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A FRAMEWORK MEASURE TO ADDRESS THE BYCATCH REDUCTION CRITERION FOR SHRIMP TRAWLS IN THE GULF OF MEXICO WEST OF CAPE SAN BLAS, FLORIDA UNDER THE FISHERY MANAGEMENT PLAN FOR THE SHRIMP FISHERY OF THE GULF OF MEXICO INCLUDING ENVIRONMENTAL ASSESSMENT, REGULATORY IMPACT REVIEW, AND REGULATORY FLEXIBILITY ACT ANALYSIS

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EXECUTIVE SUMMARY

Existing performance standards for the certification of bycatch reduction devices (BRD) in the Gulf of Mexico Exclusive Economic Zone (EEZ) West of Cape San Blas, Florida require a minimum reduction of 44% in juvenile (ages 0 and 1) red snapper mortality from the average during the 1984 through 1989 timeframe. This criterion is focused on red snapper and based on an outdated model that is no longer applicable to the established red snapper rebuilding plan. In addition, recent studies conducted aboard commercial shrimp vessels indicate that the Fisheye BRD, the most widely used device in the Gulf, achieves less than a 20% reduction in juvenile red snapper mortality.

This proposed framework measure under the fishery management plan for the shrimp fishery of the Gulf of Mexico considers alternative bycatch reduction certification criteria for BRDs used in shrimp trawls in the Gulf of Mexico EEZ West of Cape San Blas, Florida. **Alternative 1** would maintain the status quo and continue to rely on a 44% reduction in juvenile red snapper mortality to evaluate BRD performance. **Alternative 2** would base BRD certification on the device's recorded percentage reduction in catch per unit effort (CPUE) on ages 0 and 1 red snapper. Minimum performance thresholds under this alternative include a 12%, 20%, and 30% reduction in CPUE on juvenile red snapper. **Alternative 3** would use percentage reductions in total finfish bycatch (by weight) to evaluate the performance of BRDs considered for certification. Total finfish reduction levels considered under this alternative increase in 10 percentage- point increments from 10% to 40%.

For future BRD certification, the preferred alternative selected by the Gulf Council would require a minimum reduction in total finfish (by weight) of 30%. The selected bycatch reduction criterion sets a realistic bycatch reduction threshold and addresses shrimp trawl bycatch more comprehensively because it does not focus on red snapper. The preferred certification performance standard is expected to increase flexibility, promote innovation, and allow for the certification of a wider variety of BRDs. A wider variety of BRDs available to the fishery would allow fishermen to choose the most effective device for specific local fishing conditions, and enhance overall finfish reduction. In addition, the criterion selected would eliminate discrepancies between the eastern and western Gulf performance standards.

FISHERY IMPACT STATEMENT

This framework measure under the fishery management plan for the shrimp fishery in the Gulf of Mexico aims to further reduce red snapper bycatch by establishing flexible and consistent performance standards for the certification of bycatch reduction devices (BRD) for the penaeid shrimp fishery in the Gulf of Mexico EEZ west of Cape San Blas, Florida.

The proposed action is administrative in nature. As such, it is not expected to have direct impacts on the human environment. It is, however, expected to result in overall positive indirect effects. Modifications to the existing BRD certification criterion are expected to result in more flexible, less volatile and easier to measure BRD performance standards.

This regulatory action is not expected to directly impact fishery participants. Changes to the existing BRD certification criterion are not expected to directly affect fishing. However, fishery participants may be indirectly affected by this action. Indirect costs stem from BRD replacement costs that may be incurred by shrimp vessel owners. Under Alternative 1, industry-wide replacement costs are estimated between $6,020,125 and $10,060,175 because only the Jones-Davis BRD, the most expensive device, has been shown to meet the existing criterion. Replacement costs limited to active qualifying vessels range from $4,622,300 to $7,718,000. Similar replacement costs are expected from Option c under Alternative 2 and Option d under Alternative 3. Management options establishing performance standards that would allow the certification of the Fisheye BRD are not expected to result in replacement costs due to the already widespread use of this device. Management measures that are not expected to result in BRD replacement costs include Options a and b under Alternatives 2 and 3. Under Alternative 3, Option c, replacement costs are expected to range from a minimum of $2,833,000 to a maximum of $10,060,175. Replacement cost estimates limited to active qualifying vessels would vary from $2,175,200 to $7,718,000. Alternative 3, Option c would also eliminate discrepancies between the Eastern and Western Gulf certification criteria.

In terms of indirect benefits, alternatives seeking to modify current BRD performance standards are expected to result in a more stable and easier to measure certification criterion. This action is anticipated to promote academic and industry involvement in BRD research and development. An increased long-term interest could result in the design of more efficient and cost effective BRDs. Greater reductions in bycacth levels and increases in shrimp retention are among benefits expected from future BRD designs. In addition to its positive impacts on the health of red snapper and other stocks commonly caught in shrimp trawls, further reductions in bycatch from shrimp trawling would lessen the need for more stringent regulations such as effort restrictions. Possible future reductions in shrimp loss could improve profitability of shrimp vessel owners.

Expected indirect benefits presented above, though not quantifiable at this time, will more than outweigh potential BRD replacement costs. Therefore, overall positive indirect impacts are expected from this action.

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ABBREVIATIONS USED IN THIS DOCUMENT

APA	Administrative Procedures Act
AP	Advisory Panel
B	Spawning Stock Biomass
B_{MSY}	Biomass at MSY
BRD	Bycatch Reduction Device
CEQ	Council on Environmental Quality
CPUE	Catch Per Unit Effort
CZMA	Coastal Zone Management Act
DQA	Data Quality Act
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Rate of Instantaneous Fishing Mortality
FEIS	Final Environmental Impact Statement
F_{MSY}	Fishing Mortality Rate at MSY
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
GSMFC	Gulf States Marine Fisheries Commission
HAPC	Habitat Area of Particular Concern
IRFA	Initial Regulatory Flexibility Analysis
LOA	Letter of Authorization
m	Meters
MBTA	Migratory Bird Treaty Act
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MP	Million Pounds
M-SFCMA	Magnuson-Stevens 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
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
OMB	Office of Management and Budget
OY	Optimum Yield
ppm	Parts Per Million
ppt	Parts Per Thousand
PRA	Paperwork Reduction Act
RA	Regional Administrator

RFA	Regulatory Flexibility Act of 1980
RIR	Regulatory Impact Review
ROD	Record of Decision
SAFMC	South Atlantic Fisheries Management Council
SBA	Small Business Administration
SFA	Sustainable Fisheries Act
SEIS	Supplemental Environmental Impact Statement
SLF	Shrimp Landings File
SPR	Spawning Potential Ratio
TAC	Total Allowable Catch
TALFF	Total Allowable Level of Foreign Fishing
TED	Turtle Excluder Device
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VOUF	Vessel Operating Units File

Environmental Assessment (EA) Cover Sheet

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Name of Action

Regulatory Amendment to Address the Bycatch Reduction Criterion for Shrimp Trawls in the Gulf of Mexico West of Cape San Blas, Florida.

Type of Action

(X) Administrative
() Draft

( ) Legislative
(X) Final

Summary

This amendment proposes to modify the bycatch reduction certification criterion for bycatch reduction devices (BRDs) used in shrimp trawls in the EEZ of the Gulf of Mexico west of Cape San Blas, Florida, (85º30' West Longitude) and shoreward of the 100-fathom (183 m) contour. Exemptions to this requirement are stated in 50 CFR Part 622.41 (h) (1) (iii through v) and 622.41 (h) (3) (iii).

Filing Dates with EPA

A Notice of Intent to prepare an SEIS for this action and others was published in Federal Register on October 5, 2005 (70 FR 57859), and amended on January 10, 2006 (71 FR 1519).

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. Brown shrimp are caught out to at least 50 fathoms, though most catches are taken from less than 30 fathoms. The majority of juvenile red snapper bycatch occur in the brown shrimp fishery. White shrimp are the second most abundant species with catches approaching the brown shrimp level in 2004 (Nance 2005). Typically, white shrimp are caught inshore of 15 fathoms, and the bycatch of juvenile red snapper is minimal. Pink shrimp landings were relatively stable in the last few years at around 7.0 MP. Pink shrimp are usually taken from waters less than 25 fathoms with the majority of catch being harvested in 11 to 15 fathoms off the west coast of Florida. Consequently, the least amount of red snapper are taken in this fishery. Annual production of royal red shrimp is variable at approximately 225,000 pounds in recent years. Royal red shrimp are a deep-water shrimp occurring primarily in depths of 140 to 300 fathoms, and no red snapper are encountered in this fishery.

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. By evaluating stock biomass (B) and fishing mortality rate (F) in relation to MSY and OY, 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 current level of biomass ($B_{CURRENT}$) and rate of fishing mortality ($F_{CURRENT}$) in a fishery in relation to B_{MSY} and F_{MSY} to determine if a stock is overfished or undergoing overfishing, respectively. A fishery experiencing a fishing mortality rate that exceeds the F_{MSY} would be considered undergoing overfishing. A stock with a biomass below one half of the B_{MSY} would be considered as overfished.

These parameters (MSY, OY, MSST, MFMT) are difficult to apply to the penaeid shrimp stocks because they are short-lived (essentially annual crops) and because the year-class strength of these 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.

Definitions of MSY and OY were recently approved by the Council are as follows: 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

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 due to the fact that these are annual stocks whose abundance in a given year is dictated primarily by environmental conditions, the Council approved of setting OY equal to MSY.

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.

A**mendment 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 certification 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.

Amendment 13/EA, recently submitted for implementation, would establish an endorsement to the existing federal shrimp vessel permit for vessels harvesting royal red shrimp; define the overfishing threshold and the overfished condition for royal red; define MSY and OY for penaeid shrimp stocks; establish bycatch reporting methodologies and improve collection of shrimping effort data in the EEZ; require completion of a Gulf Shrimp Vessel and Gear Characterization Form; establish a moratorium on the issuance of commercial shrimp vessel permits with a qualifying date of December 6, 2003; and require reporting and certification of landings during the moratorium.

2.0 PURPOSE AND NEED FOR ACTION

The purpose of this regulatory amendment is to consider alternatives to change the bycatch reduction certification criterion for red snapper from penaeid shrimp trawling in the EEZ. The current criterion establishes a target that is no longer appropriate, applicable, or accurate for the shrimp fishery. The current criterion is focused on red snapper and based on an outdated model that is no longer applicable to the established red snapper rebuilding plan. Revising the bycatch reduction device (BRD) certification criterion to address shrimp trawl bycatch more comprehensively and realistically is expected to increase flexibility, promote innovation, and allow for the certification of a wider variety of BRDs. Having a wider variety of BRDs available to the fishery would allow fishermen to choose the most effective BRD for the specific local fishing conditions, and enhance overall finfish reduction.

The current regulations require the installation of NMFS-certified BRDs that meet or exceed the bycatch reduction criterion established by the Council in each net used aboard vessels trawling for shrimp in specified areas of the Gulf of Mexico EEZ. Exempted are vessels trawling for royal red

shrimp beyond the 100-fathom contour and vessels trawling for groundfish or butterfish. A single try net with a headrope length of 16 feet or less per vessel and no more than two rigid-frame roller trawls limited to 16 feet or less, such as those used in the Big Bend area of Florida are also exempted. Although BRDs are required, current information suggests that the standard of performance has probably changed and currently certified BRDs may not be meeting the necessary requirements.

The current bycatch reduction certification criterion for BRDs in shrimp trawls of vessels fishing west of Cape San Blas, Florida, (85°30' W. Longitude) and inside of 100 fathoms is that they must reduce the bycatch mortality of juvenile red snapper (age 0 and age 1) by a minimum of 44% from the average level of mortality on those age groups during the years 1984-1989. This criterion was established by GMFMC (1997) and was based on a stock assessment (Goodyear 1995) that concluded that a 50% reduction in the cumulative instantaneous fishing mortality for age 0 and age 1 juveniles would be required to restore the red snapper stock within the GMFMC's then specified recovery period (2019) provided: (1) it was initiated in 1997, (2) recruitment does not decline, and (3) the directed harvest does not exceed 10 million pounds. The estimate of F was 2.06 (18% being age 0 [F=.370] and 82% being age 1 [F=1.693]; thus a 50% reduction in the cumulative fishing mortality rate for the base period would be F=1.03. The 44% reduction criterion resulted from a 10% reduction in shrimping effort that was determined to have occurred between the 1984-89 average period and 1995.

Because of a number of changes that have occurred in the shrimp and red snapper fisheries since the development of GMFMC (1997), there is a need to revisit the aforementioned bycatch reduction certification criterion. Some of these changes to the directed red snapper fishery include: new stock assessments, increased minimum size limits, reduced bag limits, reduced total allowable catch (TAC), changes to the commercial fishing seasons, and a modified rebuilding period (GMFMC 2004a). Changes to the shrimp fishery include: the requirement of BRDs east of Cape San Blas, Florida, the requirement of vessel permits, a pending moratorium on the issuance of new shrimp vessel permits, and economic hardships due to low prices for shrimp and high fuel costs that will likely reduce participation in the EEZ and probably reduce effort in the future. Most recently, the devastating effects of Hurricanes Katrina and Rita in 2005 will likely have major impacts on fishing for both red snapper and shrimp in east Texas, Louisiana, Mississippi, and Alabama for several years.

Another reason to potentially revise the bycatch reduction certification criterion stems from the difficulty in being able to certify new BRDs due to the fact that the current criterion is based on reduction in fishing mortality that is difficult to measure, statistically. Consequently, only 2 BRD types have been certified since 1998 when the requirement went into effect; the Fisheye and the Jones-Davis BRD with over 90% of vessels using the Fisheye. Although studies of the Fisheye BRD prior to the development of GMFMC (1997) showed that it was capable of meeting and exceeding the minimum 44% reduction criterion, recent studies under real-time conditions aboard commercial shrimp vessels show that the Fisheye is probably achieving less than a 20% reduction. New BRD designs need to be available for use by shrimpers in order to reduced bycatch of red snapper and achieve recovery goals, and to reduce shrimp loss and make shrimping more efficient under current economic conditions. A change in the bycatch reduction criterion west of Cape San Blas, Florida, from a reduction in fishing mortality to a reduction in finfish catch would increase the opportunity to certify a greater variety of BRDs for use in the fishery and provide greater consistency with the rest of the Gulf and the South Atlantic. BRDs may have different capabilities under different fishing conditions, and having a wider variety of BRDs for use in the fishery would allow fishermen to choose the most effective BRD for the

specific local fishing conditions. This would enhance compliance with National Standard 9 of the M-SFCMA, and in the western Gulf of Mexico, potentially accelerate the rebuilding efforts for the overfished red snapper resource in the Gulf of Mexico.

