UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

JAN 22 2010

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act (NEPA), we enclose for your review the Final Environmental Impact Statement (FEIS) for Amendment 31 to the Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico: Addresses Bycatch of Sea Turtles in the Bottom Longline Component of the Reef Fish Fishery.

This FEIS is prepared pursuant to NEPA to assess the environmental impacts associated with NOAA proceeding with regulatory action. The FEIS analyzes the impacts of a range of alternatives intended to reduce sea turtle bycatch in the bottom longline component of the commercial reef fish fishery. The FEIS contains preferred options to establish gear modifications, season-area closures, and a restrictive endorsement program to allow continued participation in the bottom longline component of the reef fish fishery.

Additional copies of the FEIS may be obtained from the Responsible Program Official identified below. The document is also accessible electronically from the Council's Web site at http://www.gulfcouncil.org, or the e-Rulemaking Portal at http://www.regulations.gov.

NOAA is not required to respond to comments received during the agency's 30 day comment period as a result of the issuance of the FEIS. However, comments received by March 8, 2010 will be reviewed and considered for their impact on issuance of a record of decision (ROD). Please send comments to the responsible official identified below. The ROD will be made available publicly following final agency action on or after March 8, 2010.

Written comments should be submitted through mail, facsimile, or via the Federal e-Rulemaking Portal at http://www.regulations.gov (Docket: NOAA-NMFS-2008-0310). All comments received are part of the public record and will generally be posted to http://www.regulations.gov without change. All personal identifying information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information. NOAA Fisheries Service will accept anonymous comments. Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or Adobe PDF file formats only. Written comments submitted during the agency's 30 day public comment period must be received by March 8, 2010. When submitting mailed or faxed comments, include the following document identifier: Comments on Amendment 31.

Responsible Program Official:

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Sincerely,

for Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

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1/11/10

FINAL
AMENDMENT 31
TO THE
FISHERY MANAGEMENT PLAN FOR REEF FISH RESOURCES IN THE GULF OF MEXICO

(Revised)

ADDRESSES BYCATCH OF SEA TURTLES IN THE BOTTOM LONGLINE COMPONENT OF THE GULF OF MEXICO REEF FISH FISHERY

(INCLUDES REVISED FINAL ENVIRONMENTAL IMPACT STATEMENT AND REGULATORY IMPACT REVIEW)

January 2010

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TABLE OF CONTENTS

ABBREVIATIONS USED IN THIS DOCUMENT

ABC	Acceptable Biological Catch
ACL	Annual Catch Limits
ACT	Annual Catch Targets
AP	Advisory Panel
AM	Accountability Measures
B_{MSY}	Stock biomass level capable of producing an equilibrium yield of MSY
BiOp	Biological Opinion
CEA	Cumulative Effects Analysis
CFLP	Coastal Fisheries Logbook Program
CI	Confidence Interval
CMP	Coastal Migratory Pelagics
COI	Certificate of Inspection
Council	Gulf of Mexico Fishery Management Council
CPUE	Catch per unit effort
DEIS	Draft Environmental Impact Statement
DWG	Deepwater Grouper
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
ELMR	Estuarine Living Marine Resources
EM	Electronic Monitoring
EPA	Environmental Protection Agency
ESA	Endangered Species Act
F	Instantaneous rate of fishing mortality
Ft	Feet
F_{MSY}	Fishing mortality rate corresponding to an equilibrium yield of MSY
F_{OY}	Fishing mortality rate corresponding to an equilibrium yield of OY
FEO	Fisheries Economic Office
FMP	Fishery Management Plan
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
GMFMC	Gulf of Mexico Fishery Management Council
GPS	Global Positioning System
GSMFC	Gulf States Marine Fisheries Commission
GW	Gutted Weight
HAPC	Habitat Area of Particular Concern
HMS	Highly Migratory Species
IFQ	Individual Fishing Quota
INBS	Index Nesting Beach Survey
IRFA	Initial Regulatory Flexibility Analysis
ITS	Incidental Take Statement
LNG	Liquefied Natural Gas
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act
mp	Million Pounds
MRFSS	Marine Recreational Fisheries Survey and Statistics

MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
mt	Metric Tons
NMFS	NOAA’s National Marine Fisheries Service
NOR	Net Operating Revenues
NOS	NOAA’s National Ocean Service
OFL	Over Fishing Limit
OY	Optimum Yield
ppt	Parts per Thousand
RA	Regional Administrator
RFA	Regulatory Flexibility Act of 1980
RFEM	Reef Fish Electronic Monitoring
RFFA	Reasonably Foreseeable Future Actions
RFFMP	Reef Fish Fishery Management Plan
RFOP	Reef Fish Observer Program
RIR	Regulatory Impact Review
RPA	Reasonable and Prudent Alternatives
RPM	Reasonable and Prudent Measures
SAV	Submerged Aquatic Vegetation
SBLOP	Shark Bottom Longline Observer Program
SDDP	Supplementary Discard Data Program
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment and Review
SEFSC	Southeast Fisheries Science Center
SEIS	Supplemental Environmental Impact Statement
SEP	Socioeconomic Panel
SERO	Southeast Regional Office
SFA	Sustainable Fisheries Act
SMZ	Special Management Zone
SSBR	Spawning Stock Biomass Per Recruit
SPR	Spawning Potential Ratio
SWG	Shallow-water Grouper
TAC	Total Allowable Catch
TED	Turtle Excluder Device
TEWG	Turtle Expert Working Group
TL	Total Length
USCG	United States Coast Guard
VEC	Valued Environmental Component
VMS	Vessel Monitoring System

Environmental Impact Statement (EIS) Cover Sheet

Responsible Agencies and Contact Persons

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NAME OF ACTION

Amendment 31 Addresses Bycatch of Sea Turtles in the Bottom Longline Component of the Gulf of Mexico Reef Fish Fishery

TYPE OF ACTION

(X) Administrative	( ) Legislative
() Draft	(X) Final

FILING DATES WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA)

Notice of intent to prepare Draft EIS (DEIS) published on: November 25, 2008 (73 FR 71605)
DEIS filed with EPA on: November 6, 2009
DEIS comment period ended on: December 28, 2009

Abstract

National standard 9 of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) requires that the National Marine Fisheries Service (NMFS) minimize bycatch and bycatch mortality to the extent practicable. Additionally, the Endangered Species Act (ESA) requires that the federal government protect and conserve species and populations that are endangered or threatened with extinction, and conserve the ecosystems on which these species depend. A recent observer study by the Southeast Fisheries Science Center estimated hardshell sea turtle takes by the commercial bottom longline component of the Gulf of Mexico reef fish fishery have exceeded the three-year anticipated take levels in the 2005 Biological Opinion. Therefore, the Gulf of Mexico Fishery Management Council (Council) and NMFS developed management measures to reduce hardshell sea turtle takes by the bottom longline component of the reef fish fishery. Actions in this amendment that address ways to reduce hardshell sea turtle interactions with bottom longline gear include: 1) modifying bait; 2) area, depth, and season restrictions; 3) reducing effort through a longline endorsement program; and 4) modifying fishing gear to reduce effort.

TABLE OF CONTENTS FOR EIS

Please note this fishery action is presented as an integrated document. It addresses different applicable laws including the National Environmental Policy Act (NEPA). Therefore, the document does not follow a standard EIS format. However, elements of the EIS are present and identified in the following table of contents for the EIS. Amendment 31 contains 4 actions with a total of 17 alternatives. The amount of analysis required to evaluate these alternatives is thus very extensive, causing the EIS to exceed 150 pages.

LIST OF PREFERRED ALTERNATIVES

Action 1: Allow or Disallow Squid Bait in the Bottom Longline Component of the Reef Fish Fishery

> **<u>Alternative 1</u> –** No action. Do not restrict bait in the bottom longline component of the reef fish fishery

Action 2: Restrict the Use of Bottom Longline Gear for Reef Fish in the Eastern Gulf of Mexico (east of 85°30' W longitude, near Cape San Blas, Florida)

> **<u>Alternative 2</u> –** Establish north-south boundaries for prohibition on the use of bottom longline gear. **<u>Option c</u>:** the entire latitudinal extent of the eastern Gulf

> **<u>Alternative 3</u> –** Establish depth boundaries for prohibition on the use of bottom longline gear. Longline gear would be prohibited shoreward of a line approximating a specific depth contour. **<u>Option b</u>:** 35 fathoms

> **<u>Alternative 4</u>** – Establish seasons for prohibition on the use of bottom longline gear. **<u>Option a</u>:** June-August

Action 3: Longline Endorsements to fish east of Cape San Blas

> **<u>Alternative 4</u>** – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps***** or longline gear of 40,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings. **<u>Option b</u>:** during the 1999-2007 period.

> The transfer of a longline endorsement will be: **<u>sub-option (ii)</u>:** unrestricted between commercial reef fish permit holders

(*) To determine a permit's eligibility for a longline endorsement, reef fish landings using fish traps are considered only if the permit also recorded reef fish landings using longline gear after February 7, 2007.

Action 4: Modify Fishing Practices and Gear for Vessels using Bottom Longline Gear to Harvest Reef Fish east of Cape San Blas

> **<u>Alternative 3</u> –** Limit the number of hooks for vessels that have a longline endorsement to their reef fish permit. **<u>Option b</u>:** 1,000 hooks of which no more than 750 hooks are rigged for fishing or fished.

EXECUTIVE SUMMARY

Results from recent Southeast Fisheries Science Center (SEFSC) observer programs and subsequent analyses indicate the number of loggerhead sea turtle takes authorized in the 2005 Biological Opinion (BiOp) by the bottom longline component of the reef fish fishery in the Gulf of Mexico (Gulf) was exceeded. The west Florida shelf is an important loggerhead sea turtle foraging habitat. Individual loggerhead sea turtles incidentally caught by the longline component of the reef fish fishery are sexually immature juveniles and mature adult loggerhead sea turtles that have high reproductive potential. It is possible that the decline in the annual counts of loggerhead sea turtle nests in peninsular Florida could be explained by a decline in the number of adult female loggerhead sea turtles in the population. The new BiOp being developed by NOAA's National Marine Fisheries Service (NMFS) could result in a jeopardy opinion for loggerhead sea turtles unless action is taken to reduce the impact of the bottom longline component of the reef fish fishery on this threatened species.

Actions in this amendment are needed to provide protection for threatened loggerhead sea turtles in compliance with the Endangered Species Act (ESA) and to reduce loggerhead sea turtle bycatch and bycatch mortality in compliance with National Standard 9 of the Magnuson Stevens Fishery Conservation and Management Act (MSFCMA). National Standard 9 requires that conservation and management measures to the extent practicable minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. The MSFCMA expands on this requirement by 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 Council considered long-term measures to reduce hardshell sea turtle bycatch in this Reef Fish Amendment to the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf. There are four actions in this amendment that analyzed a total of 17 alternatives for reducing sea turtle interactions with bottom longline gear. Many of the alternatives have suboptions. These actions are summarized as follows:

Action 1 would allow or disallow squid bait in the bottom longline component of the reef fish fishery. Some studies have suggested sea turtles prefer squid over finfish. The Council also examined bait size, but this alternative was rejected, due to the lack of information about bait size reducing sea turtle takes as well as concerns about the enforceability. **Preferred Alternative 1** (no action) would allow the current use of baits in the bottom longline component of the reef fish fishery. **Alternative 2** would prohibit the possession of squid or squid parts on a vessel that has reef fish and longline gear aboard, unless the longline gear is "stowed appropriately". Fishing gear appropriately stowed means: A longline may be left on the drum if all gangions and hooks are disconnected and stowed below deck. Hooks cannot be baited. All buoys must be disconnected from the gear; however, buoys may remain on deck [50 CFR 622.34(k)(4)(i)]. **Alternative 2** would allow vessels with longline gear aboard, to vertical line fish with squid provided longline gear was stowed appropriately. Under **Alternative 2**, it is unknown by what percentage loggerhead sea turtle hooking incidents would be reduced;

however, based on both field and laboratory studies there is a potential for reducing loggerhead sea turtle interactions with bottom longline gear.

Action 2 would restrict the use of bottom longline gear for reef fish in the eastern Gulf (east of 85°30' W longitude, near Cape San Blas, Florida). Options under each alternative may be combined with options from other alternatives to achieve greater reductions in loggerhead sea turtle bycatch. **Alternative 1** (no action) would allow bottom longline fishing to proceed in waters greater than 20 fathoms in the eastern Gulf year round unless existing quotas have been met. **Alternative 2** would set north-south boundaries for prohibition of reef fish bottom longline fishing. Three options include area closures between 27° and 28° N latitude, between 26° and 28° N latitude, and the entire eastern Gulf (**Preferred**). The closure of a larger area would displace a greater amount of the fishing effort. Conversely, closure of a smaller area may simply move effort to the open area without decreasing loggerhead sea turtle takes, because loggerhead sea turtle foraging grounds cover most of the eastern Gulf. **Alternative 3** would prohibit the use of bottom longline gear for reef fish shoreward of a line approximating a specific depth contour. Actual implementation would be through a series of point-to-point lines following the approximate isobath, similar to the existing 50 fathom boundary for the longline/buoy gear restricted area. Options under this alternative include lines at 30, 35 (**Preferred**), 40, and 50 fathoms. Eighty-nine percent of foraging destinations of female loggerhead sea turtles were in depths of 50 fathoms or less (A.D. Tucker, Mote Marine Laboratory unpublished data). However, most longline fishing for shallow-water grouper is at these depths as well. **Alternative 4** would prohibit the use of bottom longline gear during specific months. Options include June-August (**Preferred**), April-August, and all months. In multiple studies, observed sea turtle takes by longline gear, sighting rates of hardshell sea turtles, and strandings of hardshell sea turtles in the eastern Gulf increased during spring and summer. The Council's preferred combination of alternatives (i.e., **Alternative 2 Option c, Alternative 3 Option b, and Alternative 4 Option a**) would encompass the time and area where 62% of hardshell sea turtle takes by longline gear were observed (NMFS-SEFSC 2009). Impacts of these alternatives on the physical, biological, and economic environments would depend on the amount of fishing effort that is reduced. Lower levels of fishing effort would result in reduced gear interaction with the bottom. Reduced effort would decrease direct fishing mortality of target species as well as discard mortality of non-target species and undersized target species.

