A	28.3
Farming, fishing, and forestry occupations	10.2	14.2
Construction, extraction, and maintenance occupations	N/A	13.2
Production, transportation, and material moving occupations	N/A	15.5
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	10.2	14.2
Mining (includes the offshore oil/gas industry workforce)	8.2	10.9
Manufacturing	14.2	11.3
Percent government workers	15.3	7.7

Montegut Demographics

Factor	**1990**	**2000**
Total population	1,784	1,803
Gender Ratio M/F (Number)	885/899	907/896
Age (Percent of total population)		
Under 18 years of age	33.4	31.6
18 to 64 years of age	58.1	59.5
65 years and over	8.6	8.9

Black or African American	6	19
American Indian and Alaskan Native	120	153
Asian	0	0
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	2	20
Two or more races	N/A	46
Hispanic or Latino (any race)	22	26
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	33.9	27.0
Percent high school graduate or higher	46.2	58.2
Percent with a Bachelor's degree or higher	7.3	3.7
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	30.7	22.5
And Percent who speak English less than very well	9.5	5.0
Household income (Median $)	17,204	32,107
Poverty Status (Percent of population with income below poverty line)	24.4	22.9
Percent female headed household	5.7	12.0
Home Ownership (Number)		
Owner occupied	490	501
Renter occupied	90	91
Value Owner-occupied Housing (Median $)	42,700	55,700
Monthly Contract Rent (Median $)	238	323
Employment Status (Population 16 yrs and over)		
Percent in the labor force	45.2	53.2
Percent of civilian labor force unemployed	2.2	4.8
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	17.2
Service occupations	N/A	6.2
Sales and office occupations	N/A	30.8
Farming, fishing, and forestry occupations	6.1	5.2
Construction, extraction, and maintenance occupations	N/A	10.9
Production, transportation, and material moving occupations	N/A	29.8
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	4.3	5.2
Mining (includes the offshore oil/gas industry workforce)	16.2	14.5
Manufacturing	6.8	12.9
Percent government workers	21.0	12.4

Palacios Demographics

Factor	**1990**	**2000**
Total population	3,904	4,207
Gender Ratio M/F (Number)	1,948/1956	2,111/2,096
Age (Percent of total population)		
Under 18 years of age	35.1%	34.8%
18 to 64 years of age	51.9%	60.7%
65 years and over	13.0%	4.5%
Ethnicity or Race (Number)		

Asian	257	289
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	683	1,064
Two or more races	N/A	132
Hispanic or Latino (any race)	1,836	2,342
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	23.0%	26.3%
Percent high school graduate or higher	40.9%	55.9%
Percent with a Bachelor's degree or higher	11.8%	12.5%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	43.6%	43.5%
And Percent who speak English less than very well	14.5%	19.1%
Household income (Median $)	$25,833	$28,350
Poverty Status (Percent of population with income below poverty line)	32.9%	23.2%
Percent female headed household	14.8%	13.9%
Home Ownership (Number)		
Owner occupied	848	948
Renter occupied	403	438
Value Owner-occupied Housing (Median $)	$40,700	$43,750
Monthly Contract Rent (Median $)	$231	$289
Employment Status (Population 16 yrs and over)		
Percent in the labor force	58.7%	51.2%
Percent of civilian labor force unemployed	13.0%	9.5%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	22.6%
Service occupations	N/A	11.5%
Sales and office occupations	N/A	24.3%
Farming, fishing, and forestry occupations	9.0%	9.1%
Construction, extraction, and maintenance occupations	N/A	8.5%
Production, transportation, and material moving occupations	N/A	16.6%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	10.2%	12.2%
Mining (includes the offshore oil/gas industry workforce)	0.0%	0.4%
Manufacturing	10.4%	12.6%
Percent government workers	20.1%	19.8%

Port Arthur Demographics

Factor	**1990**	**2000**
Total population	58,724	57,755
Gender Ratio M/F (Number)	27,697/31,027	27,525/30,230
Age (Percent of total population)		
Under 18 years of age	28.2%	28.7%
18 to 64 years of age	54.8%	55.8%
65 years and over	17.0%	15.5%
Ethnicity or Race (Number)		

Asian	2,825	3,404
Native Hawaiian and other Pacific Islander	N/A	9
Some other race	2,019	5,127
Two or more races	N/A	1,187
Hispanic or Latino (any race)	4,829	10,081
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	16.6%	14.4%
Percent high school graduate or higher	65.5%	69.7%
Percent with a Bachelor's degree or higher	10.0%	9.3%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	15.6%	23.2%
And Percent who speak English less than very well	7.2%	12.7%
Household income (Median $)	$18,548	$26,455
Poverty Status (Percent of population with income below poverty line)	28.1%	25.2%
Percent female headed household	17.2%	19.7%
Home Ownership (Number)		
Owner occupied	14,515	13,578
Renter occupied	7,811	8,261
Value Owner-occupied Housing (Median $)	$30,400	$35,900
Monthly Contract Rent (Median $)	$226	$405
Employment Status (Population 16 yrs and over)		
Percent in the labor force	54.3%	52.8%
Percent of civilian labor force unemployed	6.9%	7.0%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	20.8%
Service occupations	N/A	23.2%
Sales and office occupations	N/A	23.8%
Farming, fishing, and forestry occupations	2.0%	1.1%
Construction, extraction, and maintenance occupations	N/A	12.2%
Production, transportation, and material moving occupations	N/A	18.8%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	2.1%	1.3%
Mining (includes the offshore oil/gas industry workforce)	0.7%	1.6%
Manufacturing	17.6%	13.1%
Percent government workers	13.4%	17.0%