3.0. MANAGEMENT ALTERNATIVES

Action 1: Alternatives to Modify the Bycatch Reduction Criterion for Bycatch Reduction Devices used in the Penaeid Shrimp Fishery west of Cape San Blas, Florida

Alternative 1: No Action - maintain the existing bycatch reduction criterion of a minimum of 44% from the average level of mortality on age 0 and age 1 red snapper during the years 1984-1989.

Alternative 2: Change the bycatch reduction criterion for red snapper to an expected percent reduction in catch per unit effort (CPUE) on age 0 and age 1 red snapper of:

Option a. 12%
Option b. 20%
Option c. 30%

Proposed Alternative 3: Change the bycatch reduction criterion to a reduction in the bycatch of total finfish by:

Option a. 10% by weight
Option b. 20% by weight
Proposed Option c. 30% by weight
Option d. 40% by weight

Note: The percentage reduction in weight under this alternative will then be translated into a percentage reduction in red snapper.

Discussion: To better address National Standard 9 of the M-SFCMA and support the Council's efforts to reduce bycatch throughout the Gulf of Mexico to the extent practicable, the Council is considering alternatives that provide a more generic and direct approach to bycatch reduction in the Gulf of Mexico shrimp fishery through the requirement of BRDs. National Standard 9 requires: "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" (16 U.S.C. § 1851[9]). Section 303 of the M-SFCMA expands on this requirement somewhat, stating that fishery management plans are required to "establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided" (16 U.S.C. § 1853[11]). The requirement of BRDs is only one means of reducing bycatch in the shrimp fishery, and consideration of the appropriate criterion for certification of these devices is the only action considered in this regulatory amendment. Other means of reducing

bycatch, e.g. reductions in effort, are under consideration in a future amendment that will consider the need for further bycatch reduction and its practicability.

Amendments 9 and 10 established two criteria for BRDs used in the Gulf of Mexico. Amendment 9 established a requirement, with limited exceptions, for the use of certified BRDs in shrimp trawls towed in the Gulf of Mexico EEZ shoreward of the 100 fm (183 m) depth contour and west of 85E30' W. longitude (western Gulf), the approximate longitude of Cape San Blas, Florida. To be certified for use in the western Gulf, BRDs must reduce bycatch mortality of juvenile red snapper by a minimum of 44% from the average level of mortality on these age 0 and age 1 groups during the years 1984 through 1989. Amendment 10 required BRDs in shrimp trawls fished in the EEZ east of 85E30' W. longitude (eastern Gulf). To be certified for use in the EEZ of the eastern Gulf, a BRD must reduce the weight of the finfish bycatch by at least 30%. This new criterion was established because juvenile red snapper are not common in the eastern Gulf.

The western Gulf requirement was based on the findings of Goodyear (1995) (a stock assessment for red snapper). This assessment recommended a 50% reduction in fishing mortality on age 0 and age 1 red snapper from the average mortalities during the 1984 to 1989 period. The estimated F for this time period was 2.06, based on the 1995 assessment techniques. Recognizing that a 10% reduction in effort had occurred in the shrimp fishery since 1989, the GMFMC established a target of 44% reduction from BRDs, which achieved the goal of reducing F to approximately 1.03. The reductions were calculated on the basis of beginning in 1997 in order to meet the then rebuilding goal of 20% Spawning Potential Ratio (SPR) by 2019.

This approach was valid based on the modeling techniques used for red snapper at that time (Goodyear 1995); however recent stock assessments have used different models, and the rebuilding target for red snapper has changed (GMFMC 2004a). For example, with changes to the red snapper stock, and to the red snapper and shrimp fisheries, and using refined assessment techniques, the 2005 assessment estimated F on age 0 and age 1 red snapper at 0.74 for the 1984-1989 time period. This difference does not mean that the 1995 assessment overestimated F, only that the scaling in the 2005 assessment changed. The F for juvenile red snapper attributable to the shrimp fishery still needs substantial reduction to achieve the new rebuilding target of 2032; however, the existing BRD reduction certification criterion of a 44% reduction in F to a level of 1.03 is simply no longer appropriate.

Although the Goodyear (1995) model could still be used with a change in scaling in order to develop a revised BRD reduction certification criterion based on a reduction in F, there are still problems with using an F target as the criterion. The F values for juvenile age 0 and age 1 red snapper vary from season to season based on the level of red snapper recruitment and shrimping effort. These variables are in turn linked to the performance of a given BRD to determine if the target F is being achieved. Because of this linkage, it is difficult to evaluate new BRD designs with regard to them meeting an F criterion. In practice, a BRD should be evaluated for its reduction in catch/CPUE of red snapper, and that catch/CPUE reduction should then be translated to a fishing mortality based on overall fleet fishing effort. Thus, the overall goal of reducing F in the shrimp fishery could be achieved from a high reduction of red snapper by BRDs, or by a lesser reduction of red snapper catch by BRDs in combination with an overall reduction in fishing effort.

In summary, the goal of reducing F to some specific level or to a fraction of a past benchmark F value

does not specifically address the efficacy of the BRD itself because of the fluctuations in shrimping effort. A more appropriate measure of the efficacy of a BRD to reduce bycatch is to evaluate the reductions in catch or CPUE of a species or species group on a real time basis. Doing so isolates the contribution by the BRD, and removes the interaction of total shrimping effort. The catch rate of a net with a BRD can be directly compared to the catch of a net without a BRD, to give reduction levels at any given time. Fishing mortality reductions can then be calculated based on the documented total effort by the fleet for any given time frame. This cannot be accomplished by attempting to apply F values for a specific year against a previous benchmark value because if the CPUE value is constant but the effort value fluctuates, then F attributable to the shrimp fishery fluctuates.

Another problem with meeting the mandate of reducing bycatch relates to the existing certification criterion in the western Gulf and the BRDs certified under this criterion. The Fisheye BRD was one of two BRD designs originally certified under the existing criterion for use in the western Gulf. Because of its simplistic design and low cost, it became the industry standard. Recent observer monitoring data indicate the Fisheye BRD does not now meet the western Gulf certification criterion (Table 1). There may be several reasons for this change. The potential of the BRD has not changed, but it appears fishing behavior, or some other factor, in the fleet has changed. Actions to maximize shrimp retention, without concurrent maintenance of fish reductions, may have resulted in a reduction in the effectiveness of the BRD to reduce bycatch. There have been numerous technological changes to the overall construction of shrimp trawl gear, such as new turtle excluder devices and longer nets. In addition, there have been changes in fishing practices to help increase shrimp retention, such as faster towing speeds and modified retrieval procedures, which may reduce the efficiency of the BRD. Although the exact reasons for this change in efficiency are not known, in practice, the Fisheye BRD does not appear to be meeting the current reduction criterion.

Some experimental BRDs tested in the past were not effective, but several potentially effective BRD designs simply could not meet the very specific F-based certification criterion established for the western Gulf. However, these experimental BRD designs have been demonstrated to achieve substantial levels of overall finfish reduction, and a moderate and consistent level of red snapper reduction (Table 1). These BRDs are also in a similar category in terms of overall shrimp retentions as the Fisheye BRD. In addition, based on recent testing on commercial vessels, these experimental BRDs exceed the actual bycatch reduction being achieved by the Fisheye BRD. By changing the F-based certification criteria for the western Gulf, these BRDs can be certified, and a greater level of bycatch reduction can be realized for both red snapper and total finfish.

For these reasons, it is prudent that the Council re-evaluates the bycatch reduction certification criterion for the shrimp fishery in the western Gulf and modify it as appropriate. Alternatives 2 or 3 would provide a similar basis from which to evaluate new and previously studied BRD designs. Additionally, depending on the option chosen, Alternative 3 could be consistent with the established BRD criterion in the eastern Gulf and the south Atlantic. The need for additional bycatch reduction, beyond the capabilities of these BRDs, and methods to achieve it, if needed, can then be evaluated, primarily on the basis of trends in effort.

Biological Impacts: The administrative act of changing, or not changing, the BRD criterion has no direct biological impacts. There are, however, indirect impacts associated with future actions based on the Council's choice for maintaining the existing criterion or changing to a new criterion. These

indirect biological impacts are summarized as follows. A somewhat more detailed discussion of these indirect impacts is found in Section 5.2 herein.

Alternative 1 would continue the F-based certification criterion of a 44% reduction in fishing mortality on age 0 and age 1 red snapper from the 1984 through 1989 time period. As discussed above this criterion is outdated and fluctuates depending on red snapper abundance and shrimping effort. From a biological standpoint, it is difficult to determine if BRD designs meet this criterion because a statistically valid number of tests that capture red snapper must be conducted and then extrapolated to a reduction in F. Consequently, because no new BRDs have been certified using this criterion since its implementation in 1998, the choice of this alternative would probably only allow the use of the currently limited variety of BRDs available to the western Gulf shrimp fishery, namely the Fisheye and Jones-Davis BRDs. Also, since the Fisheye does not appear to be performing at this level under commercial use, it may not continue to be certifiable under current regulations.

Alternative 2 would change the certification criterion from a percentage reduction in F for juvenile red snapper age 0 and age 1 to a percentage reduction in CPUE. This more direct measurement of the performance of a given BRD design does not have to be extrapolated across the fishery and is not subject to changes in red snapper recruitment and shrimping effort. On the other hand, since it is based on red snapper reduction, testing and evaluation to determine if the criterion is being met at any of the option levels (12%, 20% or 30%) would have to occur in areas where red snapper occur. Additionally, as with evaluation under Alternative 1, a statistically valid number of comparative tests that catch red snapper would have to be taken in order to certify new BRDs or to evaluate existing designs. Finally, it is likely that Option a would result in many more BRDs being certified (good for the industry), but their performance may be less than what is achievable thus resulting in the Council potentially not meeting its goal to reduce red snapper bycatch to the extent that is technologically achievable.

Alternative 3, Option c would propose an option that is consistent with the BRD criteria used in the eastern Gulf, east of 85E30' W. longitude, and in the south Atlantic. Any of the options under this alternative would create the simplest testing procedure because the criterion would be based on a total percentage reduction in finfish by weight; thus red snapper would not have to be taken in a sample in order for that sample to be used. On the other hand, there is a need to correlate total finfish bycatch reduction with that of red snapper. Consequently, testing would likely be stratified over a wide range of habitats that would also include that of juvenile red snapper such that a comparison of overall finfish bycatch and red snapper bycatch could be completed. As noted above for Alternative 2, Alternative 3, Option a (10%) may be the most beneficial to the industry, but it may not be significantly rigorous to reduce bycatch to the extent that is technologically achievable through the use of BRDs. Option b (20%) may or may not be sufficiently stringent to meet the test of reducing bycatch to the extent that is technologically achievable, but bycatch reduction from BRDs may be relatively small when compared with bycatch reduction that has occurred through reductions in shrimping effort. Additionally, Option b would allow the immediate certification of four BRD types (Table 1). Option c has already been implemented and shown to meet a previous practicability test; however, based on current data, it would only allow an initial certification of two BRD types (Table 1). On the other hand, Option d (40%) may set a criterion that is too robust for this bycatch management tool to be used in a practical manner in that potentially few, if any BRD designs can meet this criterion.

Socioeconomic Impacts:

Due to its administrative nature, this action is not expected to result in any direct economic impact. However, management measures considered under this action would result in indirect costs and benefits.

Indirect costs stem from BRD replacement costs incurred by shrimp vessel owners. Under Alternative 1, industry-wide replacement costs are estimated between $6,020,125 and $10,060,175 because only the most expensive Jones-Davis BRD has been shown to meet the existing certification criterion. Replacement costs limited to active qualifying vessels range from $4,622,300 to $7,718,000. Similar replacement costs are expected from Option c under Alternative 2 and Option d under Alternative 3.

Management options establishing performance standards that would allow the certification of the Fisheye BRD are not expected to result in replacement costs due to the already widespread use of this device. Vessel owners are not expected to incur BRD replacement expenses if the continued use of the Fisheye BRD were permitted. Management measures that are not expected to result in BRD replacement costs include Options a and b under Alternatives 2 and 3. Under Alternative 3,Option c, replacement costs are expected to range from a minimum of $2,833,000 to a maximum of $10,060,175. Replacement cost estimates limited to active qualifying vessels only vary from $2,175,200 to $7,718,000.

On the benefit side, alternatives seeking to modify current BRD performance standards are expected to result in a more stable and easier to measure certification criterion. This action is anticipated to promote academic and industry involvement in BRD research and development. An increased long- term interest could result in the design of more efficient and cost effective BRDs. Greater reductions in bycatch levels and increases in shrimp retention are among benefits expected from future BRD designs. In addition to its positive impacts on the health of red snapper and other stocks commonly caught in shrimp trawls, further reductions in bycatch from shrimp trawling would lessen the need for more stringent regulations such as effort restrictions. Possible future reductions in shrimp loss could improve profitability of shrimp vessel owners. Expected benefits presented above, though not quantifiable at this time, will more than outweigh potential BRD replacement costs. Therefore, overall positive indirect impacts are expected from this action.

4.0. AFFECTED ENVIRONMENT

4.1 Physical Environment

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 2004b). 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.

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 12EC to 29EC 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.

Habitat Use by Managed Shrimp Species

The amended M-SFCMA of 1996 included new Essential Fish Habitat (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 National Environmental Policy Act (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 2004b). 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 1997b), and in Amendment 9 to the Shrimp FMP with SEIS (GMFMC 1997a). 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.