Action 3 would establish an endorsement to use bottom longline gear to fish for reef fish in the eastern Gulf of Mexico. **Alternative 1** (no action) would not establish a longline endorsement to the reef fish permit. **Alternative 1** would allow current longline vessels to continue to operate in the eastern Gulf and not result in any short term adverse economic effects on these participants; this alternative, in tandem with other measures considered, may be insufficient to adequately reduce loggerhead sea turtle interactions, resulting in more severe management changes, with associated adverse economic effects, than those currently considered. For **Alternatives 2-7**, qualifying years for longline endorsements were either 1999-2004 (**Option a**) or 1999-2007 (**Preferred Option b**). In addition, endorsement transferability suboptions were examined (prohibited, unrestricted, or limited). To qualify for a longline endorsement under **Alternative 2** would require a minimum annual average reef fish landings using fish traps or longline gear of 20,000 pounds per permit. **Alternatives 3, 5,** and **6** consider minimum average landings thresholds of 30,000 pounds, 50,000 pounds, and 60,000 pounds per year, respectively. In addition to a minimum annual average reef fish landings requirement, **Alternative 7** considers a community-wide requirement based on the magnitude of red grouper ex-vessel values relative to all species landed in the community. **Preferred Alternative 4** would require annual average landings of 40,000 pounds during 1999-2007 **(Preferred Option b)** to qualify for an endorsement. **Alternatives 2-6**, under both **Options a** and **b**, would be expected to result in reductions in total annual net operating revenues for vessels in the bottom longline reef fish component. These losses would be expected to be reduced as the rate of gear conversion from longline gear to vertical line gear increases for vessels that would not qualify for an endorsement. For all endorsement thresholds and gear conversion assumptions, the expected reduction in total annual net operating revenues increases if the qualifying years are 1999-2004 compared to 1999-2007. Higher minimum annual average landings thresholds result in greater expected adverse economic effects on the fishery. Although **Alternatives 2** and **3** would be expected to result in lower adverse economic effects on fishery participants than the preferred alternative, these alternatives would not be expected to support sufficient reductions in loggerhead sea turtle interactions. **Preferred Alternative 4 – Option b** would strike a balance between reducing interactions between hardshell sea turtles and bottom longline gear and providing opportunities to maintain a bottom longline component that would continue to support shore-side businesses and associated infrastructure dependent on the gear in the eastern Gulf.

Action 4 would modify fishing practices and gear east of Cape San Blas. **Alternative 1** is the no action alternative. Under this alternative the requirements and regulations relative to the commercial bottom longline component of the reef fish fishery would remain unchanged throughout the eastern Gulf. **Alternative 2** would limit mainline length (nautical miles). **Options a-d** under this alternative would limit mainline length to 1, 2, 4, or 5 nautical miles, respectively. All of the options under this alternative are lower than the mean mainline recorded in logbooks and by observer programs, therefore this alternative could reduce loggerhead sea turtle interactions with the bottom longline component of the reef fish fishery if it reduced the overall amount of gear in the water. **Preferred Alternative 3** would limit the number of hooks per vessel. **Options a** and **c** would limit the number of hooks per vessel to 500 or 1,500 hooks, respectively. **Preferred Option b** limits hooks to 1,000 hooks of which no more than 750 hooks are rigged for fishing or fished. Under this alternative all options for number of hooks per vessel are lower than the average number of hooks used by most commercial reef fish fishers in the bottom longline component of the fishery. Any reduction in total hooks could reduce loggerhead sea turtle takes and targeted catch as well as the amount of time needed to haul back the mainline and dehook catch and bycatch. **Alternative 4** would limit gangion length 2, 4, or 6 ft. (**Options a-c**). Anecdotal evidence suggests longer gangion lengths increased the number of hooking incidents. However, further research is needed to determine if there is a significant correlation between gangion length and loggerhead sea turtle hooking and entanglement.

The Council's combined suite of **Preferred Alternatives** in **Actions 2, 3,** and **4** is anticipated to achieve between a 48-67% reduction in effective effort and therefore, interactions between hardshell sea turtles and bottom longline gear. The range in reduction is based on various analyses of effort shifting scenarios in the bottom longline component of the reef fish fishery (NMFS 2009c). **Action 1**: Allow or disallow squid bait in the bottom longline component of the reef fish fishery, the no action alternative was selected as **Preferred**; because little data is available on squid bait reducing sea turtle takes in the bottom longline component of the reef fish fishery. However, with respect to **Actions 2-4**, measures that would reduce loggerhead sea turtle take would have a positive benefit to loggerhead sea turtles. In cases where the alternatives decrease effort, positive benefits on managed reef fish species would likely also occur.

FISHERY IMPACT STATEMENT

To reduce interactions between sea turtles and longline gear and decrease sea turtle takes attributed to the longline component of the reef fish fishery, the proposed action would implement a seasonal closure, establish a longline endorsement to the reef fish permit, and limit the number of hooks per vessel. Collectively, these management measures are anticipated to achieve a 48% to 67% reduction in effective effort and therefore hardshell sea turtle takes in the bottom longline component of the reef fish fishery. Physical, biological, and socio-economic impacts expected from the proposed action are summarized below. Detailed analyses and discussion of these impacts are provided in Section 6.0.

Positive impacts to the biological environment include reductions in bycatch of both hardshell sea turtles and non-targeted or undersized reef fish. Positive impacts to the physical environment include reduced damage to the substrate and the attached benthic organisms, due to consolidated effort and gear limitations. Actions and alternatives in this amendment could also result in participants converting to vertical line gear. If a large number of participants convert to vertical line gear both positive and negative impacts to the physical and biological environment could occur. Vertical line gear has been documented to cause less physical damage than bottom longline gear to the benthic substrate and attached organisms (Barnette 2001). Conversely, vertical line fishers anchor more frequently when fishing with vertical line gear. Anchoring alone can cause greater negative impacts to the physical environment then either gear (Barnette 2001). There are other negative impacts that could occur due to conversion to vertical line gear. For example, vertical line gear has also been documented to have a greater catch-per-unit effort of some fish species currently in rebuilding plans (e.g., gray triggerfish and greater amberjack) as well as other reef fish, such as gag, which is in overfished status (SEDAR 9 2006b; SEDAR 9 2006c; NMFS 2009a; SEDAR 2009b). If a large number of participants convert to vertical line gear and landings of any of these species are substantially increased, a greater amount of bycatch and bycatch mortality for gag and the other species could cause more negative impacts to the biological and ecological environment. However, with these potential negative impacts due to conversion of gear in mind, the preferred actions and alternatives in this amendment are expected to result in overall positive impacts to the physical and biological environment upon implementation.

The proposed management measures are also expected to result in adverse economic impacts for the commercial sector of the reef fish fishery, especially the longline component. The proposed measures are expected to reduce net operating revenues (NOR; ex-vessel revenues net of non-labor trip costs) of commercial vessels that have historically harvested reef fish using bottom longline gear by approximately $1.28-$3.44 million per year, depending on the amount of conversion from longline gear to vertical line gear (the greater amount of gear conversion, the lower the expected reduction in NOR). These estimated losses represent the expected losses under zero ($3.44 million) and 100% ($1.28 million) gear-conversion rates. If averaged across the average number vessels per year with recorded landings of reef fish in the eastern Gulf of Mexico using bottom longline gear from 2003-2007 (149 vessels), the estimated reduction in NOR per vessel ranges from approximately $8,600 to $23,100, or approximately 12 percent to 32 percent of average annual NOR per vessel. Individual vessels may experience higher or lower losses than these averages. Gear conversion to vertical line gear is estimated to cost approximately $13,750 per vessel, though partial financial assistance is available for up to 50 vessels from an environmental advocacy group. Additional economic losses may accrue to the proposed restriction on the number of hooks a bottom longline vessel may carry. Although these costs cannot be quantified with available data, the proposed hook limitations may result in reduced harvest efficiency of some vessels. This would be expected to result in either reduced total harvests or increased costs to maintain normal harvests as fishermen may be required to fish longer or make more sets. Hook limitations also increase the possibility that a trip may have to be terminated early if a line is lost and insufficient replacement hooks are available to allow continued fishing.

The recreational sector of the Gulf of Mexico reef fishery would not be expected to be directly affected by this proposed action. However, the recreational sector could be indirectly affected if the proposed action affects the overall availability, and subsequent catch rates, of reef fish to the recreational sector. Reduction in the total harvest of reef fish, or reductions for certain species, by the commercial sector as a result of this proposed action could increase the amount of reef fish available to recreational anglers. Any increase in recreational catch rates or total harvest as a result of this increased availability would be expected to result in increased social and economic benefits to the recreational sector. Decreased catch rates or total harvest in some distinct geographic areas is also possible, however, if increased pressure from vertical line effort by converted longline vessels results in localized decreased availability of reef fish in areas traditionally accessible to recreational anglers. Which effects might dominate and the determination of a net increase or decrease in social and economic benefits to the recreational sector, and associated industries and communities, however, cannot be determined with available data.

Other Gulf species, such as coastal migratory pelagics, or the vessels that target these species, would not be expected to be directly affected by this proposed action. However, these species, the vessels that target them, and associated shoreside businesses, could be indirectly affected if the proposed action results in effort shift to these species, resulting in increased harvest pressure, increased stock stress, and potentially harmful stock effects. All of the more commonly harvested commercial finfish species, however, are subject to either or both limited access permit requirements or quota management. Limited access permit restrictions would be expected to limit increased harvest pressure because entrance into the fishery would require exit by an existing participant (though effort could increase if a latent permit is purchased and actively fished), while quota management limits the total harvest. As a result, for species subject to either permit or quota restrictions, the effects of effort shift by former bottom longline reef fish vessels should largely be limited to distributional effects; the same quantity of harvests of these newly targeted species, and the revenues associated with these harvests, would be expected to be roughly equivalent to historic harvests, just distributed over different vessels. One species, Spanish mackerel, while quota managed, could easily accommodate increased effort because the commercial quota has not been harvested since the Florida net ban in the 1990's. While a change in the distribution of harvests may potentially adversely affect the profitability of current vessels, adverse stock effects should be minimal to non-existent due to quota management. For species not subject to quota restrictions, such as dolphin or bluefish, increased harvest pressure could result in adverse stock effects and associated adverse economic effects. However, the absence of quotas for species not subject to quota management is an indication of the lack of current commercial importance of these species and, as a result, substantive effort shift to these species would not be expected.

SOCIAL IMPACT STATEMENT

The combined social impacts of the Amendment 31 will substantially reduce the longline fleet in eastern Gulf of Mexico through the endorsement in combination with the seasonal and area closure. A limitation on the number of hooks per vessel will also to a large extent change some fishing behavior. This combined suite of alternatives will provide some relief to the industry as an emergency rule closing all fishing inside of 50 fathoms has been imposed until more permanent regulations could be developed and has significantly affected the fishery. Other actions may be implemented to extend the emergency rule prior to the implementation of this amendment.

Limiting fishing beyond 35 fathoms should reduce sea turtle interactions as approximately 76% of all turtle interactions occurred in less than 35 fathoms as did the majority of longline sets. It is anticipated that all of the longline permit holders with endorsements would shift effort into the areas outside of 35 fathoms. Those vessels without endorsements may convert to vertical line gear in order to continue fishing. However, the conversion to vertical line gear has been difficult and there may be some exit from the fishery as a result. The number of vessels that are able to successfully convert to vertical line gear is unknown and discussed below. The seasonal closure will have an impact, but would be secondary to the others and would likely exacerbate negative impacts that flow from the other actions. It may increase the incentive to switch to vertical line gear for some permit holders.

The endorsement criterion of 40,000 pounds gutted weight of reef fish landings on average during the time period of 1999-2007 will reduce the number of longline vessels eligible to fish the restricted area by approximately 79%. Of those communities that will be impacted the most, Cortez, Florida would have only 25% of its longline vessels still in the fishery while 45% of the Madeira Beach, Florida fleet would remain. Cortez and Madeira Beach are two communities that will be affected more than others primarily because their vessel landings imply a higher reliance upon shallow-water grouper species, especially red grouper. These two communities were also homeport to a large percentage of the longline fleet. Therefore, with the endorsement of 40,000 pounds, there would be a 60% to 75% reduction in longline vessels in Madeira Beach and Cortez respectively, which is a substantial reduction in the number of local vessels, and would impact the gulf-wide production of red grouper if these vessels are unable to convert to vertical line gear.