Port Isabel Demographics

Factor	**1990**	**2000**
Total population	4,467	4,865
Gender Ratio M/F (Number)	2,136/2,331	2,358/2,507
Age (Percent of total population)		
Under 18 years of age	33.2%	30.4%
18 to 64 years of age	56.5%	57.4%
65 years and over	10.3%	12.2%

American Indian and Alaskan Native	6	16
Asian	10	12
Native Hawaiian and other Pacific Islander	N/A	5
Some other race	488	756
Two or more races	N/A	150
Hispanic or Latino (any race)	3,337	3,619
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	29.8%	24.3%
Percent high school graduate or higher	49.1%	59.1%
Percent with a Bachelor's degree or higher	7.3%	12.3%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	73.7%	71.3%
And Percent who speak English less than very well	39.2%	28.9%
Household income (Median $)	$15,275	$25,323
Poverty Status (Percent of population with income below poverty line)	39.0%	27.3%
Percent female headed household	14.6%	16.6%
Home Ownership (Number)		
Owner occupied	808	984
Renter occupied	555	665
Value Owner-occupied Housing (Median $)	$48,300	$58,900
Monthly Contract Rent (Median $)	$229	$405
Employment Status (Population 16 yrs and over)		
Percent in the labor force	62.9%	57.2%
Percent of civilian labor force unemployed	5.5%	4.4%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	17.7%
Service occupations	N/A	29.6%
Sales and office occupations	N/A	27.6%
Farming, fishing, and forestry occupations	4.7%	3.8%
Construction, extraction, and maintenance occupations	N/A	9.8%
Production, transportation, and material moving occupations	N/A	11.5%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	4.7%	6.1%
Mining (includes the offshore oil/gas industry workforce)	0.0%	0.0%
Manufacturing	3.6%	3.5%
Percent government workers	16.1%	13.5%

Port Lavaca Demographics

Factor	**1990**	**2000**
Total population	10,886	12,035
Gender Ratio M/F (Number)	5,301/5,585	5,992/6,043
Age (Percent of total population)		
Under 18 years of age	30.8%	30.3%
18 to 64 years of age	59.0%	57.6%
65 years and over	10.2%	12.1%

American Indian and Alaskan Native	19	56
Asian	330	476
Native Hawaiian and other Pacific Islander	N/A	10
Some other race	2,266	2,036
Two or more races	N/A	310
Hispanic or Latino (any race)	5,076	6,272
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	19.3%	15.1%
Percent high school graduate or higher	64.5%	68.1%
Percent with a Bachelor's degree or higher	10.8%	12.7%
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	38.8%	58.8%
And Percent who speak English less than very well	16.6%	11.4%
Household income (Median $)	$21,946	$33,626
Poverty Status (Percent of population with income below poverty line)	20.4%	20.1%
Percent female headed household	11.6%	13.7%
Home Ownership (Number)		
Owner occupied	2,386	2,743
Renter occupied	1,397	1,446
Value Owner-occupied Housing (Median $)	$45,500	$56,600
Monthly Contract Rent (Median $)	$255	$430
Employment Status (Population 16 yrs and over)		
Percent in the labor force	61.2%	58.8%
Percent of civilian labor force unemployed	10.0%	8.2%
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	26.3%
Service occupations	N/A	15.9%
Sales and office occupations	N/A	17.2%
Farming, fishing, and forestry occupations	3.1%	1.9%
Construction, extraction, and maintenance occupations	N/A	16.7%
Production, transportation, and material moving occupations	N/A	22.0%
Industry (Percent in workforce)**		
Agriculture, forestry, fishing and hunting	3.6%	2.4%
Mining (includes the offshore oil/gas industry workforce)	0.8%	0.9%
Manufacturing	21.1%	25.4%
Percent government workers	13.0%	16.0%

Venice Demographics

Factor	**1990**	**2000**
Total population	1,073	699
Gender Ratio M/F (Number)	545/528	377/322
Age (Percent of total population)		
Under 18 years of age	35.8	31.9
18 to 64 years of age	56.2	60.1
65 years and over	8.0	8.0
Ethnicity or Race (Number)		

American Indian and Alaskan Native	59	27
Asian	13	25
Native Hawaiian and other Pacific Islander	N/A	0
Some other race	0	3
Two or more races	N/A	7
Hispanic or Latino (any race)	23	7
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	32.2	37.2
Percent high school graduate or higher	41.4	39.9
Percent with a Bachelor's degree or higher	2.8	3.6
Language Spoken at Home (Population 5 years and over)		
Percent who speak a language other than English at home	6.7	9.4
And Percent who speak English less than very well	0.6	2.5
Household income (Median $)	17,717	33,750
Poverty Status (Percent of population with income below poverty line)	40.9	19.3
Percent female headed household	0	10.5
Home Ownership (Number)		
Owner occupied	283	223
Renter occupied	49	23
Value Owner-occupied Housing (Median $)	49,200	35,600
Monthly Contract Rent (Median $)	219	275
Employment Status (Population 16 yrs and over)		
Percent in the labor force	45.3	48.1
Percent of civilian labor force unemployed	5.6	6.6
Occupation (Percent in workforce)**		
Management, professional, and related occupations	N/A	7.1
Service occupations	N/A	15.7
Sales and office occupations	N/A	26.7
Farming, fishing, and forestry occupations	12.5	12.4
Construction, extraction, and maintenance occupations	N/A	18.1
Production, transportation, and material moving occupations	N/A	19.6
Industry (Percent in workforce)		
Agriculture, forestry, fishing and hunting	17.5	8.6
Mining (includes the offshore oil/gas industry workforce)	4.3	6.2
Manufacturing	5.2	9.0
Percent government workers	7.2	14.3