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).

East and West Flower Garden Banks, Pulley Ridge, McGrail and Stetson Banks HAPCs - Pristine coral area protected by preventing use of any gear that interacts with the bottom and anchoring on all or portions of these areas. The East and West Flower Garden Banks were subsequently designated as 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, the Council, and the National Park Service (185 square nautical miles).

4.2 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% 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.

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, 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.

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 preys is essentially the same as that required by shrimp.

4.3 Economic and Social Environment

Economic Environment

Section 6.4 contains a detailed description of the economic environment potentially affected by management measures considered in this regulatory amendment and is incorporated herein by reference.

Social Environment

As discussed in the regulatory impact review section of this document, recent hurricane seasons have fundamentally affected the shrimp fishery, its supporting infrastructure and communities. While social and economic assessments of the nature and magnitude of these impacts are ongoing, limited information is available on fishermen, fishing-dependent businesses, or communities that depend on the Gulf shrimp fishery.

However, based on data collected prior to the devastating 2005 hurricane season, it is possible to provide summary information on the geographic distribution of landings and revenues, qualifying vessels, dealers/wholesalers, and processors. Such information could be useful in gauging the fishery's importance to particular communities, and the importance of certain communities to the fishery. 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.

This section draws extensively from the extended social environment discussion included in Amendment 13 (GMFMC 2005). However, it should be noted that the information in Amendment 13 is largely based on 2002 fishery conditions. Some data on the shrimp fishery, as described in Tables 3 to 19 and discussed in subsequent sections of this regulatory amendment, have been updated through 2004 (Travis, personal communication, 2006) to reflect changes that took place in the fishery since 2002. However, all data have not been able to be updated. Further, as previously stated, the impacts of the 2005 hurricane season, in tandem with other economic forces, are not yet known. Thus, even if all the

information in Amendment 13 could be updated through 2004, it is unlikely that the resulting description would mirror the fishery as it exists today. Thus, these potential differences must be factored into any attempt to understand the fishery and potential effects of management measures.

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

The information presented in Table 14 regarding the distribution of food shrimp dealers, landings, and sales by community provides insights into the importance of the shrimp fishery to particular communities, and their importance to the fishery. The information in Table 14 pertains to all Gulf food shrimp landings, regardless of whether they came from federal or state waters. All but three of the communities with ten or more dealers are located in Louisiana. However, the top three communities in terms of Gulf food shrimp sales are all in Texas and include Port Arthur, Palacios, and Brownsville. Of the additional communities with at least $10 million in shrimp sales, four are located in Louisiana (Abbeville, Golden Meadow, Dulac, Grand Isle); two in Texas (Port Isabel, Port Bolivar); one in each of the remaining Gulf states (Bayou La Batre, Alabama, Biloxi, Mississippi, and Fort Myers Beach, Florida). Per dealer shrimp sales by community range from a minimum of $28,736 recorded in Houma, Louisiana to a maximum of $5,964,451 in Port Arthur, Texas.

Distribution of Supplying Gulf Shrimp Vessels by Community

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 15. Note that, in this case, all known Gulf shrimp vessels are taken into account. In Table 16, only Gulf shrimp vessels eligible to apply for a moratorium permit 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 (Grand Isle, Dulac, Golden Meadow, Chauvin, Lafitte, Venice, Empire, Belle Chasse, and Boothville) with only Port Arthur being the non-Louisiana community in that group. Conversely, when only looking at federally permitted vessels, three communities in Texas (Port Arthur, Palacios, and Brownsville) and four communities in Louisiana (Dulac, Abbeville, Grand Isle, and Golden Meadow) rank in the top ten, along with Key West, Florida, Bayou La Batre, Alabama and, Biloxi, Mississippi. 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, and Belle Chasse have much stronger relationships with vessels that operate in state as opposed to federal waters, while the opposite is true for Port Arthur, Palacios, and Brownsville.

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 32 communities listed in Table 17.

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. Rankings presented in Table 18 indicate that most of the top ten communities with strong ties to the shrimp fishery are located in Louisiana (Dulac, Chauvin, Grand Isle, Abbeville) and Texas (Port Arthur, Brownsville, Palacios, Port Isabel).

In addition, community involvement in fishing related activities was evaluated in recent research completed by Impact Assessment Inc. (2005 a,b,c,d), in collaboration with NMFS. In this evaluation, a wide set of attributes was used to characterize fishing communities throughout the Gulf of Mexico. Fishing communities are defined under National Standard 8 as communities which are "substantially dependent on or substantially engaged in" fishing or fishing related activities. Fishing–specific attributes considered in this recent research include commercial permits and licenses (federal and state), for-hire and other recreational permits, seafood landings and retail markets, processing facilities, recreational tournaments, commercial and recreational docking facilities, and other seafood/fishing related parameters. A summary index derived from the presence or absence of these fishing-specific attributes was used to provide a preliminary characterization of "fishing-oriented" communities in the Gulf States. Communities are categorized as "primarily-involved," "secondarily-involved" or, "tangentially-involved" based on their level of involvement in fishing-related activities. For each Gulf state, summary tables listing communities and their preliminary categorization are presented in the reports. As expected communities with strong ties to the shrimp industry are classified as "primarily involved" communities, e.g., Empire, Venice and Dulac in Louisiana, Bayou la Batre in Alabama, Ft. Myers Beach in Florida, Biloxi in Mississippi, and, Palacios, Port Aransas, Brownsville, and Port Arthur in Texas.

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).

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 24 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. Communities falling into each group are listed in Table 19. 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.

4.4 Administrative Environment

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 National Oceanic and Atmospheric Administration's (NOAA's) Office of Law Enforcement, the U.S. Coast Guard (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."

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 at 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/

4.5 Description of the Fishery

General Description

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. This material is incorporated by reference and is not repeated here in detail. Amendment 9 (GMFMC 1997a) with SEIS and Amendment 13 (GMFMC 2005) with EA updated this information along with that of Habitats, Distribution, and Incidental Capture of Sea Turtles. A Biological Opinion (NMFS 2002a) further updated the description of shrimp trawling interactions with endangered and threatened sea turtles, and an additional Biological Opinion (NMFS 2006) incorporated descriptions of interactions with the newly listed smalltooth sawfish.

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. GMFMC (1997a) described a number of additional species of primarily vertebrate finfish and invertebrates that are taken as bycatch. The current ratio of shrimp to bycatch in the overall penaeid shrimp fishery is approximately 1:4.

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 Shrimp Landings File (SLF); the other is the Vessel Operating Units File (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 holds 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 the 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.

5.0. ENVIRONMENTAL CONSEQUENCES

Environmental Effects of Actions 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 IV. 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."

ACTION 1: Alternatives to Modify the Bycatch Reduction Criterion for Bycatch Reduction Devices used in the Penaeid Shrimp Fishery west of Cape San Blas, Florida

Alternative 1: No Action - maintain the existing bycatch reduction criterion of a minimum of 44% from the average level of mortality on age 0 and age 1 red snapper during the years 1984-1989.

Alternative 2: Change the bycatch reduction criterion for red snapper to an expected percent reduction in CPUE on age 0 and age 1 red snapper of:

Option a. 12%
Option b. 20%
Option c. 30%

Alternative 3: Change the bycatch reduction criterion to a reduction in the bycatch of total finfish by:

Option a. 10% by weight
Option b. 20% by weight
Option c. 30% by weight
Option d. 40% by weight

Note: The percentage reduction in weight under this alternative will then be translated into a percentage reduction in red snapper.

5.1 Direct and Indirect Effects on the Physical Environment

There should be no direct or indirect effects on the physical environment from the proposed action to modify the bycatch reduction certification criterion in the Gulf of Mexico west of Cape San Blas, Florida (85E30' W. longitude). The action would not alter fishing methods or gear to the extent that additional impacts to the bottom or other components of the physical environment would occur.

5.2 Direct and Indirect Effects on the Biological/Ecological Environment

The administrative act of changing, or not changing, the BRD certification criterion has no direct biological impacts. There are, however, indirect impacts associated with future actions based on the Council's choice for maintaining the existing criterion or changing to a new criterion. These indirect impacts are discussed as follows.

Alternative 1 would continue the F-based certification criterion of a 44% reduction in fishing mortality on age 0 and age 1 red snapper from the 1984 through 1989 time period. As discussed in Section IV this criterion is outdated and fluctuates depending on red snapper abundance and shrimping effort. From a biological standpoint, it is difficult to determine if BRD designs meet this criterion; consequently, the choice of this alternative would probably only allow the use of the currently limited variety of BRDs available to the western Gulf shrimp fishery, namely the Fisheye and Jones-Davis BRDs. As with previous assessments, the 2005 stock assessment indicated red snapper were overfished and undergoing overfishing in 2003. Under the status quo (No Action), no additional bycatch reduction would be expected. In fact, future reductions in bycatch mortality would probably be less than what is expected from the BRDs currently certified in the fishery, unless the Fisheye BRD is decertified or its position in trawls is more narrowly defined. This statement is supported by recent evaluations of the Fisheye BRD that indicate it is achieving between 11% and 27% and an overall reduction in red snapper bycatch mortality of approximately 9.4% (Table 18).

More importantly, the current criterion is no longer a valid target to the red snapper rebuilding program. The Goodyear (1995) model is no longer used for red snapper stock assessments. The rebuilding target has changed (GMFMC 2004a), and needed reductions in fishing mortality are different. GMFMC (2005) indicated that maintaining the status quo under Alternative 1 would jeopardize the recovery of red snapper, unless only the Jones-Davis BRD is used; and this BRD is much more expensive and labor-intensive to use (see socioeconomic impacts). GMFMC (2005) suggests that without additional mortality reductions from both the shrimp and directed fishery, the red snapper stock will not meet

either short-term or long-term rebuilding targets.

Under the existing certification criterion (Alternative 1), new BRD designs must undergo a rigorous testing procedure in order to be certified. In fact, since the existing BRDs were first certified in 1998, no additional experimental BRDs have been shown to meet the stringent, F-based requirement of a 44% bycatch reduction. Given that several uncertified BRDs demonstrate better overall bycatch reduction than is being observed with the Fisheye BRD, by taking no action, the Council would not be proposing actions that would achieve bycatch reduction of all finfishes to the extent that is technologically achievable through the use of BRDs. Furthermore, because of the rigorous nature of the testing procedure to certify BRDs under the existing criterion, development of particularly productive concepts may cease, and BRD efficiency might never rise above the current level. These likelihoods contradict the Council's stated intent to encourage innovative developments to improve BRDs in an effort to address the requirements of National Standard 9 to minimize bycatch in the fishery to the extent practicable.

Table 18 shows reductions in total finfish and red snapper as well as reductions in CPUE and fishing mortality for the four most popular BRD designs. The percentage of shrimp loss and average per unit price of each BRD are also provided. In the development of GMFMC (1997a) the Fisheye BRD was certified based on operational testing aboard shrimp vessels, and it was shown to meet or exceed the 44% reduction in F for age 0 and age 1 red snapper from the 1984 through 1989 period. However, as previously discussed, recent evaluations aboard commercial trawlers show that it is achieving only approximately a 11% to 27% reduction.

Alternative 2 would maintain a focus on red snapper, but adjust the certification criterion to a more general, attainable, and measurable reduction rate for red snapper in terms of CPUE. The various options under Alternative 2 would establish a more direct, real-time, and quantifiable criterion that is not dependent on a past benchmark. These options would allow the certification of a wider variety of BRDs thus equating to beneficial, indirect biological impacts. Maintaining a specific goal of red snapper reduction would also support attempts to rebuild this overfished stock. Table 1 illustrates the CPUE reductions of red snapper attributable to several widely tested BRD designs. The more effective BRDs have the capability to reduce the catch of juvenile red snapper by 20% or greater. Choosing Alternative 2, Option a (12%) could lead to the certification of BRDs that are inferior to the capabilities of other practical designs and would not likely meet the test of reducing bycatch (at least of red snapper) to the extent that is technologically achievable. Alternative 2, Option c (30%) would ultimately provide the highest overall reduction in bycatch of red snapper, if it can be achieved; however, Table 1 indicates that very few BRD designs have been shown to meet this more stringent requirement. Alternative 2, Option b would establish a bycatch reduction certification criterion of a 20% reduction in CPUE for age 0 and age 1 red snapper. As shown in Table 1 there are a number of BRD choices that would meet or exceed this criterion. Consequently, shrimpers would have greater flexibility to use certified devices that work best under the conditions and locations where they operate. It is also likely that additional BRD designs could be developed to meet this criterion.

Choosing any of the options under Alternative 2 would still require researchers to test BRDs in areas where red snapper are abundant, and to focus the BRD's capabilities on red snapper. This would not provide a good understanding of the efficiency of the BRD throughout the fishery, over a wide range of

fishing conditions and environmental variables. On the other hand, previous studies and ongoing observer programs are providing some data in this regard, albeit not to the level that would be desired. On the other hand and although it is unlikely to occur, new designs developed with the focus of reducing only red snapper bycatch could be less effective in reducing overall finfish bycatch. Should such occur, the Council's goal of fully complying with National Standard 9 would be diminished. However, as shown in Table 1, most BRD designs are more effective in reducing overall finfish bycatch than that of red snapper because juvenile red snapper are attracted to shrimp nets as structure and tend not to want to leave.

Options under Alternative 3 would allow the Council to change the certification criteria to a general finfish reduction requirement. These options would be consistent with the criteria in place for the eastern Gulf off Florida and in the south Atlantic. Additionally, National Standard 9 of the M-SFCMA requires that "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" (16 U.S.C. § 1851(9)). Thus, options under Alternative 3 would more directly address National Standard 9 to reduce bycatch in general.