Limiting the number of hooks will likely change the fishing behavior for a number of vessels as they will reduce the length of their mainline and possibly increase the number of sets to accommodate the reduction in hooks. It has been suggested that 100 hooks per mile was about the minimum used in the fishery as the farther spaced out hooks become the less catch that occurs if fish are congregated around one area. The average mainline length in the fishery today is on average between 6-7 miles, therefore with a maximum of 750 hooks, those operations that used longer mainlines may shorten them to accommodate fewer hooks. With a reduction in mainline length there may be an increased in the number of sets. Such compensation would mean increased activity for the crew and possibly less downtime between sets.

To mitigate the impacts of this suite of alternatives, one of the most obvious changes would be for those vessels without endorsements to change to vertical line fishing gear. The feasibility of a 100% conversion rate of ineligible longline vessels is doubtful since the conversion of several vessels during the emergency rule closure was not successful according to industry representatives. This was due to a rather steep learning curve for longline fishermen in developing the skills to vertical line fish. Although vertical line fishing is not a new technique, longline gear is very efficient at catching many shallow-water grouper species. Whether over time conversion to vertical line gear will increase as individuals become more adept at learning this technique is unknown. As reported by several industry representatives during the amendment process, the losses incurred during the emergency rule closure as captains attempted to vertical line fish were unsustainable and if continued would likely force them to close.

Overall, it is likely that there will be exit from the fishery and increased unemployment in those communities affected the most. Whether there will be any business closures as a result is unknown. It will undoubtedly take some time for the industry to adapt to these changes and given the downturn in the economy, the ability to adapt will depend on numerous factors associated with the resilience and vulnerability of communities and individuals at the time. One factor that will play a role in the ability to adapt will be the Gulf grouper-tilefish Individual Fishing Quota Program. Because this program has been approved and will be implemented January 2010, permit owners will have some security in having ownership in that fishery. Whether that will be enough to ensure their continued participation in the fishery remains to be seen and these actions in conjunction with others could lead to increased consolidation within the fishery.

1.0 INTRODUCTION

1.1 Background

The Gulf of Mexico Fishery Management Council (Council) and NOAA's National Marine Fisheries Service (NMFS) operate under mandates to minimize bycatch to the extent practicable and to protect endangered and threatened species. National Standard 9 of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 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. The bycatch reduction and monitoring requirements in the MSFCMA apply to a broad range of living marine species, including sea turtles.

The Endangered Species Act (ESA) requires that the federal government protect and conserve species and populations that are endangered or threatened with extinction, and conserve the ecosystems on which these species depend. Section 7 of the ESA requires all federal agencies to use their authorities to carry out their programs for the conservation of endangered and threatened species and to ensure any action is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of their critical habitat. The NMFS develops Biological Opinions (BiOps) pursuant to formal consultation under section 7 of the ESA to assess the impact of proposed activities on ESA listed marine species. If the resulting BiOp finds that the proposed activity is likely to result in jeopardy[1] to the species or destruction or adverse modification of its habitat, the BiOp will outline reasonable and prudent alternatives (RPAs) to the action, if any, that would avoid such impacts. For example, if a federally managed fishery resulted in bycatch of a sea turtle species to the extent that the fishery would likely jeopardize the species' continued existence NMFS would be required to implement the relevant RPAs as applicable to protect sea turtles from fishing gear and avoid such jeopardy.

If any incidental take (e.g. bycatch) is anticipated, the BiOp includes an incidental take statement (ITS)[2] specifying the amount or extent of incidental taking that may result from the proposed action, as well as nondiscretionary reasonable and prudent measures (RPMs), and terms and conditions to implement the measures necessary to minimize the takes' impacts. The term ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage a species in any such conduct. Conservation recommendations are also made.
On February 15, 2005, the Southeast Regional Office (SERO) completed the most recent BiOp on the continued authorization of the Gulf of Mexico (Gulf) reef fish fishery managed under the Fishery Management Plan (FMP) for Reef Fish Resources in the Gulf as part of the ESA section

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[1] The term "jeopardy" refers to a determination that a Federal action is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.

[2] The term ''incidental take statement'' means the take of listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant.

7 consultation processes. The reef fish fishery 2005 BiOp identified five species of whales (fin, humpback, sei, northern right, and sperm), six species of sea turtles (loggerhead, leatherback, olive ridley, Kemp's ridley, green, and hawksbill), and two species of fish (smalltooth sawfish and Gulf sturgeon) which occur in the Gulf and are threatened or endangered. The 2005 BiOp concluded authorization of the Gulf reef fish fishery managed under this FMP was not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) and smalltooth sawfish. An ITS was issued specifying the amount and extent of anticipated take on a three-year basis, along with RPM and associated terms and conditions deemed necessary and appropriate to minimize the impact of these takes (Table 1.1.1). The other listed species and designated critical habitat in the Gulf were determined not likely to be adversely affected because they are not likely to occur where the fishery is conducted.

Table 1.1.1. Biological Opinion (2005) anticipated three-year incidental take in the Gulf Reef Fish Fishery.

Species	Amount of Take	Bottom Longline	Commercial Vertical Line	Recreational Vertical Line	Total
Green	Total Take	26	9	16	51
	Lethal Take	13	3	5	21
Hawksbill	Total Take	0	13	31	44
	Lethal Take	0	4	9	13
Kemp's ridley	Total Take	2	0	1	3
	Lethal Take	1	0	0	1
Leatherback	Total Take	1	9	10	20
	Lethal Take	1	4	4	9
Loggerhead	Total Take	85	65	53	203
	Lethal Take	42	20	16	78
Smalltooth sawfish	Total Take	2	2	4	8
	Lethal Take	0	0	0	0

The Council and NMFS took action in Amendment 18A to the Reef Fish FMP (effective September 8, 2006) to comply with the BiOp's RPM that any sea turtle or smalltooth sawfish taken in the reef fish fishery is handled in such a way as to minimize stress to the animal and increase its survival rate. Regulations were implemented requiring sea turtle release gear be onboard reef fish-permitted vessels when fishing to facilitate the safe release of any sea turtles or smalltooth sawfish caught. In addition, vessels with commercial and for-hire reef fish vessel permits were required to possess specific documents providing instructions on the safe release of any sea turtle or smalltooth sawfish caught incidentally with hook-and-line gear. The RPMs also required better data collection from the fishery on incidental takes of hardshell sea turtles.

The SEFSC started observing vessels targeting reef fish in the second half of 2006, and has continued to sample the fishery to date. Data are collected via two different SEFSC observer programs. One program is the Reef Fish Observer Program (RFOP) administered through the SEFSC's Galveston Laboratory and the other program is the Shark Bottom Longline Observer Program (SBLOP) administered by the SEFSC's Panama City Laboratory. The SBLOP was created to obtain better data on catch, bycatch, and discards in the shark bottom longline fishery; however, depending on the time of year and length of the large coastal shark season, vessels participating in this fishery will also target reef fish. In the second half of 2006 the SBLOP started to observe and record sets targeting reef fish. Each program was independently designed and implemented sampling regimes for different, but overlapping portions of the Gulf commercial reef fish fishery. Both the SBLOP and RFOP used random sampling methods in an attempt to get the best sample representative of the fishery.

In 2008, the RFOP administered a voluntary reef fish electronic monitoring (RFEM) project which observed seven trips made by six vessels (Pria et al. 2008). The RFEM was not part of the normal operation of a mandatory observer program; instead it was based on a solicitation for volunteers. Five of the six vessels came from a single port (the other vessel a nearby port) and all observations occurred between mid-March and early May.

In September 2008, NMFS released a report that examined hardshell sea turtle takes by the bottom longline component of the reef fish fishery from July 2006 through 2007 (NMFS-SEFSC 2008). Hardshell sea turtle takes were only observed in the eastern Gulf bottom longline component of the reef fish fishery. Overall, 18 hardshell sea turtle takes were observed in the RFOP and SBLOP, 16 of which were identified as loggerhead sea turtles. Extrapolating the 2006-2007 hardshell sea turtle takes to the entire eastern Gulf using the CFLP data, the number of takes by this segment of the fishery was estimated to be 902 (95% confidence interval (C.I.) 411-1,983) for the 18-month time period (NMFS-SEFSC 2008). Based on the final disposition of the observed hardshell sea turtle captures, estimations for the extrapolated hardshell sea turtle takes were calculated assuming a constant death rate over time. The estimated conditions for the hardshell sea turtles were 401 released alive, 301 released dead, and 200 released with an unknown condition (NMFS-SEFSC 2008).

In April 2009, the SEFSC released an update to the NMFS-SEFSC (2008) report which included 2006-2008 take estimates based on revised effort and observer data from the RFOP, SBLOP, and RFEM. Three sea turtle takes (two loggerhead sea turtles, one unidentified hardshell sea turtle) were recorded in 2008 during RFEM trips; no sea turtle takes were recorded in the RFOP or the SBLOP. Two bycatch estimates were included in NMFS-SEFSC (2009): one that did not consider the RFEM a representative sample of the entire fleet and one that did. The first bycatch estimate extrapolated the 2006-2008 RFOP and SBLOP hardshell sea turtle takes to the entire eastern Gulf and estimated the number of takes by this component of the fishery to be 861 hardshell sea turtles (95% C.I. 384-1,934) for the 30-month time period (NMFS-SEFSC 2009). Based on the final disposition of the 18 observed hardshell sea turtle captures in the RFOP and SBLOP combined and assuming a constant death rate over time, the estimated conditions for the hardshell sea turtles were 410 released alive, 246 released dead, and 205 released with an unknown condition (NMFS-SEFSC 2009). The NMFS-SEFSC (2009) also included a second bycatch estimate which assumed the RFEM data was a representative sample of the bottom longline fishery and included it with the RFOP and SBLOP data. The overall estimated take for all hardshell sea turtles for the 30-month period under this assumption is 967 (95% C.I. 463-2,020). Based on the final disposition of all 21 observed hardshell sea turtle captures and assuming a constant death rate over time, the estimated conditions for the hardshell sea turtles were 460 released alive, 276 released dead, and 230 released with an unknown condition (P. Richards, NMFS-SEFSC personal communication).

To compensate for the low amount of observer coverage in the 2008 RFOP and SBLOP, the hardshell sea turtle take estimates that included the RFEM data were used in this document as the best estimate of bycatch in this component of the reef fish fishery. Without the inclusion of these data, NMFS-SEFSC (2009) report indicated that the 2008 estimates of hardshell sea turtle takes would be biased, because of low observer coverage in the bottom longline component of the reef fish fishery. For example, compared to 2007 observer coverage, the RFOP coverage was reduced by 50% in 2008 and the coverage of the SBLOP was reduced by 20% in 2008. By assuming the RFEM program was a representative sample, the percent increase in observer coverage would be 1.4% of the trips taken in the bottom longline component of the reef fish fishery during Season 1 of 2008 for the eastern Gulf.

The 2005 BiOp authorized 113 hardshell sea turtle cumulative takes by the longline component of the reef fish fishery over a three-year period to account for the variability in the hardshell sea turtle takes between years. Using the estimated takes of 967 hardshell sea turtles over 30-months, the three-year take estimate based on observer data from the RFOP, SBLOP, and RFEM is 1,160 hardshell sea turtle takes. Even though this estimate is somewhat lower than the 2006-2007 estimate in NMFS-SEFSC (2008), the number of estimated takes still exceeds the ITS authorized in the 2005 BiOp.

The observer data indicate a high level of bycatch in the bottom longline component of the reef fish fishery, which exceeds the anticipated take specified in the fishery's ITS. Based on observer-recorded hardshell sea turtle size data, takes included both late stage juvenile and adult loggerhead sea turtles. Satellite telemetry studies of adult female loggerhead sea turtles indicate the importance of the west Florida shelf as benthic foraging habitat. Strandings along the west Florida coast also indicate the importance of the shelf as foraging habitat for loggerhead, Kemp's ridley, hawksbill, leatherback, and green turtles. Based on genetic, telemetry, and tag return data, the loggerhead sea turtles caught in this fishery are from several subpopulations of the southeast U.S. loggerhead sea turtle population, as well as from the nesting population in the Yucatan Peninsula, Mexico (Fish and Wildlife Research Institute (FWRI) 2008; SEFSC 2008).

A number of stock assessments (Turtle Expert Working Group (TEWG) 1998; TEWG 2000; NMFS 2001; Heppell et al. 2003, Conant et al. 2009; TEWG 2009) have examined the status of loggerhead sea turtles in the waters of the U.S., but have been unable to develop any reliable estimates of population size. However, for the past 20 years, the Florida Fish and Wildlife Conservation Commission (FWC) coordinated a detailed loggerhead sea turtle nesting-trend monitoring program, the Index Nesting Beach Survey (INBS). The INBS counts represent approximately 69% of known loggerhead sea turtles nesting in Florida. In addition, Florida accounts for approximately 90% of loggerhead sea turtle nesting activity within the southeastern U.S. nesting population which is considered the world's second largest population. Loggerhead sea turtle nests counted annually at core index nesting beaches in Florida were sampled May 15 through August 31 in Florida from 1989 through 2008 on both the Atlantic and Gulf coasts and indicated a declining trend in loggerhead sea turtle nesting (FWRI 2008; Witherington et al. 2009). The Peninsular Florida nesting assemblage (i.e., FL/GA border through Pinellas County, FL) had a 26% decrease in nests from 1989 through 2008 and a steeper decline of 41% from 1998 to 2008. The nesting assemblage in the northern Gulf (i.e., Franklin County, FL through TX) had a significant 6% decline in nests annually from 1989 through 2008 (Figure 1.1.1). Further information on the index and statewide beaches surveyed in Florida for nesting loggerhead sea turtles go to: http://research.myfwc.com/features/view_article.asp?id=27537 and Witherington et al. (2009).