Changing the bycatch reduction certification criterion as with Alternative 3, Options a or b (10% and 20%, respectively) would allow for the certification of the greatest number of BRDs; however, in the case of Alternative 2, Option a, this choice could lead to the certification of BRDs that do not perform as well as existing designs or foreseeable future designs. Consequently, this option probably would not meet the test of reducing bycatch to the extent that may be considered as technologically achievable. As shown in Table1, Alternative 3, Option b (20% reduction) would allow certification of four of the more popular BRDs that have recently been tested, while Alternative 3, Option c (30% reduction) would only allow certification of two BRD types. Consequently, Option c would have greater positive biological impacts through bycatch reduction, but would impose more negative social and economic impacts unless or until additional BRD designs can be developed and certified. On the other hand, Option c would be consistent with the criteria used in the eastern Gulf, east of 85E30' W. longitude and in the south Atlantic. Alternative 3, Option d would have the greatest impact on reducing overall bycatch if it could be achieved. However, Table 1 indicates that only one of the recently evaluated BRD designs (Jones-Davis) would be capable of achieving this more stringent requirement, and this BRD is sparsely used and relatively unpopular.

For any of the options under Alternative 3, there would be reduced costs of testing BRDs since researchers would not have to focus their testing in areas where red snapper are abundant. On the other hand, there is the need to correlate total finfish bycatch reduction with that of red snapper. Consequently, testing would have to be stratified over a wide range of habitats that would also include that of juvenile red snapper such that a comparison of overall finfish bycatch and red snapper bycatch could be completed. As with Option b under Alternative 2, Alternative 3, Options b or c would probably result in the greatest benefit in terms of positive indirect impacts that can be practically achieved. Alternative 2, Option c and Alternative 3, Option d would lead to a criterion with greater beneficial indirect biological and ecological impacts; however, it is also likely that these higher percentage reductions would result in fewer BRDs being capable of certification.

There are no direct or indirect impacts on protected species from this action regardless of which

alternative is selected. Bycatch of either marine mammals or seabirds is not known to be a problem in the Gulf shrimp fishery. Sea turtles and the smalltooth sawfish would not be affected by the use of a BRD, regardless of its certification, as they are not able to escape through a BRD, and any exclusion would occur via the turtle excluder device (TED), which is located anterior to the BRDs.

A large portion of the fish bycatch, though returned to the water, does not survive. The extent to which bycatch mortality affects the status of most of these stocks is presently unknown. Knowledge of the total shrimp trawl bycatch for a given species is important; however, it is meaningful only when considered in conjunction with data on that species' overall stock size, its bycatch by age class, and the magnitude of its bycatch relative to other sources of directed or non-directed fishing mortality (NMFS 1995). Again, the parameters are not well understood for most species taken as bycatch in shrimp trawls. With a change to the certification criterion, leading to an increase in the number of efficient BRDs available to the fishery, reductions bycatch and bycatch mortality on these stocks are expected and should have a positive biological impact to these various fish stocks.

On the other hand, improved stocks of groundfish species could have a negative effect on the shrimp population based on results of the NMFS ecological modeling of bycatch reduction. Martinez et al. (1996) projected that the effect of requiring BRDs could be a reduction in the biomass of shrimp by 5.9 to 8.2%. These estimates are based on increased predation that could result from an increase in abundance of bottomfish predators and decreased recycling of nutrients if finfish bycatch biomass is reduced by 50%. Martinez et al. (1996) made it clear however, that the model predicted the effects on the shrimp stock biomass and not yield from the fishery. Information to assess the relationship between the model results and catch by fishermen is not available, and any negative effects of increased predation could be "masked" by annual fluctuations in recruitment and landings.

Although large numbers of birds prey on discarded bycatch, there is insufficient information to examine effects of bycatch reduction on predators, such as birds and marine mammals.

5.3 Direct and Indirect Effects on the Economic Environment

Due to its administrative nature, the proposed action does not result in direct effects on the economic environment. However, indirect effects are expected from this action. Positive indirect effects are expected to result from modifications to the BRD certification criterion. Negative indirect effects result from potential BRD replacement costs incurred by shrimp vessel owners.

Under Alternative 1, industry-wide replacement costs are estimated between $6,020,125 and $10,060,175. Replacement costs limited to active qualifying vessels range from $4,622,300 to $7,718,000. Similar replacement costs are expected from Option C under Alternative 2 and Option D under Alternative 3. Management options establishing performance standards that would allow the certification of the Fisheye BRD do not result in replacement costs due to the already widespread use of this device. Vessel owners are not expected to incur BRD replacement expenses if the continued use of the Fisheye BRD were permitted. Management measures that are not expected to result in BRD replacement costs include Options A and B under Alternatives 2 and 3. Under Alternative 3-Option C, replacement costs are expected to range from a minimum of $2,833,000 to a maximum of $10,060,175. Replacement cost estimates limited to active qualifying vessels only vary from $2,175,200 to $7,718,000.

Alternatives seeking to modify current BRD performance standards are expected to result in a more stable and easier to measure certification criterion. This action is anticipated to promote academic and industry involvement in BRD research and development. An increased long term interest will result in the design of more efficient and cost effective BRDs. Greater reductions in bycacth levels and increases in shrimp retention are among benefits expected from future BRD designs. In addition to its positive impacts on the health of red snapper and other stocks commonly caught in shrimp trawls, further reductions in bycatch from shrimp trawling would lessen the need for more stringent regulations such as effort restrictions. Possible future reductions in shrimp loss could improve profitability of shrimp vessel owners. Expected positive effects, though not quantifiable at this time, will more than offset potential BRD replacement costs. Therefore, overall positive indirect effects on the economic environment are expected from the proposed action.

5.4 Direct and Indirect Effects on the Social Environment

The essentially administrative nature of the proposed action suggests that no direct effects on the social environment would result from its implementation. Nonetheless, limited indirect effects may be expected following the adjustment of BRD certification standards. Expected effects may include changes in fishing practices such as type of nets used and haulback procedures.

5.5 Direct and Indirect Effects on the Administrative Environment

There would be only indirect effects to the administrative environment from changing the bycatch reduction certification criterion. With a change to a more direct approach in evaluating BRD performance as with a CPUE or direct weight criterion, there may be increased interest by developers to evaluate the potential of new BRDs. To evaluate new BRDs, developers and researchers would need to submit applications for Letters of Authorization (LOAs) issued by NMFS, maintain records during BRD trials, and submit those records for archival with NMFS. In addition to NMFS administrative activities in reviewing applications and issuing LOAs, NMFS subsequently would be required to evaluate those data to determine if experimental BRDs meet the certification criterion. Following an affirmative decision, NMFS would then certify a BRD design via a notice in the *Federal Register.*

In addition, as part of a proposed rule to implement a change to the BRD certification criterion, NMFS would also publish a proposed change to the BRD Certification Testing Protocol Manual. In accordance with the BRD framework of the shrimp FMP, the manual outlines an established set of procedures under which an experimental BRD is evaluated. The proposed rule associated with this amendment would modify the procedures outlined in the Manual to alleviate several identified impediments to both field sampling and statistical analyses. These impediments were identified by gear researchers, scientists, and fishermen who were attempting to evaluate experimental BRDs under operational conditions aboard shrimp vessels. The proposed rule would modify the Manual to incorporate additional flexibility in the field sampling procedures. Additionally, alternative statistical procedures have been developed to address the issue of uncertainty when evaluating the effectiveness of experimental BRD designs. The restrictions in the sampling procedures prescribed in the existing Manual were intended to reduce uncertainty associated with the observed sample mean reduction rate. However, coupled with the proposed modification to the statistical approach, alternative sampling

procedures that provide flexibility to better meet the logistical constraints of field sampling can be used to successfully evaluate the efficiency of BRD candidates.

5.6 Mitigation Measures

No mitigation measures are necessary for this administrative action. The action does not alter the manner in which the fishery is conducted, and has no direct impacts to the biological, social or administrative environment requiring mitigation.

5.7 Cumulative Effects

Amendment 13, currently approved but not yet implemented, would: establish bycatch reporting methodologies and improve collection of shrimping effort data in the EEZ; require completion of a Gulf Shrimp Vessel and Gear Characterization Form; establish a moratorium on the issuance of commercial shrimp vessel permits with a qualifying date of December 6, 2003; and require reporting and certification of landings during the moratorium. Each of these proposed actions is expected to have a positive, albeit insignificant, long-term effect on the human environment with regard to monitoring and potentially managing bycatch. Establishing a standardized bycatch reporting methodology is expected to help fishery managers to better determine and monitor the type and amount of bycatch occurring in the shrimp fishery, particularly with regard to the required use of electronic logbooks and observers, 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 is expected to 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 is expected to 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. Whether all or some of these effects will be realized in the wake of the devastating impacts of Hurricanes Katrina and Rita following the Council's adoption of Amendment 13 is unknown; however, reporting requirements and the bycatch monitoring actions will probably have the expected impacts.

As noted above, the act of changing the certification criterion does not have any direct impacts to the fishery or the environment. There would be an indirect effect based on which BRDs are subsequently certified or decertified. Recent observations by NMFS indicate that the most commonly used BRD, the Fisheye, when placed relatively far forward in the codend, would meet only the least demanding of the criteria being considered. The Fisheye BRD may meet more demanding criteria if placed farther back in the codend, but suffers from additional shrimp loss. If fishermen were required to change to a different BRD, there would be an initial cost outlay for such a conversion. Bycatch reduction devices considered in this proposed action are anticipated to cost between $45 and $425 each. Nevertheless, given that the BRD would be expected to be functional for at least one or two fishing years, the overall cost of installing the new BRDs would be minimal compared to other gear expenses over a similar period of time, e.g. trawls, doors, cable, etc., and other operating costs during the same time frame. Although the costs of acquiring and installing new and more expensive BRDs would be in addition to existing operating expenses, they would be insignificant by comparison.

5.8 Unavoidable Adverse Effects

The fisheye may meet some of the more demanding criteria proposed herein if placed farther back in the codend. However, some of the certification criteria considered herein would require fishermen to change to a different BRD. Such conversion would result in initial cost outlays. On average, BRDs considered in this regulatory amendment are priced between $45 and $425. However, BRD replacement costs are insignificant when compared with costs for other required gear and operating expenses.

5.9 Irreversible and Irretrievable Commitments of Resources

There are no irreversible or irretrievable commitments to resources from this administrative action. There may be a reduction in both administrative and research costs in evaluating new BRDs by increasing the flexibility of the certification process. Should new BRDs subsequently be certified for use, along with changes to the allowable criteria for the Fisheye BRD, there could be an initial cost outlay to individual vessel owners to purchase and install these new devices. As previously noted, however, such costs would be inconsequential.

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

There are a number of BRD choices that would meet or exceed the proposed certification criterion. Consequently, shrimp fishermen would have greater flexibility to use certified devices that work best under the conditions and locations where they operate. It is also likely that additional BRD designs could be developed to meet this criterion. Proposed adjustments in BRD performance standards are not expected to impact the productivity of shrimp vessels. GMFMC (2005) suggests that without additional mortality reductions from both the shrimp and directed fishery, the red snapper stock will not meet either short-term or long-term rebuilding targets. Changing the BRD certification criterion, with the goal of allowing additional more efficient BRDs into the fishery is intended to help the Council achieve these long-term rebuilding targets for red snapper and to more fully comply with the provisions of National Standard 9 of the M-SFCMA. Additionally, although the status of the majority of the finfish bycatch is unknown, anticipated reductions in fishing mortality on these stocks should have general positive biological and ecological benefits.

5.11 Finding of No Significant Environmental Impact (FONSI)

National Oceanic and Atmospheric Administration Administrative Order 216-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant in making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?

Response: No. The proposed action is administrative in nature, and only indirectly affects the fishery if new BRDs are subsequently certified for use, based on the new criterion. This would not affect the sustainability of the target shrimp species. Penaeid shrimp stocks are short-lived (essentially annual crops) and year-class strength of these populations is influenced primarily by environmental factors rather than by catch rates.

With a change to the certification criterion, leading to an increase in the number of efficient BRDs available to the fishery, reductions in fishing mortality on these stocks of groundfish species could have a negative effect on the shrimp population based on results of the NMFS ecological modeling of bycatch reduction. Martinez et al. (1996) projected that the effect of requiring BRDs could be a reduction in the biomass of shrimp by 5.9% to 8.2%. These estimates are based on increased predation that could result from an increase in abundance of bottomfish predators and decreased recycling of nutrients if finfish bycatch biomass is reduced by 50%. Martinez, et al. (1996) made it clear, however, that the model predicted these effects on the shrimp stock biomass and not yield from the fishery. Information to assess the relationship between the model results and catch by fishermen is not available, and any negative effects of increased predation would likely be far less than the annual fluctuations in recruitment attributable to environmental variables.

2) Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?

Response: No. The proposed action, to change the bycatch reduction certification criterion in accordance with the framework procedures of the Shrimp FMP, is an administrative action with only indirect effects. With this change, it is expected that additional, more generally effective BRDs will be certified for use in the fishery. These BRDs should further reduce the amount of bycatch and bycatch mortality on non-target species taken during shrimping operations. With a change to the criterion, leading to an increase in the number of efficient BRDs available to the fishery, reductions in fishing mortality on these non-target species should increase and have a minor, positive biological impact to these species.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the M-SFCMA and identified in FMPs?

Response: No. The proposed action is administrative and does not alter the manner in which the fishery is conducted. It may lead to an increase in testing of new BRDs for certification, but these tests would be conducted in the same areas and at the same times as normal shrimping operations, and they would not cause any measurable increase in trawling activity.

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

Response: No. The proposed action does not alter the manner in which the fishery is conducted. Consequently, there would be no impacts to public health or safety from this action, adverse or positive.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

Response: No. The proposed action does not alter the manner in which the fishery is conducted, thus it would not have any effect on endangered or threatened species or marine mammals. This administrative action may lead to an increase in testing of new BRDs for certification, but these tests would be conducted in the same areas and at the same times as normal shrimping operations, and they would not cause any measurable increase in trawling activity. Consequently, there would be no adverse impacts to endangered or threatened species, marine mammals, or their habitat from this action. Additionally, bycatch of either marine mammals or seabirds is not known to be a problem in the Gulf shrimp fishery. Sea turtles and the smalltooth sawfish would not be affected by the use of a BRD, regardless of its certification criterion, as they are not able to escape through a BRD, and any exclusion would occur via the TED, which is located anterior to the BRDs.

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

Response: No. The proposed action does not alter the manner in which the fishery is conducted, thus it would not have any direct, substantial effect on biodiversity or ecosystems. This administrative action may lead to an increase in testing of new BRDs for certification, but these tests would be conducted in the same areas and at the same times as normal shrimping operations, and they would not cause any measurable increase in trawling activity. Consequently, there would be no change in benthic productivity.

In the event new and more effective BRDs are certified for use in the fishery, there may be benefits from reduced fishing mortality on the bycatch species. Information available to assess the total impacts across the various levels of the ecosystem is not available. Improved stocks of groundfish species that a currently caught and killed as bycatch could have a negative, albeit not substantial, effect on the shrimp population based on results of the NMFS ecological modeling of bycatch reduction. Martinez et al. (1996) projected that the effect of requiring BRDs could be a reduction in the biomass of shrimp by 5.9% to 8.2%. These estimates are based on increased predation that could result from an increase in abundance of bottomfish predators and decreased recycling of nutrients if finfish bycatch biomass is reduced by 50%. Martinez et al. (1996) made it clear however, that the model predicted the effects on the shrimp stock biomass and not yield from the fishery. Information to assess the relationship between the model results and catch by fishermen is not available, and any negative effects of increased predation could be "masked" by annual fluctuations in recruitment and landings.

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: No. There are no direct social or economic impacts or natural or physical environmental effects to this administrative action. Should new BRDs subsequently be certified for use, along with

changes to the allowable criteria for the Fisheye BRD, there could be an initial cost outlay to individual vessel owners to purchase and install these new devices; however, such costs would be inconsequential. Furthermore, if more effective, low-cost BRDs are certified, there could be positive, long-term social and economic impacts due to reduced costs, greater trawling efficiency, reduced time to cull bycatch and store shrimp catch, etc. In summary, anticipated reductions in bycatch and bycatch mortality should have generally positive biological, social, economic, and ecological benefits.

8) Are the effects on the quality of the human environment likely to be highly controversial?

Response: No. This administrative action, which may indirectly lead to the development and certification of new BRDs, is based on recommendations from the fishing industry and scientists/researchers who have identified problems with certifying new BRDs based on the existing criterion. The proposed changes reflect those recommendations. Changes in regard to the types of BRDs allowed, under the new criterion may result in an initial cost to individual vessel owners, but the overall action is expected to increase flexibility and improve efficiency among users as more choices of effective BRDs are available under the proposed bycatch reduction certification criterion. Furthermore, this action is based on the best scientific information available as part of a suite of actions being taken by the Council to address bycatch in its fisheries.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

Response: No. The action does not change the way in which the fishery is conducted. The proposed action applies only in federal waters, and would not affect any identified on-shore areas. No historic or cultural resources are identified in the federal waters. Several ecologically sensitive areas, such as the Tortugas and East and West Flower Gardens National Marine Sanctuaries, are already closed to shrimping activities, as well as other identified areas containing significant coral resources (GMFMC 2005).

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: No. The action modifies an existing established management measure. Any BRDs certified, based on the new criterion, would meet a certain minimum standard for efficacy.

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: No. The proposed action does not alter the manner in which the fishery is conducted. The proposed action is administrative in nature, and only indirectly affects the fishery if new BRDs are subsequently certified for use, based on the new criterion. The Council may consider future actions to

implement additional bycatch reduction measures for the shrimp fishery if such actions are determined to be needed based on future practicability analyses and the future status of effort. In recent years participation in the fishery has been declining due to economic conditions related to low shrimp prices and high fuel costs. These conditions are expected to continue in the future resulting in even fewer participants, and this decline was accelerated following Hurricanes Katrina and Rita in 2005. The effect of declining participation on effort and bycatch reduction is currently being evaluated, and this analysis will be used to determine if additional action is needed.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Response: No. The action does not change the way in which the fishery is conducted. As it applies to the fishery, it affects only federal waters, and would not affect such identified on-shore areas. No historic or cultural resources that could be affected by allowable shrimping activities are identified in the federal waters.

13) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

Response: No. The action is administrative in nature, and only indirectly affects the manner in which the fishery is conducted through future actions. None of the alternatives to establish a BRD certification criterion would allow the certification of a BRD that would not be expected to result in the introduction or spread of nonindigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

Response: No. The action does not set a precedent, nor have any significant effects in regard to a decision in principle. The action modifies an existing established management measures implement BRD certification criteria that were carefully analyzed for their impacts in Amendments 9 and 10 to the Shrimp FMP. The action better addresses National Standard 9 by broadening the focus of the reduction of bycatch in the shrimp fishery. However, according to the most recent stock assessment for red snapper, bycatch reduction from BRDs is not expected to provide a significant contribution to the rebuilding of the red snapper stock when compared with management measures to control shrimping effort. The need for additional effort controls will be evaluated in the future. (See #11 above)

15) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Response: No. The action is administrative in nature and is consistent with the requirements of the M-SFCMA. It does not conflict or change any identified laws or requirements.

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: No. The proposed action is administrative in nature, and only indirectly affects the fishery if new BRDs are subsequently certified for use, based on the new criterion. As discussed in the "Cumulative Impacts" section herein and #1 and #2 of this section, there should be no adverse impacts to target or non-target species by this action alone or in combination with past or reasonably foreseeable future actions.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for this regulatory amendment in accordance with the framework procedures of the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, it is hereby determined that the action to modify the bycatch reduction device certification criterion will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of a SEIS for this action is not necessary.

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Assistant Administrator for Fisheries, NOAA Date

6.0 REGULATORY IMPACT REVIEW

6.1 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 regulatory amendment to the Shrimp FMP would have on the shrimp industry.

6.2 Problems and Issues in the Fishery

Problems addressed by the proposed regulatory amendment are discussed in Section 2.0 of this document and are included here by reference. In general, problems and issues addressed in this document include the improbable expectations set by the current bycatch reduction certification criterion for red snapper from penaeid shrimp trawling in the EEZ and the limited number of BRDs certifiable under the existing criterion. Presently certified BRDs may not be meeting the necessary performance requirements. In addition, the existing performance standard, which is based on reduction in red snapper fishing mortality, is volatile and statistically difficult to measure.

6.3 Objectives

This regulatory amendment aims to further reduce red snapper bycatch by establishing flexible and consistent performance standards for the certification of BRDs for the penaeid shrimp fishery in the Gulf of Mexico EEZ west of Cape San Blas, Florida. BRD certification standards that would result from this action are expected to be more flexible, less volatile and easier to measure than existing requirements. The added flexibility is expected to foster the certification of more devices.

6.4 Description of the Fishery

This section presents information on the social and economic aspects of the EEZ shrimp fishery. A presentation of state shrimp fisheries, which are not affected by this amendment, can be found in Amendment 13 (GMFMC 2005). This section updates and summarizes a description of the shrimp fishery completed for Amendment 13 (GMFMC 2005). The harvesting sector, which is the sector directly impacted by management measures considered in this regulatory amendment, is the focus of the following description. Summary information on dealers/wholesalers and processors [1] is also presented. Landings and vessel participation and physical characteristics data were compiled from NMFS' Gulf Shrimp Landings File (SLF) and Vessel Operating Units File (VOUF), respectively.

6.4.1 The Gulf Shrimp EEZ Fishery

The devastating impacts of past hurricane seasons have fundamentally changed the composition and behavior of the shrimp fishery, its communities and supporting infrastructure throughout the Gulf of Mexico. The evaluation of the storms' impacts and the characterization of the current state of the industry are ongoing. In a recently adopted amendment to the shrimp FMP (GMFMC 2005), the Gulf Council elected to establish a moratorium on the issuance of federal shrimp vessel permits. It is impossible to accurately predict the number of eligible vessels that will apply for a moratorium permit. For these reasons, the following discussion is based on information collected prior to the 2005 hurricane season and focuses on qualifying vessels, i.e., vessels that are eligible to receive a moratorium permit.

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

Analyses conducted in Amendment 13 (GMFMC 2005) indicated that 2,666 vessels would qualify for a moratorium permit. A detailed statistical description of the universe of qualifying vessels is presented in Tables 3through 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 qualifying vessels, the fact that most 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 75% 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 the heterogeneity observed in the revenue distribution of qualifying vessels 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. Small vessels are also older on average, indicating the trend towards the 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 about 80% for large vessels, but only slightly more than 57% 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.

6.4.2 Economic Status of the Gulf EEZ Shrimp Fishery's Harvesting Sector

As noted in various publications and the media coverage, the Gulf shrimp fishery has been in economic decline for several 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 higher 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 revenues and/or profit per unit of effort are 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 and mortgage payments, 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 evaluate the impacts of recent changes in TED regulations (NMFS 2002b), 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 [2]. At least for the large vessel sector, profits turned into losses by the end of 2001. The deteriorating trend appears to have continued, exacerbated by increases in fuel prices. According to average price data reported by the Bureau of Labor Statistics (BLS)[3], from May 2002 to May 2006, seasonally adjusted fuel prices increased by 39.2%.

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

The analyses clearly indicate that rapidly declining prices have been one of the principal sources 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%). Across all shrimp size categories, a 14% decline in nominal prices was observed between 2002 and 2004. Due to inflation, reported 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) tariffs 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

[2] 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.

[3] http://www.bls.gov/ppi/home.htm

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 most shrimp imports into the U.S. and the presence of relatively significant duties on shrimp imports into the European Union (E.U.) 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. According to the most recently available data[4], between 2001 and 2005, shrimp imports increased by 50% in weight. This increase in quantity imported was accompanied by a 33% reduction in imported shrimp nominal prices. Undoubtedly, the surge in import quantities has led to further erosion in the domestic industry's market share and additional price declines.

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 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

[4] Shrimp import data can be found at http://www.st.nmfs.gov/st1/trade/cumulative_data/TradeDataProduct.html Statistics cited in this report were based on data posted as of June 26, 2006.

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.

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 were not incorporated into the model and analysis. 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. Moreover, projections discussed above did not account for the adverse impacts resulting from natural disasters such as hurricanes. 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.

6.4.3 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 12. In 2004, 745 dealers were identified in the SLF data. Note that this figure is considerably higher than in previous, recent years. For example, in 2002, there were 626 dealers. Between 1999 and 2001, this figure was in the 310 to 320 range. These sharp increases are 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. 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" and become small dealers by obtaining licenses themselves in order to sell directly to the public. The heterogeneity observed in annual shrimp quantities and sales per dealer/wholesaler supports this conclusion. Coefficients of variation computed for shrimp quantities and sales in 2004 were 2.78 and 3.04, respectively. In other terms, for annual shrimp sales in 2004, the standard deviation equaled 304% of the mean. Average annual food shrimp sales were estimated at $482,632 per dealer.

6.4.4 Gulf Shrimp Processing Sector

Summary descriptive statistics for employment, overall volume and sales, and food shrimp volume and

sales are presented in Table 13. As with the harvesting and dealer sectors, there is considerable heterogeneity within the processing sector regarding employment, volume, and sales. The magnitude of the standard deviations relative to the corresponding means illustrates that fact. In 2004, average shrimp values were estimated at $9,846,092 per processor. Employment figures indicate that, on average, each processor employs 61 persons. Overall, 3,666 persons were employed in the shrimp processing sector in 2004, which represents a 14.3% decline compared to 2002.

The data also indicate 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[5]. 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 61 between 1980 and 2004. 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 continue to narrow; and consolidation will continue to occur as additional firms exit and remaining firms attempt to compensate by increasing their output.

6.5 Impacts of the Management Alternatives

This section presents a detailed analysis of economic impacts associated with management measures considered in this regulatory amendment. When possible, quantitative information is provided. If quantitative information is not available or cannot be derived using accepted economic techniques, a qualitative analysis will be provided.

6.5.1 Modifications to the Bycatch Reduction Criterion for BRDs used in the Penaied Shrimp Fishery in the Western Gulf of Mexico (West of Cape San Blas,

[5] 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.

Florida)

Under existing regulations, the performance of BRDs considered for NMFS certification is evaluated based on the percentage reduction in juvenile red snapper (ages 0 and 1) mortality that they can achieve. In addition to the status quo, this regulatory amendment considers two other alternatives.

Table 18 summarizes the performance of bycatch reduction devices tested in the Gulf of Mexico. Performance standards reported include the percent reduction in juvenile red snapper mortality, in CPUE on juvenile red snapper, and in total finfish bycatch (by weight). The percentage of shrimp loss and the average unit price of each BRD are also provided. For the reduction criteria and average shrimp loss, 95% confidence intervals are provided.

Table 19 lists BRDs that would be certifiable under different performance standards. Minimum performance requirements presented are based on alternative BRD certification criteria considered in this regulatory amendment.

Data presented in Section 5.4 on the physical characteristics of qualifying vessels estimate the average number of nets per vessel per trip at 3.5. Additional information provided by Travis (personal communication, 2006) allows a more precise assessment of the number of nets used per vessel per trip. More than three quarters of qualifying vessels (78.3%) are quad-rigged, i.e., use four nets per vessel. The proportion of vessels that predominantly uses 2 nets per vessel is estimated at 19.9%. The remaining 1.8% of qualifying vessels predominantly uses one net per vessel. Personal communications from shrimp vessel owners and industry leaders (Sal Versaggi, Dennis Henderson, Wilma Anderson) and NMFS scientists (Dan Foster) indicate that on average, quad-rigged vessels require between 6 and 10 BRDs per vessel per year. These figures include spare and lost or damaged devices. Thus, on average, the total number of BRDs required by the 2,087 quad-rigged qualifying vessels ranges from 12,522 to 20,870. The following analysis also assumes that double-rigged vessels require an average of 3 to 5 BRDs per vessel. Consequently, the total number of BRDs required for the 532 qualifying vessels using 2 nets per vessel varies from 1,596 and 2,660. The remaining 47 qualifying vessels use one net per vessel and are assumed to require between 1 and 3 BRDs per vessel. The number of bycatch reduction devices required for this remaining group varies from 47 to 141 devices. Overall, the number of bycatch reduction devices required for the 2,666 qualifying vessels ranges from 14,165 to 23,671. These figures estimate the maximum number of BRDs that could be replaced under some of the management alternatives considered in this regulatory amendment.