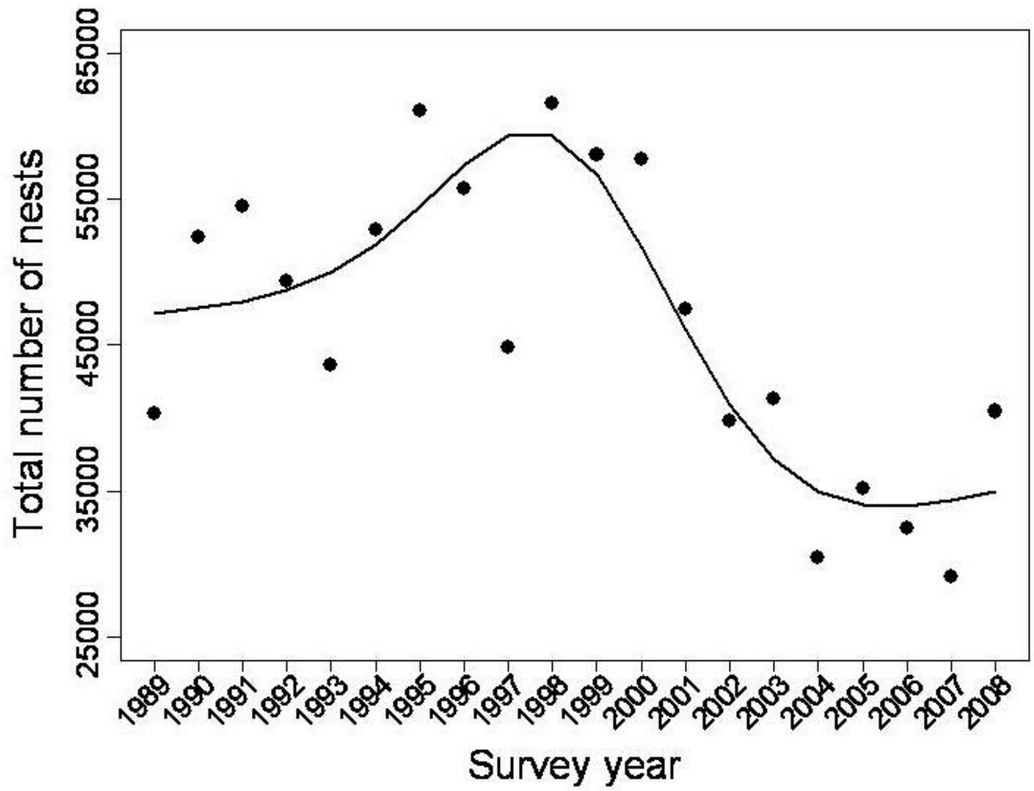

Figure 1.1.1. Annual total nest counts for loggerhead sea turtles on Florida Index beaches, 1989-2008. The trend line was estimated by fitting a five-knot restricted cubic spline curve to the total counts via negative binomial regression (FWRI 2008; Witherington et al. 2009).

On September 3, 2008, SERO's Sustainable Fisheries Division requested the Protected Resources Division reinitiate ESA section 7 consultation on the reef fish fishery. The Council requested at their January 2009 meeting that NMFS develop an emergency rule to reduce number of hardshell sea turtle takes by the bottom longline component of the reef fish fishery in the short term while the Council develops long-term measures through this amendment and associated Environmental Impact Statement (EIS). Several non-governmental organizations (NGOs) subsequently sued NMFS because of alleged ESA violations. An emergency rule, prohibiting bottom longlining for reef fish inshore of the 50-fathom contour, became effective May 18, 2009.

Actions addressed in this amendment are controversial. Opposition to Amendment 31 measures to reduce loggerhead and other hardshell sea turtle take from the bottom longline component of the commercial reef fish fishery has been strong. Industry members were concerned that overly restrictive measures could result in a collapse of commercial fishing infrastructure in some areas. Nevertheless, industry and some NGOs worked cooperatively to develop a suite of options acceptable to all.

1.2 Purpose and Need for Action

The Council is considering measures to reduce bycatch of hardshell sea turtles, particularly loggerhead sea turtles in the bottom longline component of the eastern Gulf of Mexico reef fish fishery. The results of a recent SEFSC observer analysis indicate the number of hardshell sea turtle anticipated takes specified in the 2005 BiOp's ITS has been exceeded by the bottom longline component of the reef fish fishery. The west Florida shelf is an important loggerhead sea turtle foraging habitat. Individuals incidentally caught by the fishery are late stage juvenile and adult loggerhead sea turtles that have high reproductive potential. Information on female loggerhead sea turtle nesting suggests the population is decreasing. The BiOp being developed by NMFS in light of this new information could result in a jeopardy opinion for loggerhead sea turtles unless action is taken to reduce the fishery's impact on this threatened species.

This action is needed to provide protection for threatened loggerhead sea turtles in compliance with ESA and to reduce hardshell sea turtle bycatch and bycatch mortality in compliance with National Standard 9 of the MSFCMA. The ESA requires the federal government to protect and conserve species and populations that are endangered, or threatened with extinction, and to conserve the ecosystems on which these species depend. Section 7(a)(1) of the ESA requires all federal agencies to use their authorities to carry out their programs for the conservation of endangered and threatened species. Section 7(a)(2) of the ESA requires all federal agencies to ensure any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered or threatened species or to result in the destruction or adverse modification of habitat of such species. National Standard 9 under the MSFCMA requires that conservation and management measures to the extent practicable minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. The MSFCMA expands on this requirement by 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)).

Achieving requirements of NEPA Sections 101 and 102(1)

This amendment and associated FEIS address the environmental consequences of and alternatives to the proposed action, the relationship between short-term effects and long-term costs or benefits, and the effect on the future e.g., irreversible and irretrievable commitments of resources. It was prepared via an interdisciplinary plan team (IPT). In these regards the amendment/DEIS achieve the requirements of NEPA Sections 101 and 102(1), which frame a set of environmental, economic, and social goals.

1.3 History of Management

The following summary describes management actions that affect the reef fish fishery in the Gulf. The summary focuses on the major species groups harvested in the eastern Gulf including, shallow-water groupers (SWG), deepwater groupers (DWG), snappers, and tilefishes.

The Reef Fish FMP, including an EIS, was implemented in November 1984. The regulations, designed to rebuild declining reef fish stocks, conserve habitat, and establish a data reporting system, included prohibitions on the use of poisons or explosives, prohibitions on the use of fish traps, roller trawls, and powerhead-equipped spear guns within an inshore stressed area, and directed NMFS to develop data reporting requirements in the reef fish fishery. The FMP estimated a combined maximum sustainable yield (MSY) for all snapper and grouper in aggregate of 51 million pounds (mp), and set the optimum yield (OY) equal to 45 mp, which represented the approximate catch level at the time.

<u>Amendments</u>

Amendment 1 implemented in 1990, set objectives to stabilize long-term population levels of all reef fish species by establishing a survival rate of biomass into the stock of spawning age fish to achieve at least 20% spawning stock biomass per recruit (SSBR) by January 1, 2000. Among the grouper management measures implemented were:

- Set a 20-inch total length (TL) minimum size limit on red grouper, Nassau grouper, yellowfin grouper, black grouper, and gag;

- Set a 50-inch TL minimum size limit on goliath grouper (jewfish);

- Set a five-grouper recreational daily bag limit;

- Set an 11.0 mp commercial quota for grouper, with the commercial quota divided into a 9.2 mp SWG quota and a 1.8 mp DWG quota. SWG were defined as black grouper, gag, red grouper, Nassau grouper, yellowfin grouper, yellowmouth grouper, rock hind, red hind, speckled hind, and scamp. Scamp would be applied to the DWG quota once the SWG quota was filled. DWG were defined as misty grouper, snowy grouper, yellowedge grouper, warsaw grouper, and scamp once the SWG quota was filled. Goliath grouper were not included in the quotas;

- Allowed a two-day possession limit for charter vessels and headboats on trips that extend beyond 24 hours, provided the vessel has two licensed operators aboard as required by the U.S. Coast Guard (USCS), and each passenger can provide a receipt to verify the length of the trip. All other fishermen fishing under a bag limit were limited to a single day possession limit;

- Established a framework procedure for specification of TAC to allow for annual management changes;

- Established a longline and buoy gear boundary at approximately the 50-fathom depth contour west of Cape San Blas, Florida, and the 20-fathom depth contour east of Cape San Blas, inshore of which the directed harvest of reef fish with longlines and buoy gear was prohibited, and the retention of reef fish captured incidentally in other longline operations (e.g., sharks) was limited to the recreational daily bag limit. Subsequent changes to the longline/buoy boundary could be made through the framework procedure for specification of TAC;

- Limited trawl vessels (other than vessels operating in the unsorted groundfish fishery) to the recreational size and daily bag limits of reef fish;

- Established fish trap permits, allowing up to a maximum of 100 fish traps per permit holder;

- Prohibited the use of entangling nets for directed harvest of reef fish. Retention of reef fish caught in entangling nets for other fisheries was limited to the recreational daily bag limit;

- Established the fishing year to be January 1 through December 31;

- Extended the stressed area to the entire Gulf coast; and

- Established a commercial reef fish vessel permit.

Amendment 2 implemented in 1990, prohibited the harvest of goliath grouper to provide complete protection for this species in federal waters in response to indications that the population abundance throughout its range was greatly depressed. This amendment was initially implemented by emergency rule.

Amendment 3 implemented in July 1991, provided additional flexibility in the annual framework procedure for specifying TAC by allowing the target date for rebuilding an overfished stock to be changed. It revised the FMP's primary objective from a 20% SSBR target to a 20% spawning potential ratio (SPR). The amendment also transferred speckled hind from the SWG quota category to the DWG quota category.

Amendment 4 implemented in May 1992, established a moratorium on the issuance of new commercial reef fish permits for a maximum period of three years. Amendment 4 also changed the time of year TAC is specified from April to August and included additional species in the reef fish management unit.

Amendment 5 implemented in February 1994, established restrictions on the use of fish traps, created a special management zone (SMZ) with gear restrictions off the Alabama coast, created a framework procedure for establishing future SMZs, required that all finfish except for oceanic migratory species be landed with head and fins attached, and closed the region of Riley's Hump (near Dry Tortugas, Florida) to all fishing during May and June to protect mutton snapper spawning aggregations.

Amendment 6 implemented in June 1993, extended the provisions of an emergency rule for red snapper endorsements for the remainder of 1993 and 1994, and allowed the red snapper trip limits for qualifying and non-qualifying permitted vessels to be changed under the framework procedure for specification of TAC.

Amendment 7 implemented in February 1994, established reef fish dealer permitting and record keeping requirements, allowed transfer of fish trap permits and endorsements between immediate family members during the fish trap permit moratorium, and allowed transfer of other reef fish permits or endorsements in the event of the death or disability of the person who was the qualifier for the permit or endorsement. A proposed provision of this amendment that would have required permitted vessels to sell harvested reef fish only to permitted dealers was disapproved by the Secretary of Commerce and was not implemented.

Amendment 9 implemented in July 1994, provided for collection of red snapper landings and eligibility data from commercial fishermen for the years 1990 through 1992. This amendment also extended the reef fish permit moratorium and red snapper endorsement system through December 31, 1995, in order to continue the existing interim management regime until longer term measures could be implemented.

Amendment 11 was partially approved by NMFS and implemented in January 1996. The six approved provisions were: (1) limit sale of Gulf reef fish by permitted vessels to permitted reef fish dealers; (2) require that permitted reef fish dealers purchase reef fish caught in Gulf federal waters only from permitted vessels; (3) allow transfer of reef fish permits and fish trap endorsements in the event of death or disability; (4) implement a new reef fish permit moratorium for no more than five years or until December 31, 2000, while the Council considers limited access for the reef fish fishery; (5) allow permit transfers to other persons with vessels by vessel owners (not operators) who qualified for their reef fish permit; and, (6) allow a one time transfer of existing fish trap endorsements to permitted reef fish vessels whose owners have landed reef fish from fish traps in federal waters, as reported on logbooks received by the Science and Research Director of NMFS from November 20, 1992 through February 6, 1994. NMFS disapproved a proposal to redefine OY from 20% SPR (the same level as overfishing) to an SPR corresponding to a fishing mortality rate of F0.1 until an alternative operational definition that optimizes ecological, economic, and social benefits to the Nation could be developed. In April 1997, the Council resubmitted the OY definition with a new proposal to redefine OY as 30% SPR. The resubmission document was disapproved by NMFS.

Amendment 14 implemented in March and April 1997, provided for a ten-year phase-out for the fish trap fishery; allowed transfer of fish trap endorsements for the first two years and thereafter only upon death or disability of the endorsement holder, to another vessel owned by the same entity, or to any of the 56 individuals who were fishing traps after November 19, 1992 and were excluded by the moratorium; and prohibited the use of fish traps west of Cape San Blas, Florida. The amendment also provided the Regional Administrator (RA) of NMFS with authority to reopen a fishery prematurely closed before the allocation was reached, and modified the provisions for transfer of commercial reef fish vessel permits. In addition, the amendment prohibited the harvest or possession of Nassau grouper in the Gulf Exclusive Economic Zone (EEZ), consistent with similar prohibitions in Florida state waters, the south Atlantic EEZ, and the Caribbean EEZ.

Amendment 15 implemented in January 1998, prohibited harvest of reef fish from traps other than permitted reef fish traps, stone crab traps, or spiny lobster traps, and closed the commercial greater amberjack fishery Gulf-wide during the months of March, April, and May.

Amendment 16A submitted to NMFS in June 1998, was partially approved and implemented on January 10, 2000. The approved measures provided: (1) the possession of reef fish exhibiting the condition of trap rash on board any vessel with a reef fish permit that is fishing spiny lobster or stone crab traps is prima facie evidence of illegal trap use and is prohibited except for vessels possessing a valid fish trap endorsement; (2) NMFS establish a system design, implementation schedule, and protocol to require implementation of a vessel monitoring system (VMS) for vessels engaged in the fish trap fishery, with the cost of the vessel equipment, installation, and maintenance to be paid or arranged by the owners as appropriate; and, (3) fish trap vessels submit trip initiation and trip termination reports. Prior to implementing this additional reporting requirement, there will be a one-month fish trap inspection/compliance/education period, at a time determined by the RA and published in the *Federal Register*. During this window of opportunity, fish trap fishermen will be required to have an appointment with NMFS law enforcement for the purpose of having their trap gear, permits, and vessels available for inspection. The disapproved measure was a proposal to prohibit fish traps south of 25.05 degrees north latitude beginning February 7, 2001. The status quo 10-year phase-out of fish traps in areas in the Gulf EEZ was therefore maintained.

Amendment 16B implemented in November 1999 set a recreational daily bag limit of one speckled hind and one warsaw grouper per vessel, with the prohibition on the sale of these species when caught under the bag limit.

Generic Sustainable Fisheries Act Amendment partially approved and implemented in November 1999, set the Maximum Fishing Mortality Threshold (MFMT) for most reef fish stocks at $F_{30\%\ SPR}$. Estimates of MSY, Minimum Stock Size Threshold (MSST), and OY were disapproved because they were based on SPR proxies rather than biomass based estimates.

Amendment 17 was submitted to NMFS in September 1999, and was implemented on August 10, 2000. This amendment extended the commercial reef fish permit moratorium for another five years, from its previous expiration date of December 31, 2000 to December 31, 2005, unless replaced sooner by a comprehensive controlled access system. The purpose of the moratorium is to provide a stable environment in the fishery necessary for evaluation and development of a more comprehensive controlled access system for the entire commercial reef fish fishery.

Amendment 18A was implemented on September 8, 2006, except for VMS requirements which were implemented May 6, 2007. Amendment 18A addresses the following: (1) prohibits vessels from retaining reef fish caught under recreational bag/possession limits when commercial quantities of Gulf reef fish are aboard, (2) adjusts the maximum crew size on charter vessels that also have a commercial reef fish permit and a USCG certificate of inspection (COI) to allow the minimum crew size specified by the COI when the vessel is fishing commercially for more than 12 hours, (3) prohibits the use of reef fish for bait except for sand perch or dwarf sand perch, (4) requires devices and protocols for the safe release in incidentally caught endangered sea turtle species and smalltooth sawfish, (5) updates the TAC procedure to incorporate the Southeast Data Assessment and Review (SEDAR) assessment methodology, (6) changes the permit application process to an annual procedure and simplifies income qualification documentation requirements, and (7) requires electronic VMS aboard vessels with federal reef fish permits, including vessels with both commercial and charter vessel permits.

Amendment 19 also known as the Generic Amendment Addressing the Establishment of the Tortugas Marine Reserves, or Generic Essential Fish Habitat (EFH) Amendment 2, was implemented on August 19, 2002. This amendment establishes two marine reserves off the Dry Tortugas where fishing for any species and anchoring by fishing vessels is prohibited.

Amendment 20 implemented July 2003, established a three-year moratorium on the issuance of charter and headboat vessel permits in the recreational for-hire reef fish and coastal migratory pelagic fisheries in the Gulf EEZ.

Amendment 21 implemented in July 2003, continued the Steamboat Lumps and Madison-Swanson reserves for an additional six years, until June 2010. In combination with the initial four-year period (June 2000-June 2004), this allowed a total of ten years in which to evaluate the effects of these reserves and to provide protection to a portion of the gag spawning aggregations.

Amendment 22 implemented July 5, 2005, specified bycatch reporting methodologies for the reef fish fishery.

Amendment 24 implemented on August 17, 2005, replaced the commercial reef fish permit moratorium that was set to expire on December 31, 2005 with a permanent limited access system.

Amendment 25 implemented on June 15, 2006, replaced the reef fish for-hire permit moratorium that expired in June 2006 with a permanent limited access system.

Amendment 27 implemented February 28, 2008, except for reef fish bycatch reduction measures that became effective on June 1, 2008. This amendment addressed overfishing and stock rebuilding for red snapper. It also required the use of non-stainless steel circle hooks when using natural baits to fish for Gulf reef fish effective June 1, 2008, and required the use of venting tools and dehooking devices when participating in the commercial or recreational reef fish fisheries effective June 1, 2008.

Amendment 29 submitted to NMFS in February 2009, proposes to rationalize effort and reduce overcapacity in the commercial grouper and tilefish fisheries in order to achieve and maintain OY in these multi-species fisheries. Bycatch in the tilefish and grouper fisheries should be reduced, and a flexible and effective integrated management approach for tilefish and the grouper complex and tilefish should follow. Reef Fish Amendment 29 establishes an Individual Fishing Quota (IFQ) program that could be capable of achieving the objectives specified above. A referendum by commercial reef fish fishermen eligible to vote was in favor an IFQ. In addition, Amendment 29 creates dual classification for speckled hind and warsaw grouper into both shallow-water and deepwater categories, and allows for consolidation of reef fish permits. At the January 2009 meeting, the Council deemed Amendment 29 and the proposed rule to be necessary and appropriate and to be forwarded to the Secretary of Commerce for approval and implementation. The NMFS approved the amendment on July 2, 2009.

Amendment 30A implemented August 2008, was developed to stop overfishing of gray triggerfish and greater amberjack. The amendment established ACLs and accountability measures (AMs) for greater amberjack and gray triggerfish. For greater amberjack, it modified the rebuilding plan, increased the recreational minimum size limit, set a zero bag limit for captain and crew of for-hire vessels, and set commercial and recreational quotas. For gray triggerfish, it increased the commercial and recreational minimum size limit and set a commercial quota.

Amendment 30B implemented May 2009, proposes to end overfishing of gag, revise red grouper management measures as a result of changes in the stock condition, establish ACLs and AMs for gag and red grouper, manage SWG to achieve OY, and improve the effectiveness of federal management measures. The amendment (1) defines the gag MSST and OY; (2) set interim allocations of gag and red grouper between recreational and commercial sectors; (3) makes adjustments to the gag and red grouper TACs to reflect the current status of these stocks; (4) establishes ACLs and AMs for the commercial and recreational red grouper fishing efforts, commercial and recreational gag fishing efforts, and commercial aggregate SWG fishing effort; (5) adjusts recreational grouper bag limits and seasons; (6) adjusts commercial grouper quotas; (7) reduces the red grouper commercial minimum size limit; (8) replaces the one month commercial grouper closed season with a six month seasonal area closure at the Edges, a 390 square nautical mile area in the dominant gag spawning grounds; (9) eliminates the end date for the Madison-Swanson and Steamboat Lumps marine reserves; and (10) requires that vessels with federal commercial or charter reef fish permits comply with the more restrictive of state or federal reef fish regulations when fishing in state waters.

Regulatory Amendments, Emergency and Interim Rules

A July 1991 regulatory amendment, implemented November 12, 1991, provided a one-time increase in the 1991 quota for SWG from 9.2 mp to 9.9 mp to provide the commercial sector an opportunity to harvest 0.7 mp that was not harvested in 1990 [56 FR 58188].

A November 1991 regulatory amendment, implemented June 22, 1992, raised the 1992 commercial quota for SWG to 9.8 mp after a red grouper stock assessment indicated that the red grouper SPR was substantially above the Council's minimum target of 20% [57 FR 21751].

An August 1999 regulatory amendment, implemented June 19, 2000, increased the commercial size limit for gag and black grouper from 20 to 24 inches TL, increased the recreational size limit for gag from 20 to 22 inches TL, prohibited commercial sale of gag, black, and red grouper each year from February 15 to March 15 (during the peak of gag spawning season), and established two marine reserves (Steamboat Lumps and Madison-Swanson) that are closed year-round to fishing for all species under the Council’s jurisdiction [65 FR 31827].

An emergency rule, published February 15, 2005, established a series of trip limits for the commercial grouper component of the reef fish fishery in order to extend the commercial fishing season. The trip limit was initially set at 10,000 pounds gutted-weight (GW). If on or before August 1 the fishery is estimated to have landed more than 50% of either the SWG or the red grouper quota, then a 7,500 pound GW trip limit takes effect; and if on or before October 1 the fishery is estimated to have landed more than 75% of either the SWG or the red grouper quota, then a 5,500 pound GW trip limit takes effect [70 FR 8037].

An interim rule, published July 25, 2005, proposed for the period August 9, 2005 through January 23, 2006, a temporary reduction in the recreational red grouper bag limit from two to one fish per person per day, in the aggregate grouper bag limit from five to three grouper per day, and a closure of the recreational sector, from November - December 2005, for all grouper species [70 FR 42510]. These measures were proposed in response to an overharvest of the recreational allocation of red grouper under the Secretarial Amendment 1 red grouper rebuilding plan. The closed season was applied to all grouper in order to prevent effort shifting from red grouper to other grouper species and an increased bycatch mortality of incidentally caught red grouper. However, the rule was challenged by organizations representing recreational fishing interests. On October 31, 2005, a U.S. District Court judge ruled that an interim rule to end overfishing can only be applied to the species that is undergoing overfishing. Consequently, the reduction in the aggregate grouper bag limit and the application of the closed season to all grouper were overturned. The reduction in the red grouper bag limit to one per person and the November-December 2005 recreational closed season on red grouper only were allowed to proceed. The approved measures were subsequently extended through July 22, 2006 by a temporary rule extension published January 19, 2006 [71 FR 3018].

An October 2005 regulatory amendment, implemented January 1, 2006, established a 6,000 pound GW aggregate DWG and SWG trip limit for the commercial grouper fishery, replacing the 10,000/7,500/5,500 step-down trip limit that had been implemented by emergency rule for 2005 [70 FR 77057].

A March 2006 regulatory amendment (GMFMC 2005c), implemented July 15, 2006, established a recreational red grouper bag limit of one fish per person per day as part of the five grouper per person aggregate bag limit, and prohibited for-hire vessel captains and crews from retaining bag limits of any grouper while under charter [71 FR 34534]. An additional provision established a recreational closed season for red grouper, gag and black grouper from February 15 to March 15 each year (matching a previously established commercial closed season) beginning with the 2007 season.

An interim rule was implemented on January 1, 2009, at the request of the Council to reduce overfishing of gag pending implementation of permanent rules under Amendment 30B. Measures in the temporary rule: (1) established a two-fish gag recreational bag limit (recreational grouper aggregate bag limit remained at five fish); (2) adjusted the recreational closed season for gag to February 1 through March 31 (the recreational closed season for red and black groupers remained February 15 to March 15); (3) established a 1.32 mp commercial quota for gag; and (4) required operators of federally permitted Gulf commercial and for-hire reef fish vessels to comply with the more restrictive of federal or state reef fish regulations when fishing in state waters for red snapper, greater amberjack, gray triggerfish, and gag [71 FR 66878].

An emergency rule was implemented May 18, 2009 through October 28, 2009 prohibiting the use of bottom longline gear to harvest reef fish east of 85°30′ W longitude in the portion of the EEZ shoreward of the coordinates established to approximate a line following the 50–fathom (91.4–m) contour as long as the 2009 deepwater grouper and tilefish quotas are unfilled. Once the quotas have been filled, the use of bottom longline gear to harvest reef fish in water of all depths east of 85°30′ W longitude are prohibited [74 FR 20229].

Secretarial Amendments

Secretarial Amendment 1, implemented July 15, 2004, established a rebuilding plan, a 5.31 mp GW commercial quota, and a 1.25 mp GW recreational target catch level for red grouper. The amendment also reduced the commercial quota for SWG from 9.35 to 8.8 mp GW and reduced the commercial quota for DWG from 1.35 to 1.02 mp GW. The recreational bag limit for red grouper was reduced to two fish per person per day. In this amendment bottom longlines were considered for movement out to 50 fathoms which had also been considered under Reef Fish Amendment 18 [54 FR 214].

Secretarial Amendment 2, implemented in July, 2003 for greater amberjack, specified MSY as the yield associated with $F_{30\%\ SPR}$ (proxy for F_{MSY}) when the stock is at equilibrium, OY as the yield associated with an $F_{40\%\ SPR}$ when the stock is at equilibrium, MFMT equal to $F_{30\%SPR}$, and MSST equal to (1-M)*BMSY or 75% of BMSY. It also set a rebuilding plan limiting the harvest to 2.9 mp for 2003-2005, 5.2 mp for 2006-2008, 7.0 mp for 2009-2011, and 7.9 mp for 2012. This was expected to rebuild the stock in seven years. Regulations implemented in 1997 and 1998 (Amendments 12 and 15) were deemed sufficient to comply with the rebuilding plan so no new regulations were implemented [68 FR 39898].