The estimation of a minimum number of BRDs that could potentially be replaced is warranted by the uncertainty surrounding the number of eligible shrimp permit holders that will actually apply for a moratorium permit upon implementation of Amendment 13. Currently, the number of active qualifying vessels constitutes the best proxy for the minimum number of vessels that would request a moratorium permit. Data provided by Travis (personal communication, 2006) indicate that 23.6% of the 2,666 qualifying vessels were inactive in 2004. For active qualifying vessels, quad-rigged and double-rigged vessels account for 78.8% and 20%, respectively. As previously indicated for quad-rigged and double-rigged vessels, the number of BRD required annually per vessel range from 6 to 10 and 3 to 5, respectively. Thus, on average, the total number of BRDs required by the 1,605 active quad-rigged qualifying vessels ranges from 9,630 to 16,050. The total number of BRDs required for the 407 active qualifying double-rigged vessels varies from 1,221 to 2.035. The remaining 25 active qualifying vessels

use one net per vessel and are assumed to require between 1 and 3 BRDs per vessel. The number of bycatch reduction devices required for this remaining group varies from 25 to 75 devices. Overall, the average number of bycatch reduction devices required for the 2,037 active qualifying vessels ranges from 10,876 to 18,160 devices.

Alternative 1 would maintain the status quo and continue to rely on the percentage reduction in juvenile red snapper mortality to evaluate BRD performance. Based on recent studies conducted under real-time conditions aboard commercial shrimp vessels, the Jones-Davis BRD is the only device that meets the current performance standard. Thus, the selection of this alternative could result in the decertification of the Fisheye BRD. Assuming the decertification of the Fisheye BRD and its replacement by the Jones-Davis device, the status quo alternative would indirectly result in adverse economic impacts on shrimp trawlers.

Precision levels associated with estimated average shrimp loss (expressed in percentage points) reported for each BRD may not allow an adequate measurement of differences in shrimp losses that may exist between bycatch reduction devices since the current estimates indicate no statistically significant difference. Future testing, with increased sample sizes, may identify statistically significant differences in shrimp loss between alternative devices. However, until such time as further testing is completed, the analysis in this document relies on existing confidence intervals and assumes no statistically significant differences between average percentages of shrimp loss.

Hence, BRD replacement costs, which would be borne by shrimp vessel owners, constitute the only adverse economic impact associated with this alternative. As indicated in Table 1, the average per unit price of the Jones-Davis BRD is $425. Consequently, maximum BRD replacement costs would vary from $6,020,125 to $10,060,175, based on the estimated number of BRDs needed for the number of qualifying vessels previously discussed. Lower bound estimates, based on the number of active qualifying vessels, would range from $4,622,300 to $7,718,000.

Alternative 2 would base BRD certification on the device's recorded percentage reduction in CPUE on ages 0 and 1 red snapper. Minimum performance thresholds considered under this alternative include a 12%, 20%, and 30% reduction in CPUE on juvenile red snapper. Certifiable BRDs under each performance standard are indicated in Table 2.

Option a This option would certify BRDs that achieve at least a 12% reduction in CPUE on juvenile red snapper. This modification of the performance standard is expected to result in the certification of more devices. The Fisheye BRD installed between 8.5' and 10.5' from the codend, the original and modified versions of the Jones-Davis BRD, and the extended funnel BRDs would be certifiable. Average per unit prices range from a minimum of $45 for the Fisheye BRD to a maximum of $425 for the original Jones-Davis BRD. If qualifying vessel owners were to replace the fisheye with the Jones-Davis device, maximum replacement costs would total between $6,020,125 and $10,060,175. Lower bound estimates, based on the number of active qualifying vessels, would range from $4,622,300 to $7,718,000. However, replacement costs are expected to be null or minimal because Fisheye BRDs are already on board the quasi-totality of shrimp vessels. The only potential increase in costs would occur if vessel owners voluntarily change to more expensive BRDs. Such action is unlikely given the current economic conditions in the shrimp fishery as previously discussed.

Option b Under this option, certifiable BRDs would have to achieve a minimum reduction of 20% in CPUE on ages 0 and 1 red snapper. Three BRDs, including the Fisheye BRD installed between 8.5' and 10.5' from the codend, the Jones-Davis BRD, and its modified version, meet this performance standard. On average, per unit prices vary from a minimum of $45 for the Fisheye BRD to a maximum of $425 for the original Jones-Davis BRD. As in Option A, replacement costs are expected to be close to zero due to the already widespread use of the Fisheye BRD. As economic agents, shrimp vessel owners are not expected to incur additional expenses to replace BRDs if previously purchased devices meet the certification criterion.

Option c This option would set one of the most stringent performance standards for the certification of bycatch reduction devices. A minimum reduction of 30% in CPUE on juvenile red snapper would be required from certifiable devices. Of the BRDs tested in the Gulf of Mexico, the Jones-Davis model is the only device that would meet this standard. However, at an average per unit price of $425, the Jones-Davis BRD is also the most expensive of the BRDs considered. Overall replacement costs under this option would range from $6,020,125 to $10,060,175. For active qualifying vessels only, replacement costs would range from $4,622,300 to $7,718,000. If implemented, this option would also eliminate discrepancies between the Eastern and Western Gulf performance standards.

Alternative 3 would use percentage reductions in total finfish bycatch (by weight) to evaluate the performance of BRDs considered for certification. Total finfish reduction levels discussed under this alternative increase in 10 percentage- point increments from 10% to 40%. Certifiable devices under each option are listed in Table 2.

Option a This option would set the least restrictive performance standard in this regulatory amendment. For certification purposes, it would require a minimum reduction in total finfish bycatch (by weight) of 10%. All BRDs considered would qualify for certification under this option. No replacement costs are expected to be incurred because of the eligibility for certification of the Fisheye BRD, a device that is already used by most of the industry.

Option b Under this option, a minimum reduction in total finfish bycatch of 20% would be required from BRDs considered for certification. The Fisheye BRD positioned between 8.5' and 10.5' from the codend, the original and modified Jones-Davis devices, and the Extended Funnel BRD would qualify for certification. For reasons aforementioned, replacement costs under this option are expected to be nil.

Option c Bycatch reduction devices would have to achieve at least a 30% reduction in total finfish bycatch to be considered for certification under this option. If it were selected, this option would lead to the decertification of all Fisheye BRDs. Devices eligible for certification would include the original and modified versions of the Jones-Davis BRD. Average per unit prices would vary from a low of $200 for the modified Jones-Davis BRD to a high of $425 for the original Jones-Davis BRD. Under this option, industry-wide replacement costs would range from a minimum of $2,833,000 to a maximum of $10,060,175. Replacement costs for active qualifying vessels would vary from $2,175,200 to $7,718,000.

Option d BRDs eligible for certification are expected to achieve a minimum reduction in total finfish bycatch of 40%. The Jones-Davis model is the only device that would meet the certification criterion

set under this option. At an average price of $425 per unit, it is the most expensive of the BRDs considered. For qualifying vessel owners, overall replacement costs under this option would vary from $6,020,125 to $10,060,175. Replacement costs for active qualifying vessels are estimated between $4,622,300 and $7,718,000.

Several benefits are expected from management measures considering alternative certification standards (Alternatives 2 and 3). Modifications to the existing BRD certification criterion are expected to result in a less volatile and easier to measure standard and further stimulate academic and industry involvement in BRD performance evaluation and design. In the long run, it is anticipated that this increased interest will result in the design and use of better performing and less expensive devices. Greater reductions in bycacth levels and increases in shrimp retention are among improvements expected from future BRD designs. In addition to its positive impacts on the health of red snapper and other stocks commonly caught in shrimp trawls, further reductions in bycatch from shrimp trawling would afford shrimpers additional protection from more restrictive and potentially costly management measures. In other terms, greater levels of bycatch reduction would lessen the need for more stringent regulations such as effort restrictions. Expected increases in shrimp retention would improve profitability of shrimp operations. Additional beneficial features that could be expected from improved BRD designs include more robust and easier to use devices. Finally, if Alternative 3- Option C were selected, this action would correct inconsistencies existing between the Western and Eastern Gulf performance standards. Overall, though these expected benefits can not be quantified at this time, it appears that they will more than outweigh potential BRD replacement costs.

Summary:

The potential replacement of BRDs suggested in this proposed action does not affect vessel owners' ability to generate income. Under Alternative 1, industry-wide replacement costs are estimated between $6,020,125 and $10,060,175. Replacement costs limited to active qualifying vessels range from $4,622,300 to $7,718,000. Similar replacement costs are expected from Option C under Alternative 2 and Option D under Alternative 3.

Management options establishing performance standards that would allow the certification of the Fisheye BRD are not expected to result in replacement costs due to the already widespread use of this device. Vessel owners are not expected to incur BRD replacement expenses if the continued use of the Fisheye BRD were permitted. Management measures that are not expected to result in replacement costs include Options A and B under Alternatives 2 and 3.

Under Option C-Alternative 3, replacement costs are expected to range from a minimum of $2,833,000 to a maximum of $10,060,175. Replacement cost estimates limited to active qualifying vessels only vary from $2,175,200 to $7,718,000. This option would also eliminate discrepancies between the Western and Eastern Gulf performance standards.

Alternatives seeking to modify current BRD performance standards are expected to result in a more stable and easier to measure certification criterion. This action is anticipated to promote academic and industry involvement in BRD research and development. An increased long term interest will result in the design of more efficient and cost effective BRDs. Greater reductions in bycacth levels and increases in shrimp retention are among benefits expected from future BRD designs. In addition to its positive

impacts on the health of red snapper and other stocks commonly caught in shrimp trawls, further reductions in bycatch from shrimp trawling would lessen the need for more stringent regulations such as effort restrictions. Expected reductions in shrimp loss would improve profitability of shrimp vessel owners. Expected benefits presented above, though not quantifiable at this time, will more than offset potential BRD replacement costs. Therefore, overall indirect positive impacts are expected from this action.

6.6 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. Due to its administrative nature, direct costs are not associated with this action. Costs associated with this specific action will include:

Council costs of document preparation, meetings, and information dissemination	$50,000
NMFS administrative costs of document preparation, Meetings and review	$35,000
Law enforcement costs	$0
TOTAL	$0 to $85,000

The Council and Federal costs of document preparation are based on staff time, travel, printing, and any other relevant items where funds were expended directly for this specific action. There are no permit requirements proposed in this amendment. To the extent that there are no quota closures proposed in this amendment or other regulatory measures, except the setting of the bycatch reduction certification criterion, no additional enforcement activity is anticipated. In addition, under a fixed budget, any additional enforcement activity due to the adoption of this amendment would mean a redirection of resources to enforce the new measures. Maximum indirect costs that could result from potential replacement of bycatch reduction devices are estimated between $6,020,125 and $10,060,175.

6.7 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.

Measures considered in this regulatory amendment aim to further reduce red snapper bycatch by modifying the performance standards that serve as a basis for the certification of bycatch reduction

devices used in the Penaied Shrimp Fishery in the Western Gulf of Mexico (West of Cape San Blas, Florida). This regulatory amendment would establish a consistent and more precisely measurable performance standard.

This action is administrative in nature. As such, it is not associated with any direct costs or impacts. Therefore, this action would not be expected to substantially impact the economy, a sector of the economy, productivity, competition or jobs. Additionally, measures in this action do not adversely affect the environment, public health or safety, or state, local, or tribal governments or communities, nor do they interfere or create inconsistencies with any action of another agency, including state fishing agencies.

No effects on the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof have been identified. Measures in the proposed regulatory amendment represent normal management options or practices and, therefore, do not raise novel legal or policy issues.

Since the proposed rule will not meet any of the conditions listed above, it is determined that the proposed rule, if implemented, would not constitute a "significant regulatory action."

7.0. REGULATORY FLEXIBILITY ACT 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. In addition to analyses conducted for the Regulatory Impact Review (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.

The succeeding analysis is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities."

Description of the reasons why action by the agency is being considered: The purpose and need for the actions recommended in this regulatory amendment are set forth in Section II of this document. In general, problems and issues include the improbable expectations set by the current bycatch reduction certification criterion for red snapper from penaeid shrimp trawling in the EEZ of the Gulf of Mexico west of Cape San Blas, Florida and the limited number of bycatch reduction devices certifiable under the existing criterion. Presently certified BRDs may not be meeting the necessary performance requirements. Moreover, the existing performance standard, which is based on reduction in juvenile red snapper fishing mortality, is volatile and statistically difficult to measure.

This action aims to further reduce red snapper bycatch by establishing flexible and consistent performance standards for the certification of BRDs for the penaeid shrimp fishery in the western Gulf. The added flexibility is expected to increase the number of certifiable devices. In addition, BRD certification standards that would result from this action are expected to be less volatile and therefore easier to measure than existing requirements.

Statement of the objectives of, and legal basis for, the proposed rule: The specific objectives of the proposed actions are also found in Section II of this document, and this section is incorporated here by reference. The objectives are basically the same as the purpose as stated above, and the legal basis for the rule is the M-SFCMA, particularly Sections 303 (a)(3) and 303 (a)(10), as well as regulations under 50 CFR 600.310.

Description and estimate of the number of small entities to which the proposed rule will apply:
The Small Business Administration (SBA) has established size criteria for all major industry sectors in the U.S. including fish harvesting entities. The SBA defines a small business in the commercial fishing activity as a firm with receipts of up to $3.5 million annually. Analyses of revenue distribution for qualifying vessels indicate that average annual gross revenues per vessel total $110,344. Moreover, maximum yearly gross revenues reported by a vessel were $1,045,992; a figure well below the threshold set by the SBA. Thus, all shrimp vessels eligible to receive a moratorium permit are small entities. Due to the uncertainty surrounding the number of eligible shrimp permit holders that will actually apply for moratorium permits, it is not possible to accurately determine the number of small entities that will be impacted by this action. However, to avoid a potential underestimation of this figure, this document considers that the number of small entities that will be impacted by the proposed action is equal to the number of qualifying vessels, i.e., 2,666.