Control Date Notices

Control date notices are used to inform fishermen that a license limitation system or other method of limiting access to a particular fishery or fishing method is under consideration. If a program to limit access is established, anyone not participating in the fishery or using the fishing method by the published control date may be ineligible for initial access to participate in the fishery or to use that fishing method. However, a person who does not receive an initial eligibility may be able to enter the fishery or fishing method after the limited access system is established by transfer of the eligibility from a current participant, provided the limited access system allows such transfer. Publication of a control date does not obligate the Council to use that date as an initial eligibility criteria. A different date could be used, and additional qualification criteria could be established. The announcement of a control date is primarily intended to discourage entry into the fishery or use of a particular gear based on economic speculation during the Council's deliberation on the issues. The following summarizes control dates that have been established for the Reef Fish FMP. A reference to the full *Federal Register* notice is included with each summary.

November 1, 1989 - Anyone entering the commercial reef fish fishery in the Gulf and South Atlantic after November 1, 1989, may not be assured of future access to the reef fish resource if a management regime is developed and implemented that limits the number of participants in the fishery [54 FR 46755].

November 18, 1998 - The Council is considering whether there is a need to impose additional management measures limiting entry into the recreational-for-hire (i.e., charter vessel and headboat) sectors fishing for reef fish and coastal migratory pelagic fish in the EEZ of the Gulf and, if there is a need, what management measures should be imposed. Possible measures include the establishment of a limited entry program to control participation or effort in the recreational-for-hire fisheries for reef fish and coastal migratory pelagic [63 FR 64031] (In Amendment 20 to the Reef Fish FMP, a qualifying date of March 29, 2001, was adopted).

July 12, 2000 - The Council is considering whether there is a need to limit participation by gear type in the commercial reef fish sectors in the EEZ of the Gulf and, if there is a need, what management measures should be imposed to accomplish this. Possible measures include modifications to the existing limited entry program to control fishery participation, or effort, based on gear type, such as a requirement for a gear endorsement on the commercial reef fish vessel permit for the appropriate gear. Gear types which may be included are longlines, buoy gear, handlines, rod-and-reel, bandit gear, spear fishing gear, and powerheads used with spears [65 FR 42978].

October 15, 2004 – the Council is considering the establishment of an IFQ program to control participation or effort in the commercial grouper component of the reef fish fishery of the Gulf. If an IFQ program is established, the Council is considering October 15, 2004, as a possible control date regarding the eligibility of catch histories in the commercial grouper fishery [69 FR 67106].

December 31, 2008 – the Council voted to establish a control date for all Gulf commercial reef fish vessel permits. The control date will allow the Council to evaluate fishery participation and address any level of overcapacity. The establishment of this control date does not commit the Council or NOAA Fisheries Service to any particular management regime or criteria for entry into this fishery. Fishermen would not be guaranteed future participation in the fishery regardless of their entry date or intensity of participation in the fishery before or after the control date under consideration. Comments were requested by close of business April 17, 2009 [74 FR 11517].

2.0 MANAGEMENT ALTERNATIVES

2.1 Action 1: Allow or Disallow Squid Bait in the Bottom Longline Component of the Reef Fish Fishery

Preferred Alternative 1 – No action. Do not restrict bait in the bottom longline component of the reef fish fishery.

Alternative 2 – Prohibit the possession of squid or squid parts on a vessel that has reef fish and longline gear aboard, unless the longline gear is "stowed appropriately", defined below.

Discussion and Rationale

This action establishes alternatives for allowing or disallowing squid bait in the bottom longline component of the reef fish fishery. When observers documented loggerhead sea turtle takes and recorded bait type, 38% of the bait was identified as squid, 19% finfish, and 43% of the bait type was unknown (NMFS-SEFSC 2008; 2009). In addition, when squid bait and hooking location were identified by observers, 88% of the loggerhead sea turtles were hooked in the beak, roof, or jaw (NMFS-SEFSC 2008; 2009). The percentage of loggerhead sea turtles caught on squid bait and hooked in the mouth suggests that they are pursuing the bait and becoming incidentally hooked in the bottom longline gear. Therefore, disallowing squid as bait could reduce sea turtle hooking incidents if they are attracted to squid bait more than other baits used in the bottom longline component of the reef fish fishery.

Besides bait type, the Council also considered an alternative to restrict the bait size as a way to reduce hardshell sea turtle takes. However, there is little information available on the effects of bait size as it pertains to hardshell sea turtle takes. The Council also had concerns about whether a minimum bait size requirement would be enforceable or practical for the bottom longline component of the reef fish fishery. Therefore, this alternative was rejected from further analysis (see Appendix C).

Preferred Alternative 1 (no action) would maintain the same level of biological and ecological impacts currently in the fishery. Cut squid has been used as preferred bait in the bottom longline component for several reasons. One reason is that cut bait reduces costs and another reason is that squid stays on the hook better after long hours of soaking underwater. Bait type could have a direct effect on the number of targeted species hooked and the number of hardshell sea turtles incidentally hooked.

Alternative 2 limits the use of bait type, by not allowing squid or squid parts on a vessel that has reef fish and longline gear aboard, unless the longline gear is appropriately stowed. Fishing gear appropriately stowed means: A longline may be left on the drum if all gangions and hooks are disconnected and stowed below deck. Hooks cannot be baited. All buoys must be disconnected from the gear; however, buoys may remain on deck [50 CFR 622.34(k)(4)(i)]. This regulation would allow vessels with longline gear aboard, to vertical line fish with squid provided longline gear was stowed appropriately.

Loggerhead sea turtles are classified as generalist feeders, but when given the opportunity to feed on finfish or squid they preferred squid. Loggerhead sea turtles tested in the pelagic longline fishery and in captive laboratory experiments preferred dead whole squid over dead whole finfish (Kiyota et al. 2004; Watson et al. 2005; Yokota et al. 2009). Additional studies in the laboratory used smaller loggerhead sea turtles (i.e., 1.5, 1.8, and 2.1 ft. carapace length) and found all sizes of loggerhead sea turtles tested attempted to swallow a higher proportion of hooks baited with whole dead squid over whole dead finfish (Stokes et al. 2006). Researchers suggested captive loggerhead sea turtles were more likely to become hooked by swallowing whole squid which had a tough, but flexible texture. Alternatively, finfish baits were bitten off in smaller pieces and loggerhead sea turtles were able to avoid the hook (Stokes et al. 2006). These studies suggest prohibiting the use of squid or squid parts in the bottom longline component of the reef fish fishery could reduce loggerhead sea turtle interactions with gear, if sea turtles react similarly to pelagic longline gear and captive feeding studies. If **Alternative 2** is selected as preferred, it is unknown by what percentage loggerhead sea turtle hooking incidents would be reduced; however, based on both field and laboratory studies there is a potential for reducing loggerhead sea turtle interactions with gear. Further research is needed to predict the extent of this reduction for the bottom longline component of the reef fish fishery.

Preferred Alternative 1 would not affect the physical, biological, social, or administrative environments relative to current conditions. Prohibiting a particular bait type (**Alternative 2**) could have impacts on the physical and biological environment. For example, limiting bait type may reduce targeted and non-target catches including hardshell sea turtles. If catch per unit effort (CPUE) of the targeted catch is lower using finfish as bait versus squid, fishers are likely to increase effort. This increase in effort could have a negative impact on the physical and biological environments.

Preferred Alternative 1 would not be expected to result in any change in bait usage or other behavioral changes in the short term in the bottom longline component of the reef fish fishery. As a result, no short term adverse economic effects would be expected. However, if bait type is an important factor in the interaction between loggerhead sea turtles and bottom longline gear, **Preferred Alternative 1** could lead to more restrictive management measures in the future, with accompanying greater adverse economic effects than protective action at this time. **Alternative 2** would prohibit the possession of squid or squid parts on vessels that have reef fish and longline gear aboard. This prohibition would be expected to result in fewer interactions between loggerhead sea turtles and longline gear, but could result in adverse economic impacts stemming from increased bait costs, higher labor demands, or possible reductions in CPUE. The magnitude of anticipated reductions in interactions between loggerhead sea turtles and longline gear, the economic value associated with these reductions, and the potential adverse economic impacts to the bottom longline component of the reef fish fishery cannot be quantified at this time. Administrative impacts of these alternatives will primarily be on law enforcement, due to the difficulty in monitoring bait type at sea and at the dock.

2.2 Action 2: Restrict the Use of Bottom Longline Gear for Reef Fish in the Eastern Gulf of Mexico (east of 85°30' W longitude, near Cape San Blas, Florida)

Alternative 1 – No Action. Allow the use of bottom longline gear throughout the eastern Gulf year round in waters seaward of a line approximating the 20 fathom contour.

Preferred Alternative 2 – Establish north-south boundaries for prohibition on the use of bottom longline gear. Options in this alternative may be combined with options from other alternatives to refine these restrictions.

> **Option a**: between 27° and 28° N latitude (approximately Charlotte Harbor to Tarpon Springs, Florida)
> **Option b**: between 26° and 28° N latitude (approximately Naples to Tarpon Springs, Florida)
> **Preferred Option c:** the entire latitudinal extent of the eastern Gulf

Preferred Alternative 3 – Establish depth boundaries for prohibition on the use of bottom longline gear. Longline gear would be prohibited shoreward of a line approximating a specific depth contour. Options in this alternative may be combined with options from other alternatives to refine these restrictions.

> **Option a:** 30 fathoms
> **Preferred Option b:** 35 fathoms
> **Option c**: 40 fathoms
> **Option d**: 50 fathoms

Preferred Alternative 4 – Establish seasons for prohibition on the use of bottom longline gear. Options in this alternative may be combined with options from other alternatives to refine these restrictions.

> **Preferred Option a:** June-August
> **Option b**: April-August
> **Option c**: Year-round

Discussion and Rationale

Alternative 1, no action, would allow bottom longline fishing to proceed in waters greater than 20 fathoms in the eastern Gulf year round unless existing quotas have been met. If the Council had chosen **Alternative 1**, other actions would need to be taken to reduce takes sufficiently to protect and conserve sea turtles.

Alternative 2 may reduce sea turtle takes by setting north-south boundaries for areas closed to reef fish bottom longline fishing. Observer data (NMFS-SEFSC 2009) show most of the sea turtle takes occurred on fishing trips west of the Tampa Bay area (Figure 2.2.1). Studies suggest the foraging grounds and movement patterns of sea turtles frequently coincide with this area. A satellite telemetry study conducted from 1998-2002 (Figure 6.2.2.1) shows the frequency of transmissions from 24 female loggerhead sea turtles tagged at three widely separated beaches in Florida (Schroeder et al. in prep; see Appendix A). Observer data (NMFS-SEFSC 2008; 2009) overlaid on telemetry data indicate probable spatial correlation in sea turtle locations. Data on foraging grounds of female loggerhead sea turtles also show some overlap with areas where sea turtles were captured by longlines in the reef fish fishery (A.D. Tucker, Mote Marine Laboratory unpublished data; see Appendix B).

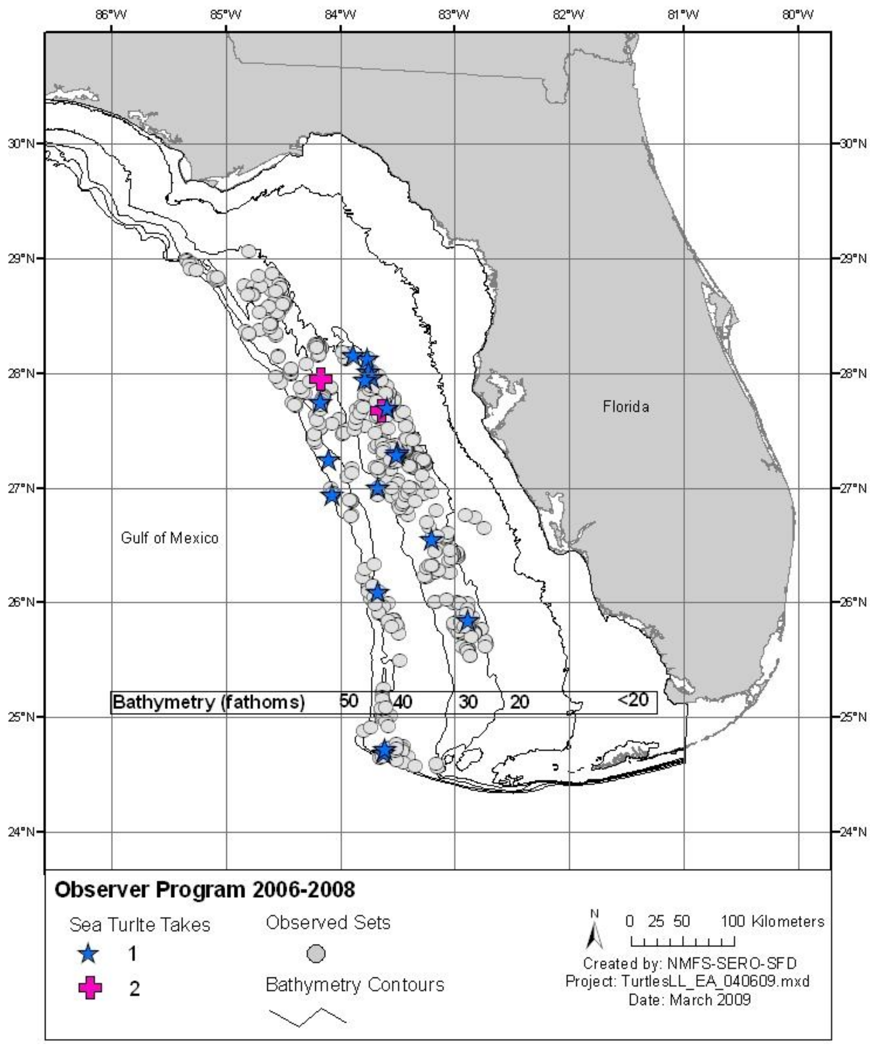

Figure 2.2.1. Map of the eastern Gulf showing locations of longline sets in water depths less than 55 fathoms with observers onboard during 2006-2008 (NMFS-SEFSC 2009).

An area closure with north-south boundaries of 27^{o} and 28^{o} N latitude (**Option a**) would encompass the area where 57% of the sea turtle takes were documented by the observer program, and an area with north-south boundaries of ranging of 26^{o} and 28^{o} N latitude (**Option b**) would encompass the area where 71% of sea turtles were taken (Table 2.2.1). Of longline trips from logbooks reporting SWG landings, 49% were between 27^{o} and 28^{o}

N latitude and 80% were between 26° and 28° N latitude (NMFS 2009a). The closure of a larger area could remove a greater amount of the fishing effort, and thus be more likely to reduce sea turtle takes. Closure of a smaller area may simply move effort to the open area without decreasing sea turtle takes, because sea turtle foraging grounds cover most of the eastern Gulf. Rules for stowage of the longline gear while possessing reef fish in the closed area would be required if transit across the area was allowed. For the Madison/Swanson and Steamboat Lumps closed areas, transit is defined as non-stop progression through the area. Stowage means all gangions and hooks are disconnected and stowed below deck [50 CFR 622.34(k)(4)]. An area closure for the entire latitudinal extent of the eastern Gulf (**Preferred Option c**) would encompass the area where 100% of observed sea turtles were taken and would displace nearly all of the bottom longline SWG fishing effort.

Table 2.2.1. Percent of sea turtle takes recorded by NMFS observers during 2006-2008 within specific depth contours (see Figure 2.2.1). Season*Latitude combines the seasonal takes with the latitudinal areas.

Depth contour (fathoms)						
	≤20	**≤30**	**≤35**	**≤40**	**≤50**	**All depths**
Season						
June - August	4.8	57.1	61.9	76.2	76.2	76.2
April - August	4.8	71.4	76.2	90.5	90.5	95.2
All year	4.8	71.4	76.2	90.5	95.2	100
Latitude (Degrees N)						
27-28	0	47.6	52.4	52.4	57.1	57.1
26-28	0	52.4	57.1	61.9	66.7	71.4
All areas	4.8	71.4	76.2	90.5	95.2	100
Season*Latitude (Degrees N)						
June - August						
27-28	0	38.1	42.9	42.9	42.9	42.9
26-28	0	42.9	47.6	52.4	52.4	52.4
All Areas	4.8	57.1	61.9	76.2	76.2	76.2
April – August						
27-28	0	47.6	52.4	52.4	52.4	52.4
26-28	0	52.4	57.1	61.9	61.9	66.7
All Areas	4.8	71.4	76.2	90.5	90.5	95.2

Source: Reef Fish Observer Program database, Southeast Fisheries Science Center

Alternative 3 would close an area based on depth contours. Actual implementation would be through a series of point-to-point lines following the approximate isobath, similar to the existing longline/buoy gear restricted area (Figure 2.2.2). However, the new restricted area would only affect bottom longline gear. Buoy gear has not been in use in recent years and the 2005 BiOp did not analyze sea turtle takes for this gear. Buoy gear does not have the same potential for sea turtle mortality as longline gear; it is a floating device that could allow a hooked sea turtle to reach the surface. Several longline fishermen have indicated they may begin using buoy gear in the near future. Because some reef fish vessels have other gear onboard in addition to longline gear, and vessels with longline gear would need to cross closed areas to reach shore, transit would need to be allowed. As a result, rules for stowage of the longline gear while possessing reef fish in the closed area would be required.

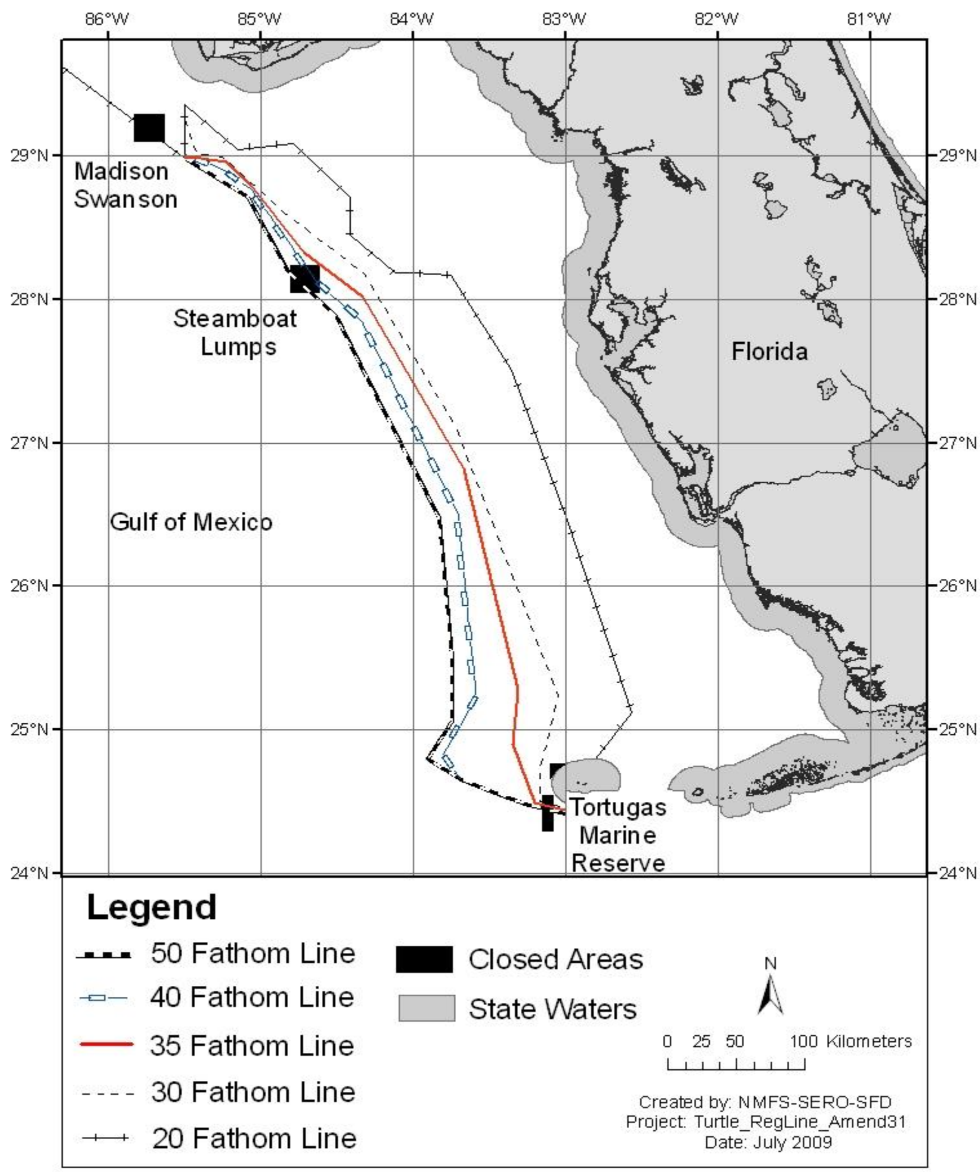

Figure 2.2.2. Proposed fathom regulation lines for area closures in the Gulf reef fish fishery based on depth contours (Alternative 3).

Loggerhead sea turtles spend most of their time in the top three fathoms of water, but may dive to 100 fathoms (Spotila 2004). In waters east of 85°30' W longitude, longlines can only be used seaward of a line approximating the 20-fathom contour (**Alternative 1)**. **Alternative 2 Options a-d** would move this line farther offshore. **Option a** (30 fathoms) would cover the area where 71% of observed sea turtles were captured and **Preferred Option b** (35 fathoms) would cover the area where 76% of observed sea turtles were captured. The average fishing depth for observed SWG sets that captured sea turtles was 28.5 fathoms, as opposed to an average fishing depth of 36.6 fathoms for all observed sets; thus either of these options would prohibit bottom longline gear in the areas where much of the fishing effort and sea turtle takes were observed. Of observed sea turtle takes, 90% were on sets at 40 fathoms or less (**Option c**), and all but one turtle take documented by observers were on sets at 50 fathoms or less (**Option d**). In the western Gulf, longline gear is prohibited in waters inside a line approximating the 50-fathom contour. An aerial survey by the SEFSC (NMFS 2009b; Garrison 2009) recorded sightings of turtles on the west Florida shelf. Of the sea turtles observed in depths greater than 20 fathoms, the concentrations of sea turtles were less in depths greater than 60 fathoms in winter and in depths greater than 40 fathoms in summer (Figure 6.2.2.2).

Closed areas may not reduce sea turtle takes if effort shifts to other areas where sea turtles are found. Migratory tracks show loggerhead sea turtles moving along shore, usually in depths less than 50 fathoms, along the entire west coast of Florida (FWC letter to Crabtree, December 9, 2008; see Appendix A). Some migratory tracks also show loggerhead sea turtles in much deeper water while traversing the Gulf. However, 89% of foraging destinations of female loggerhead sea turtles tracked during Mote Marine Laboratory research were in depths of 50 fathoms or less (A.D. Tucker, Mote Marine Laboratory unpublished data, see Appendix B). Therefore, if fishing effort shifts to deeper water, sea turtle interactions with longline gear could be reduced, although not eliminated.

Under **Alternative 4**, seasonal closures could occur when sea turtles are most likely to be captured. The entire eastern Gulf could be closed during a seasonal closure or just a portion of the fishing area, such as described above for area and depth closures. In the observer records, 76% of sea turtle takes occurred from June through August (**Preferred Option a**) and 95% occurred from April through August (**Option b**; NMFS-SEFSC 2009). In other studies, sighting rates of hardshell sea turtles increased during spring and summer (Fritts et al. 1983; Lohoefener et al. 1988; Braun-McNeill and Epperly 2002). In addition, 53% of sea turtle strandings in the eastern Gulf from 1998 to 2004 occurred during April-August (Sea Turtle Stranding and Salvage Network 2008). However, a MARFIN grant project examining bycatch by the longline component of the reef fish fishery from January-May 2006 captured three loggerhead turtles during January and February (NMFS 2006). Although seasonal closures may reduce effort during certain months, an increase in effort during the open fishing months could result in limited or no reduction in sea turtle takes.

Combinations of the alternatives and options may result in a reasonable reduction of sea turtle takes (Table 2.2.2). The most restrictive combination would close areas in depths of 50 fathoms or less for the entire eastern Gulf year round. Only one sea turtle was taken seaward of 50 fathoms (NMFS-SEFSC 2009). The least restrictive alternative would be No Action (**Alternative 1**).

Table 2.2.2. Number of sea turtle takes recorded by NMFS observers during 2006-2008, within specific depth contours (see Figure 2.2.1). The (#) represents the number of observed sets within the contours. Season*Latitude combines the seasonal takes with the latitudinal areas.

	Depth contour (fathoms)						
	≤20	**20-30**	**30-35**	**35-40**	**40-50**	**>50**	**All depths**
Season							
June - August	1 (15)	11 (115)	1 (15)	3 (23)	0 (9)	0 (6)	16 (183)
April - August	1 (18)	14 (250)	1 (15)	3 (36)	0 (13)	1 (63)	20 (395)
All year	1 (21)	14 (465)	1 (52)	3 (125)	1 (45)	1 (175)	21 (883)
Latitude (Degrees N)							
27-28	0 (17)	10 (190)	1 (24)	0 (23)	1 (20)	0 (28)	12 (302)
26-28	0 (20)	11 (285)	1 (27)	1 (25)	1 (34)	1 (121)	15 (512)
All areas	1 (21)	14 (465)	1 (52)	3 (125)	1 (45)	1 (175)	21 (883)
Season*Latitude (Degrees N) June - August							
27-28	0 (11)	8 (51)	1 (5)	0 (4)	0 (5)	0 (6)	9 (82)
26-28	0 (13)	9 (69)	1 (6)	1 (5)	0 (8)	0 (6)	11 (107)
April - August							
27-28	0 (14)	10 (125)	1 (5)	0 (4)	0 (5)	0 (7)	11 (160)
26-28	0 (16)	11 (182)	1 (6)	1 (5)	0 (10)	1 (42)	14 (261)

Source: Reef Fish Observer Program database, Southeast Fisheries Science Center

The level of takes that would result in a determination of no jeopardy by the longline component of the reef fish fishery to hardshell sea turtle populations is unknown. The 2005 BiOp calculated the anticipated incidental take of hardshell sea turtles for consecutive three-year periods beginning August 2004 (Table 1.1.1), and determined the level was not likely to jeopardize the continued existence of hardshell sea turtles (see Section 1.1 for details). However, no maximum levels were determined. It is possible that takes could be higher without reaching jeopardy status, but how much higher is not clear. The annual average take estimate extrapolated from all three observer datasets (NMFS-SEFSC 2009) is 387 hardshell sea turtles; whereas, the annual number calculated from the 2005 BiOp estimate is 38 hardshell sea turtles (NMFS 2005). Based on these estimates, takes would need to be reduced by 90% to reach the 2005 BiOp level. The least restrictive combination of options in this action that corresponds to this level of observed sea turtle takes is to close the entire eastern Gulf in waters less than 40 fathoms during April-August (**Alternative 2 Option c**, **Alternative 3 Option c**, and **Alternative 4 Option b**).