An evaluation of revenue distribution by vessel size indicates substantial differences in yearly average revenues between large (at least 60 feet in length) and small vessels. For the large vessel group, average annual revenues per vessel approximated $140,000. For small vessels, average yearly revenues per vessel were about $27,000. The greater volatility in annual revenues observed for smaller vessels is illustrated by the relative magnitude of the corresponding coefficients of variation. For small and large vessels, coefficients of variation were 1.43 and 0.88, respectively.

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 80.5% for large vessels, but only slightly more than 57.7% 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.

Finally, according to 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 rule, 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: Management measures considered in this regulatory amendment do not affect the reporting or record-keeping requirements for shrimp vessels. This proposed action, which only modifies the performance standards used in BRD certification, does not require additional records or report preparation.

Identification of all relevant Federal rules, which may duplicate, overlap or conflict with the proposed rule: No duplicative, overlapping, or conflicting Federal rules have been identified. Section VI discusses AOther Applicable Laws@, but none are considered to be duplicative, overlapping, or in conflict with those that would implement the proposed regulations. This amendment is similar in most respects to those considered or completed for other fisheries in the Gulf.

Substantial Number of Small Entities Criterion: As indicated above, all qualifying vessels are small entities according to the SBA definition. The threshold of a “substantial” number is clearly met because all 2,666 qualifying shrimp vessels are expected to be impacted by the proposed regulatory action.

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? All individual and entities affected by the proposed action are small entities. Hence, the issue of disproportionality does not apply in this case.

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

Management measures considered in the proposed action are expected to result in nil or marginal increases in the operating costs of qualifying vessels. Options A and B under Alternatives 2 and 3 are not expected to affect operating costs because the continued use of the fisheye BRD would be allowed. The largest potential increase in operating costs would result from Alternative 1 or Option C under Alternative 2 or Option D under Alternative 3. These options would make the use of the Jones-Davis BRD, the most expensive of the bycatch reduction devices, mandatory. This maximum increase in operating costs corresponds to the first-year BRD replacement costs and ranges from $2,550 to $4,250 per vessel per year. This increase would represent between 2.3% and 3.8% of an average vessel's annual revenues. However, due to the administrative nature of the proposed action, potential BRD replacement costs presented above are indirect costs. Therefore, the proposed action does not result in any impact on the profitability of potentially affected entities.

Description of significant alternatives to the proposed rule and discussion of how the alternatives attempt to minimize economic impacts on small entities

The action considered in this document is administrative in nature. Hence, economic impacts resulting from potential BRD replacement are indirect.
Under Alternative 1, which could result in the decertification of the fisheye, industry-wide replacement costs are estimated between $6,020,125 and $10,060,175. Replacement costs limited to active qualifying vessels would range from $4,622,300 to $7,718,000. Option C under Alternative 2 and Option D under Alternative 3 would result in similar replacement costs.

Management options establishing performance standards that would allow the certification of the Fisheye BRD are not expected to result in replacement costs due to the already widespread use of this device. Vessel owners are not expected to incur BRD replacement expenses if the continued use of the Fisheye BRD were permitted. Management measures that are not expected to result in replacement costs include Options A and B under Alternatives 2 and 3.

Under the preferred option (Option C-Alternative 3), replacement costs are expected to range from a minimum of $2,833,000 to a maximum of $10,060,175. Replacement cost estimates limited to active qualifying vessels would vary from $2,175,200 to $7,718,000. The preferred option would also eliminate discrepancies between the Western and Eastern Gulf BRD certification criteria.

Alternatives seeking to modify current BRD performance standards are expected to result in a more stable and easier to measure certification criterion. These alternatives are anticipated to promote academic and industry involvement in BRD research and development. An increased long term interest will result in the design of more efficient and cost effective BRDs. Greater reductions in bycacth levels and increases in shrimp retention are among benefits expected from future BRD designs. In addition to its positive impacts on the health of red snapper and other stocks commonly caught in shrimp trawls, further reductions in bycatch from shrimp trawling would lessen the need for more stringent regulations such as effort restrictions. Expected reductions in shrimp loss would improve profitability of shrimp vessel owners. Expected benefits presented above, though not quantifiable at this time, will more than offset potential BRD replacement costs. Therefore, overall indirect positive impacts are expected from this action.

8.0 OTHER APPLICABLE LAWS

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.

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.

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 alternative to modify the bycatch reduction certification criterion for shrimp trawls in the Gulf of Mexico west of Cape San Blas, Florida, is only an administrative action, and it 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.

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.

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.

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.

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 action proposed in this amendment is only an administrative action with very minor indirect effects, there are no significant impacts that would require the preparation of a SEIS. Consequently, this document includes an EA with a FONSI.

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

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 action proposed in this amendment would have no impact to any national marine sanctuaries because it only involves an administrative action to set BRD performance certification criterion.

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.

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.

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.

Executive Orders

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 action proposed in this amendment. Therefore, consultation with state officials under Executive Order 12612 is not necessary.

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 action proposed in this amendment would not

have this significance.

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 action proposed in this amendment.

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.

E.O. 12962: Recreational

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 action in this amendment.

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

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.

E.O. 13089: Coral Reef

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 action proposed in this amendment because it makes no changes to fishing activities.

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.

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.

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.

9.0. LIST OF PREPARERS

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

List of Agencies:

Gulf of Mexico Fishery Management Council's
- Scientific and Statistical Committee
- Socioeconomic Assessment Panel

National Marine Fisheries Service
- Southeast Fisheries Science Center
- Southeast Regional Office

State Agencies
- Texas Department of Wildlife and Fisheries
- Louisiana Department of Wildlife and Fisheries
- Mississippi Department of Marine Resources
- Alabama Department of Conservation and Natural Resources
- Florida Fish and Wildlife Conservation Commission

Partial List of Organizations:

- Concerned Fishermen of Florida
- Organized Fishermen of Florida
- Coastal Conservation Association
- Southeast Fisheries Association

Responsible Agency:

Gulf of Mexico Fishery Management Council
2203 North Lois Avenue, Suite 1100
Tampa, Florida 33607
813-348-1630

11.0 REFERENCES

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12.0 TABLES

Table 1: Performance and Average Price of Bycatch Reduction Devices Tested in the Gulf of Mexico

BRD TYPE	REDUCTION CRITERION			Shrimp Loss (Percent)	Average Price per Unit
	Percentage Reduction in Red Snapper (Ages 0 - 1) Mortality	Percentage Reduction in CPUE on Red Snapper (Ages 0 - 1)	Percentage Reduction in Total Finfish Bycatch (by weight)		
Fisheye Legal 8.5'-10.5'	**26.6** (5.5 - 47.8)	**26.6** (5.5 - 47.5)	**22.8** (18.0 - 27.5)	**6.3** (4.0 - 8.7)	$45
Fisheye Legal 10.6'-12.5'	**10.8** (-1.3 - 22.9)	**8.8** (1.1 – 16.5)	**13.5** (11.1 – 15.9)	**1.6** (-0.4 - 3.6)	$45
Fisheye – All	**9.4** (3.3 - 15.5)	**6.2** (0.1 - 12.2)	**17.0** (16.1 - 17.9)	**1.2** (0.4 - 2.1)	$45
Jones Davis	**52** (* *)	**40.0** (30.0 – 50.0)	**58.0** (53.0 – 63.0)	**4.0** (0.0 – 9.0)	$425
Modified Jones Davis	**30.6** (25.6 -35.7)	**24.1** (18.6 -29.6)	**33.1** (30.3 – 36.0)	**3.2** (1.4 - 4.9)	$200
Extended Funnel	**25.1** (11.8 – 38.4)	**17.4** (6.5 – 28.2)	**26.6** (21.7 - 31.6)	**2.2** (-1.7 – 6.0)	$350

Source: Dan Foster, NMFS – 95% confidence interval in parentheses; ** based on Goodyear model: confidence interval not available.

Table 2: Certifiable Bycatch Reduction Devices under Considered Management Alternatives

BRD TYPE	**Alternative 1** 44 % Reduction in Red Snapper (Ages 0-1) Mortality	**Alternative 2** Percentage Reduction in CPUE on Red Snapper (Ages 0 - 1)			**Alternative 3** Percentage Reduction in Total Finfish Bycatch (by weight)			
	Status Quo	Option A 12 %	Option B 20 %	Option C 30 %	Option A 10 %	Option B 20 %	Option C 30 %	Option D 40 %
Fisheye Legal 8.5'-10.5'		**X**	**X**		**X**	**X**		
Fisheye Legal 10.6'-12.5'					**X**			
Fisheye – All					**X**			
Jones Davis	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Modified Jones Davis		**X**	**X**		**X**	**X**	**X**	
Extended Funnel		**X**			**X**	**X**		

Table 3. Distribution of Revenues and Selected Statistics for All Qualifying Vessels in 2004.

	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	2,666	2,666	2,666	2,666	2,666	2,666	2,666	2,666	2,666
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0
Maximum	335,132	$647,723	$12,574	$1,042,292	$189,023	$531,209	$1,042,292	$1,045,992	100
Total	104,332,450	$273,832,982	$12,574	$14,606,370	$982,455	$4,742,954	$288,451,926	$294,177,335	N/A
Mean	39,134	$102,713	$5	$5,479	$369	$1,779	$108,197	$110,344	74.2
Standard Dev	42,992	$115,396	$244	$39,829	$6,331	$18,465	$119,496	$119,786	42.8

Source: Mike Travis, NMFS (personal communication, 2006)

Table 4. Physical Characteristics and Selected Statistics for All Qualifying Vessels in 2004.[6]

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length (feet)	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	2,205		2,203	2,664	2,666	2,660	2,665	2,455	1,324
Minimum	1	1	1	1.0	11.0	8.0	10.0	6.0	0.3
Maximum	6	2,201 4	93	104.0	131.0	3,412.0	80,000.0	1,860.0	110.0
Total	7,330.6	7,731.6	114,620.5	52,662.0	175,192.0	1,277,169.0	30,528,944.0	261,856.0	21,657.6
Mean	3.3	3.5	52.0	19.8	65.7	480.0	11,451.3	106.7	16.4
Standard Dev	0.8	0.9	16.9	11.8	16.3	269.2	10,144.7	82.2	13.4

Source: Mike Travis, NMFS (personal communication, 2006)

Table 5: Distribution of Additional Physical Characteristics for All Qualifying Vessels in 2004

[6]The 2003 Vessel Operating Units File (VOUF) was the source of data for hull type, crew size, number of nets, and net size. The Gulf Shrimp Permits database is the source of data for all other characteristics. Characteristics data was not available for every qualifying 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 been provided by the permit owner, or the data is not applicable to particular vessels, as is the case with state registered boats and tonnage.

Hull Type	Percent	Refrigeration	Percent	Gear	Percent
Steel	69.1	Freezer	49.2	Otter Trawl	99.2
Fiberglass	15.2	Ice	49.2	Skimmer Net	0.3
Wood	14.7	Live Well	1.6	Other	0.5
Other	1.0				

Source: Mike Travis, NMFS (personal communication, 2006)

Table 6. Distribution of Revenues and Selected Statistics for Large Qualifying Vessels in 2004

	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	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934
Minimum	0	$0	$0	$0	$0	$0	$0	$0	0
Maximum	335,132	$647,723	$0	$1,042,292	$189,023	$531,209	$1,042,292	$1,045,992	100
Total	92,362,260	$256,544,514	$0	$14,245,996	$975,831	$1,942,175	$270,790,510	$273,708,516	N/A
Mean	47,757	$132,650	$0	$7,366	$505	$1,004	$140,016	$141,525	80.5
Standard Dev	45,063	$121,049	$0	$46,448	$7,429	$16,951	$124,697	$125,033	38.9

Source: Mike Travis, NMFS (personal communication, 2006)

Table 7. Physical Characteristics and Selected Statistics for Large Qualifying Vessels in 2004

	Crew Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	1,869	1,830	1,856	1,932	1,934	1,930	1,933	1,932	989
Minimum	1.0	1.0	2.0	1.0	60.0	8.0	1,000.0	13.0	0.5
Maximum	5.3	4.0	93.0	53.0	131.0	3,412.0	80,000.0	1,860.0	110.0
Total	6,619.8	6,798.2	103,741.3	34,926.0	143,344.0	1,054,625.0	29,400,495.0	242,943.0	19,073.7
Mean	3.5	3.7	55.9	18.1	74.1	546.4	15,209.8	125.7	19.3
Standard Dev	0.6	0.6	13.0	11.1	8.4	268.8	9,456.5	81.9	13.8

Source: Mike Travis, NMFS (personal communication, 2006)

Table 8. Distribution of Additional Physical Characteristics for Large Qualifying Vessels in 2004

Hull Type	Percent	Refrigeration	Percent	Gear	Percent
Steel	83.1	Freezer	64.9	Otter Trawl	99.7
Wood	9.7	Ice	35.1	Other	0.3
Fiberglass	7.0				
Other	0.2				

Source: Mike Travis, NMFS (personal communication, 2006)

Table 9. Distribution of Revenues and Selected Statistics for Small Qualifying Vessels in 2004

	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
Maximum	203,186	$228,590	$12,574	$127,225	$3,881	$322,301	$228,590	$322,301	100
Total	11,970,190	$17,288,468	$12,574	$360,374	$6,624	$2,800,780	$17,661,415	$20,468,819	N/A
Mean	16,353	$23,618	$17	$492	$9	$3,826	$24,128	$27,963	57.7
Standard Dev	25,535	$34,124	$465	$6,638	$175	$21,850	$34,422	$40,041	48.1

Source: Mike Travis, NMFS (personal communication, 2006)

Table 10. Physical Characteristics and Selected Statistics for Small Qualifying Vessels in 2004

	Size	Number of Nets	Net Size (feet)	Vessel Age	Length	Horsepower	Fuel Capacity (gallons)	Gross Tons	Hold Capacity (tons)
Number of vessels	432	431	431	732	732	730	732	523	335
Crew									
Minimum	1	1	8	1.0	11.0	10.0	10.0	6.0	0.3
Maximum	4	4	80	104.0	59.0	3,000.0	15,000.0	330.0	50.0
Total	1,006.6	1,000.6	12,173.4	17,736.0	31,848.0	222,544.0	1,128,449.0	18,913.0	2,583.9
Mean	2.3	2.3	28.2	24.2	43.5	304.7	1,539.7	36.2	7.7
Standard Dev	0.5	0.8	12.8	12.7	10.2	174.9	1,726.8	24.6	6.8

Source: Mike Travis, NMFS (personal communication, 2006)

Table 11. Distribution of Additional Physical Characteristics for Small Qualifying Vessels in 2004

Hull Type	Percent	Refrigeration	Percent	Gear	Percent
Fiberglass	36.6	Ice	86.3	Otter Trawl	97.8
Steel	32.0	Freezer	7.9	Skimmer Net	1.1
Wood	27.9	Live Well	5.7	Other	1.1
Other	3.5				

Source: Mike Travis, NMFS (personal communication, 2006)

Table 12. Selected Statistics for Gulf Food Shrimp Dealers in 2004

	Gulf Food Shrimp Landings	Gulf Food Shrimp Sales
Number of dealers	745	743 [7]
Minimum	1	$7
Maximum	5,357,349	$18,158,018
Total	161,058,094	$358,595,658
Mean	216,185	$482,632
Standard Dev	602,620	$1,466,945

Source: Mike Travis, NMFS (personal communication, 2006)

Table 13. Employment, Production and Value in the Gulf Shrimp Processing Sector, 2004.

	Number of Employees [8]	Total Pounds	Total Product Value	Shrimp Pounds	Value of Shrimp	Shrimp As Percent of Total Product Value
Number of Processors	60	61	61	61	61	61
Minimum	2	789	$6,312	90	$720	0.8
Maximum	416	33,046,021	$104,684,459	30,111,680	$88,328,636	100
Total	3,666	236,052,069	$656,209,747	217,114,784	$600,611,609	N/A
Mean	61	3,869,706	$10,757,537	3,559,259	$9,846,092	87.1
Standard Dev	80	5,883,840	$16,266,088	5,618,175	$14,761,298	28.3

Source: Mike Travis, NMFS (personal communication, 2006)

[7] Two dealers reported their purchases of Gulf food shrimp landings, but did not report the sales value.

[8] One processor did not report employment figures for 2004. An additional eight historical shrimp processors reported that they were still "in operation" but did not process any shrimp in 2004.

Table 14. Gulf Food Shrimp Landings, Sales, and Number of Dealers by Select Communities, Ranked by Sales in 2004 [9]

City	State	Gulf Food Shrimp Landings	Gulf Food Shrimp Sales	Number of Dealers
PORT ARTHUR	TX	11,072,636	$35,786,711	6
PALACIOS	TX	8,138,525	$26,420,130	12
BROWNSVILLE	TX	***	***	2
BAYOU LA BATRE	AL	7,317,291	$21,234,219	16
BILOXI	MS	7,731,454	$20,733,750	7
ABBEVILLE	LA	7,223,617	$18,858,495	14
PORT ISABEL	TX	4,209,110	$14,811,573	12
GOLDEN MEADOW	LA	7,106,854	$14,184,595	16
DULAC	LA	7,351,390	$12,808,423	9
GRAND ISLE	LA	8,539,624	$11,104,653	6
FT MYERS BEACH	FL	3,467,413	$11,068,903	4
PORT BOLIVAR	TX	3,548,392	$10,106,026	5
CHAUVIN	LA	7,802,124	$9,796,974	30
BOOTHVILLE	LA	4,572,036	$8,330,555	3
LAKE CHARLES	LA	4,533,401	$7,909,121	9
VENICE	LA	4,845,619	$7,702,601	6
EMPIRE	LA	5,275,263	$7,100,618	6
FREEPORT	TX	1,912,653	$6,151,094	3
BELLE CHASSE	LA	3,944,856	$5,784,117	7
LAFITTE	LA	4,092,292	$5,593,181	20
BON SECOUR	AL	1,701,705	$5,466,508	7
ARANSAS PASS	TX	1,598,278	$5,242,675	9
CUT OFF	LA	2,326,382	$5,193,636	18
TAMPA	FL	1,519,734	$4,829,043	3
GALVESTON	TX	1,558,608	$4,303,723	6
KEY WEST	FL	2,082,053	$4,210,999	4
CROWN POINT	LA	***	***	1
CAMERON	LA	1,817,939	$2,857,130	31
PORT ST JOE	FL	***	***	1
DELCAMBRE	LA	1,850,013	$2,642,891	10

[9] 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.

SABINE PASS	TX	929,172	$2,616,433	4
THERIOT	LA	2,384,890	$2,519,939	10
MONTEGUT	LA	1,599,652	$2,115,996	13
LOCKPORT	LA	998,704	$1,976,597	6
NEW ORLEANS	LA	1,098,255	$1,728,613	14
TARPON SPRINGS	FL	***	***	2
BAY SAINT LOUIS	MS	1,131,973	$1,530,046	2
MORGAN CITY	LA	647,610	$1,348,935	17
GULFPORT	MS	721,830	$1,317,122	2
PORT SULPHUR	LA	1,131,101	$1,302,418	5
SARASOTA	FL	***	***	1
PASCAGOULA	MS	543,191	$1,204,809	4
PORT LAVACA	TX	510,391	$1,112,123	4
IRVINGTON	AL	371,377	$1,031,021	5
DICKINSON	TX	630,097	$1,021,481	3
SAN LEON	TX	698,241	$935,302	4
SEABROOK	TX	***	***	2
PASS CHRISTI	MS	548,271	$809,688	3
NEW PORT RICHEY	FL	***	***	1
HOPEDALE	LA	576,279	$772,351	4
LAKESHORE	MS	***	***	2
APALACHICOLA	FL	451,798	$754,976	4
THEODORE	AL	318,452	$650,399	3
ST PETERSBURG	FL	***	***	1
HOUMA	LA	547,335	$603,459	21
ST BERNARD	LA	412,396	$567,435	9
FULTON	TX	285,619	$496,000	6
CRYSTAL BEACH	TX	173,596	$483,709	3
CARRABELLE	FL	***	***	2
MATAGORDA	TX	***	***	1
DELACROIX	LA	458,032	$382,996	4
YSCLOSKEY	LA	301,785	$365,452	3
PORT O'CONNOR	TX	230,327	$339,719	4
BAYTOWN	TX	261,896	$333,577	3
INGLIS	FL	***	***	1
CODEN	AL	113,414	$301,737	9

Source: Mike Travis, NMFS (personal communication, 2006)

Table 15. Number of Vessels Supplying Shrimp to Selected Communities, 2004.

City	State	Number of Vessels
GRAND ISLE	LA	639
DULAC	LA	582
GOLDEN MEADOW	LA	580
CHAUVIN	LA	549
LAFITTE	LA	497
VENICE	LA	372
EMPIRE	LA	348
BELLE CHASSE	LA	307
BOOTHVILLE	LA	283
PORT ARTHUR	TX	276
LAKE CHARLES	LA	260
BAYOU LA BATRE	AL	254
PORT SULPHUR	LA	237
MONTEGUT	LA	226
THERIOT	LA	211
ABBEVILLE	LA	211
NEW ORLEANS	LA	207
BILOXI	MS	207
CROWN POINT	LA	206
DELCAMBRE	LA	181
CAMERON	LA	176
PALACIOS	TX	170
BROWNSVILLE	TX	166
CUT OFF	LA	145
LOCKPORT	LA	138
PORT BOLIVAR	TX	136
KEY WEST	FL	128
FREEPORT	TX	118
PORT ISABEL	TX	117
ARANSAS PASS	TX	105
FT MYERS BEACH	FL	103

Source: Mike Travis, NMFS (personal communication, 2006)

Table 16. Number of Qualifying Vessels Supplying Shrimp to Selected Communities, 2004.

City	State	Number of Qualifying Vessels
PORT ARTHUR	TX	229
BAYOU LA BATRE	AL	185
DULAC	LA	160
PALACIOS	TX	160
GRAND ISLE	LA	155
BROWNSVILLE	TX	151
ABBEVILLE	LA	134
GOLDEN MEADOW	LA	130
BILOXI	MS	130
KEY WEST	FL	116
BOOTHVILLE	LA	115
FREEPORT	TX	111
PORT ISABEL	TX	109
FT MYERS BEACH	FL	98
PORT BOLIVAR	TX	96
VENICE	LA	87
ARANSAS PASS	TX	86
LAKE CHARLES	LA	85
CHAUVIN	LA	76
GALVESTON	TX	76
CAMERON	LA	75
DELCAMBRE	LA	70
SABINE PASS	TX	69
CUT OFF	LA	68
BELLE CHASSE	LA	61
EMPIRE	LA	42
BON SECOUR	AL	33
TAMPA	FL	32
LOCKPORT	LA	31
PT ST JOE	FL	28
GULFPORT	MS	28
LAFITTE	LA	27
BAY SAINT LOUIS	MS	26
NEW ORLEANS	LA	24
PORT LAVACA	TX	24

Source: Mike Travis, NMFS (personal communication, 2006)

Table 17. Processed Pounds, Value, and Employment of Gulf Shrimp Processors by Community in 2004, Ranked by Processed Shrimp Value[10]

City	State	Number of Shrimp Processors	Total Processed Pounds	Total Processed Value	Processed Shrimp Pounds	Processed Shrimp Value	Employment	Shrimp as Percent of Processed Value
LAKELAND	FL	1	***	***	***	***	***	84.4
BROWNSVILLE	TX	2	***	***	***	***	***	100.0
BILOXI	MS	8	30,476,972	$74,777,097	30,023,538	$74,543,902	375	99.7
DELCAMBRE	LA	4	21,637,929	$62,382,481	21,637,929	$62,382,481	228	100.0
BAYOU LA BATRE	AL	7	19,792,636	$54,054,148	13,563,813	$43,427,328	221	80.3
DULAC	LA	5	15,999,330	$37,072,098	15,991,050	$37,055,952	162	99.9
PORT ARTHUR	TX	1	***	***	***	***	***	100.0
NEW ORLEANS	LA	1	***	***	***	***	***	100.0
D'IBERVILLE	MS	1	***	***	***	***	***	100.0
MOBILE	AL	1	***	***	***	***	***	100.0
BON SECOUR	AL	2	***	***	***	***	***	77.2
SAN BENITO	TX	1	***	***	***	***	***	100.0
ST PETERSBURG	FL	1	***	***	***	***	***	62.9
DOVER	FL	1	***	***	***	***	***	54.3
PORT ISABEL	TX	1	***	***	***	***	***	100.0
BEAUMONT	TX	1	***	***	***	***	***	100.0
PALACIOS	TX	1	***	***	***	***	***	100.0
CHAUVIN	LA	5	1851731	$6,624,076	1851731	$6,624,076	71	100.0
PORT ST JOE	FL	1	***	***	***	***	***	100.0
GOLDEN MEADOW	LA	2	***	***	***	***	***	100.0
VIOLET	LA	1	***	***	***	***	***	100.0
PASCAGOULA	MS	1	***	***	***	***	***	100.0
HARAHAN	LA	1	***	***	***	***	***	100.0
APALACHICOLA	FL	3	616330	$1,936,861	616330	$1,936,861	12	100.0
TAMPA	FL	1	***	***	***	***	***	53.7

[10] For communities where the number of processors is less than three, information regarding processed pounds, value, and employment are suppressed to protect firms' confidential data. However, dependency on the value of processed shrimp is reported for all communities with shrimp processors.

City	State	Number of Shrimp Processors	Total Processed Pounds	Total Processed Value	Processed Shrimp Pounds	Processed Shrimp Value	Employment	Shrimp as Percent of Processed Value
OCEAN SPRINGS	MS	1	***	***	***	***	***	99.9
KEMAH	TX	1	***	***	***	***	***	27.3
DALLAS	TX	1	***	***	***	***	***	32.8
THERIOT	LA	1	***	***	***	***	***	100.0
CARRABELLE	FL	1	***	***	***	***	***	100.0
PANACEA	FL	1	***	***	***	***	***	9.4
SEADRIFT	TX	1	***	***	***	***	***	0.8

Source: Mike Travis, NMFS (personal communication, 2006)

Table 18. Ranking of Communities in 2004 Based on Strength of Relationship to Gulf Shrimp Fishery, with Special Emphasis on the EEZ Fishery.

Rank	City	State
1	PORT ARTHUR	TX
2	BAYOU LA BATRE	AL
3	BROWNSVILLE	TX
4	BILOXI	MS
5	PALACIOS	TX
6	DULAC	LA
7	CHAUVIN	LA
8	PORT ISABEL	TX
9	GRAND ISLE	LA
10	ABBEVILLE	LA
11	FREEPORT	TX
12	FT MYERS BEACH	FL
13	NEW ORLEANS	LA
14	GOLDEN MEADOW	LA
15	CUT OFF	LA
16	ARANSAS PASS	TX
17	BON SECOUR	AL
18	CAMERON	LA
19	LAFITTE	LA
20	VENICE	LA
21	BOOTHVILLE	LA
22	KEY WEST	FL
23	TAMPA	FL
24	DELCAMBRE	LA
25	LAKE CHARLES	LA
26	EMPIRE	LA
27	PORT LAVACA	TX
28	BELLE CHASSE	LA
29	PORT BOLIVAR	TX
30	GALVESTON	TX
31	IRVINGTON	AL
32	MONTEGUT	LA
33	D'IBERVILLE	MS
34	HOUMA	LA

Source: Mike Travis, NMFS (personal communication, 2006)

Table 19. Communities Determined to be Vulnerable Based on Socioeconomic Attributes, 2004

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	
	Chauvin	
	Cameron	
	Apalachicola	
	Montegut	
	Brownsville	
	Port Lavaca	
	Houma	
	Galveston	

Source: Mike Travis, NMFS (personal communication, 2006)