The Council's combination of **Preferred Alternatives** (**Alternative 2 Option c**, **Alternative 3 Option b**, and **Alternative 4 Option a**) to close areas with depths of 35 fathoms or less for the entire eastern Gulf during June-August would encompass the time and area where 62% of sea turtle takes were observed. The same area closure of depths less than 35 fathoms for the entire eastern Gulf but during April-August would encompass the time and area where 76% of sea turtle takes were observed. Additional examples would encompass lower, but still substantial, proportions of observed sea turtle takes. For example, an area closure of depths less than 40 fathoms between 26^{o} and 28^{o} N latitude during June-August would encompass the area where 52% of the sea turtle takes were observed. An area closure from the 50-fathom line shoreward between 26^{o} and 28^{o} N latitude year round would cover the area where 67% of sea turtles were observed. However, effort shift would likely prevent these percentages of observed sea turtle takes from translating directly into decreases in sea turtle takes under each closure regime.

To account for effort shift, calculations of percent reductions in effective effort (relative to the 2007-2008) can be used as an estimate of potential sea turtle bycatch reduction. Effective effort is the number of hooks as reduced by scalar reduction in sea turtle bycatch rate following redistribution of effort from 20-35 fathoms to deeper water during seasonal closures (NMFS 2009c). Give a closure of eastern Gulf waters less than 35 fathoms during June-August, if all effort shifts to deeper water during the closure, effective effort would be reduced 14% (7-17%, 95% CI); if 50% of effort shifts to deeper water, effective effort would be reduced 16% (13-18%, 95% CI).

Impacts of these alternatives on the physical and biological environments will depend on the level fishing effort is reduced. Lower levels of fishing effort will result in reduced gear interaction with the bottom. Anchors or weights on bottom longlines can impact and damage the bottom habitat. In addition, lines can drag across the surface for considerable distances during retrieval and dislodge lightweight organisms such as invertebrates (Barnette 2001). Longlines can cause physical damage if entangled in coral reefs or with other benthic invertebrates.

Reduced effort would decrease direct fishing mortality of target species as well as discard mortality of non-target species and undersized target species. In 2005-2007, red grouper dominated the commercial longline SWG landings by weight (78% GW; NMFS 2009a). Longline landings make up 71% of the total commercial red grouper landings and have an estimated red grouper release mortality of 45% versus 10% for vertical lines (SEDAR 12 2007). Thus reductions in longline effort could reduce both directed fishing mortality and release mortality even if vertical line fishing were to increase.

In general, more severe restrictions on the longline fleet, e.g., a longer seasonal prohibition on the use of the gear or a wider area within which the gear is restricted, are expected to yield greater reductions in interactions between longline gear and sea turtles and would result in greater effort loss and net operating revenue (NOR) deficits. Under **Alternative 1** (status quo) changes in economic performance are not expected to occur. Levels of interactions between sea turtles and longline gear and associated sea turtle takes are expected to remain high. Furthermore, a delay in the implementation of measures reducing interactions between sea turtles and longline gear could lead to more restrictive management measures at a later date, resulting in greater adverse economic impacts at that time.

Alternative 2 could result in longline effort losses ranging from 411 to 1,238 longline trips under **Options a** and **c**, respectively. Corresponding NOR deficits are estimated to range from $2.9 million to $8.6 million under **Options a** and **c**, respectively. Under **Alternative 3**, longline effort lost and deficits in NOR would range from 619 and 905 longline trips and $3.9 million and $6.1 million, respectively. **Option d** would result in a loss of longline effort estimated at 1,039 trips. If longline effort losses are not converted into vertical line trips, losses in NOR are expected to total $7.1 million, approximately. With a conversion of the totality of lost longline effort into vertical line trips, expected NOR shortfalls under **Option a** are estimated at $1.4 million, approximately. Losses in longline effort and NOR under **Alternative 4** are estimated to vary between 349 and 1,238 longline trips and between $2.1 million and $8.6 million, respectively. For **Alternatives 2-4**, reported losses in NOR could be reduced if lost longline trips are converted into vertical line fishing effort. Gear conversion expenditures are expected to benefit the appropriate suppliers and installers, but would represent a substantial new cost to the longline industry.

Overall, preferred alternatives and options selected by the Council would prohibit the use of longline gear in the eastern Gulf (**Alternative 2 – Preferred Option c**) in waters less than 35 fathoms deep (**Alternative 3 – Preferred Option b**) between June and August (**Alternative 4 – Preferred Option a**). This set of preferred alternatives and options is expected to result in the loss of 243 longline trips. Without loss mitigation through gear conversion, corresponding deficits in NOR are expected to be $1.36 million. Gear conversion to reduce these losses could generate between 109 to 545 vertical line trips with 20% and 100% gear conversion rates, respectively, and the appropriate reductions in NOR are expected to be approximately $1.2 million and $500,000.

In addition to the reductions in NOR anticipated under these alternatives, projected reductions in trips would also be expected to result in additional reductions in economic activity associated with trip costs. Not only would NOR be reduced, which represent captain and crew wages and owner profits, but all operating costs for fuel, bait, ice, food, trip-related gear costs, etc., would not be spent, adversely affecting associated industries. Expenditure flows are expected to partially recover as the rate of gear conversion increases. The aggregate net economic effect of these reductions could be substantial. Employment at multiple levels in the economy could be affected, worsening an already difficult situation due to the current general economic decline. Although the duration of the prohibition could be limited, the severity of the possible disruptions could have long term implications as some affected entities, including fishing vessels/businesses and infrastructure businesses, and participants in all other fisheries or gear sectors that deal with these businesses, may not be able to economically survive.

2.3. Action 3: Longline Endorsements[4] to fish east of Cape San Blas

Alternative 1 – (No Action) Do not establish a longline endorsement to the commercial reef fish permit

Alternative 2 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps* or longline gear of 20,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings

Option a: during the 1999-2004 period
Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Sub-option (ii): unrestricted between commercial reef fish permit holders;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Alternative 3 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps* or longline gear of 30,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings

Option a: during the 1999-2004 period
Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Sub-option (ii): unrestricted between commercial reef fish permit holders;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Preferred Alternative 4 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps* or longline gear of 40,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings

Option a: during the 1999-2004 period
Preferred Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Preferred Sub-option (ii): unrestricted between commercial reef fish permit holders;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Alternative 5 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps***** or longline gear of 50,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings

Option a: during the 1999-2004 period
Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Sub-option (ii): unrestricted between commercial reef fish permit holders;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Alternative 6 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps***** or longline gear of 60,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings

Option a: during the 1999-2004 period
Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Sub-option (ii): unrestricted between commercial reef fish permit holders;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Alternative 7 - Establish a longline endorsement to the reef fish permit to allow sustained participation of fishing communities where the ex-vessel value of red grouper landings accounts for at least 15% of the total ex-vessel value of all species landed in the community. Reef fish permits reporting landings at these communities for at least 5 years during the period of 1999-2007, with a minimum annual average reef fish landings using fish traps***** or longline gear of 30,000 pounds (gutted weight) per permit, will qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings.

Option a: during the 1999-2004 period
Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited

Sub-option (ii): unrestricted between commercial reef fish permit holders at the same community of landings;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length at the same community of landings

Note: To be eligible for a longline endorsement, the permit to which qualifying reef fish landings are attached must be valid or renewable (within the one year grace period immediately following expiration) when the endorsements are issued. For endorsement eligibility, only legal landings reported in compliance with applicable state and federal regulations will be accepted. For endorsement eligibility purposes, permit stacking provisions included in Reef fish Amendment 29 would not apply.

(*) To determine a permit's eligibility for a longline endorsement, reef fish landings using fish traps are considered only if the permit also recorded reef fish landings using longline gear after February 7, 2007.

Discussion and Rationale

The Council chose to use the years 1999 through 2007 to encompass the most recent data available at the time the amendment was developed, thus providing a more robust data set from which to evaluate historical participation in the fishery. The 1999-2004 time period was also considered, as it mimicked the time frame used to establish substantial participation and share allocation for the grouper-tilefish IFQ program established in Reef fish Amendment 29. However, using the 2004 date as a cut-off, which reflects the control date for the fishery, did not provide the Council with the most recent information regarding participation in the fishery. The rationale for beginning the time series in 1999, as recommended by the Council's Reef Fish Advisory Panel (AP), for the IFQ program is quoted from Amendment 29 below:

> The Council chose to use 1999 as the start year in determining catch histories based on guidance from the AP. The AP consists of commercial fishermen and dealers who have been active in the grouper fishery, who have investments and dependence on the fishery, and who are representatives of fishing communities. The AP considered using 1999 as the first year for catch histories because this is a fair, equitable, and accurate representation of who has investments and dependence upon the fishery (both current and historical). Prior to 1999, a series of management measures were implemented that may have caused fishermen who were not as dependent on the fishery to exit. Including years prior to 1999 may not be an accurate representation of current levels of participation. Statistical comparison of permit holder share distributions for 1999-2004 and 1995-2004 revealed no significant differences, indicating eligible IFQ participants would receive similar amounts of shares regardless of the historical time period chosen (source: August 9, 2008, letter to Roy Crabtree from Tom McIlwain).

This action considers various requirements to qualify for a longline endorsement[3] to the commercial reef fish permit. In conjunction with other management actions included in this amendment, the establishment of a gear endorsement program would reduce the number of participants using longline gear in the reef fish fishery and thus, could contribute to the reduction of interactions between longline gear and hardshell sea turtles. In addition, a longline gear endorsement would provide needed information on projected participation in the longline component of the reef fish fishery.

Alternative 1 would not establish a longline endorsement to the reef fish permit. Therefore, **Alternative 1** is not expected to affect the number of reef fish permit holders that would use longline gear to prosecute reef fish. As such, under the no action alternative (**Alternative 1**), interactions between hardshell sea turtles and longline gear would remain at current levels.

Remaining alternatives considered under this action specify eligibility criteria for longline endorsements to fish in the eastern Gulf. Criteria for longline endorsement eligibility are expressed as minimum average annual reef fish landings using fish traps or longline gear based on different time periods. Additionally, conditions under which longline endorsements could be transferred are included in remaining alternatives.

Alternative 2 would establish a longline endorsement to the reef fish permit. A minimum annual average reef fish landings using fish traps or longline gear of 20,000 pounds per permit during the time period considered will be required to qualify for a longline endorsement. Under **Option a** and **Preferred Option b,** annual averages would be computed for the 1999-2004 and 1999-2007 time periods, respectively.

Alternative 3 would grant a longline endorsement to the reef fish permit to any fisherman with a valid or renewable reef fish permit with a minimum annual average reef fish landings using fish traps or longline gear of 30,000 pounds per permit during the period considered. As in **Alternative 2**, annual averages would be computed for the 1999-2004 **(Option a)** and 1999-2007 **(Preferred Option b)** time periods.

Preferred Alternative 4 would grant a longline endorsement to the reef fish permit to any fisherman with a valid or renewable reef fish permit with minimum annual average reef fish landings using fish traps or longline gear of 40,000 pounds per permit. Under **Preferred Option b,** annual average landings will be based on logbook landings during the 1999-2007 time period.

Alternatives 5 and **6** would require higher annual average reef fish landings using fish traps or longline gear to qualify for an endorsement. **Alternatives 5** and **6** would require 50,000 pounds and 60,000 pounds, respectively. Annual averages would also be

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[3] Throughout this amendment, a longline endorsement refers to an endorsement to the reef fish permit, authorizing a vessel to fish in the eastern Gulf of Mexico, i.e., east of Cape San Blas, using longline gear.

computed for the 1999-2004 **(Option a)** and 1999-2007 **(Preferred Option b)** time periods.

In addition to a minimum annual average reef fish landings requirement, **Alternative 7** considers a community-based eligibility requirement to allow sustained participation of fishing communities that rely on the longline component of the reef fish fishery. A fishing community reliant on the longline component is defined as a community where the ex-vessel values of red grouper landings average at least 15% of the total ex-vessel value of all species landed in the community during the 1999-2007 period. Reef fish permits reporting landings at these communities for at least 5 years during the period of 1999-2007, with a minimum annual average reef fish landings using fish traps or longline gear of 30,000 pounds per permit, will qualify for a longline endorsement.

Distributions of the amount of landings and the number of trips, sets, and hooks for commercial reef fish permitted vessels that would qualify for a longline endorsement for alternative minimum landings thresholds for the 1999-2007 and 1999-2004 time periods are provided in Tables 2.3.1 and 2.3.2, respectively. It follows that greater minimum average landings thresholds for endorsement eligibility would leave fewer participants using longline gear in the fishery, potentially resulting in reduced fishing effort and greater reduction of interactions between hardshell sea turtles and bottom longline gear.

Alternative 2 would result in 117 and 118 longline endorsements for 1999-2007 and 1999-2004, respectively. For the 1999-2007 time period, qualifying permits would represent 39.4% of permits landing reef fish using fish traps or longline gear and account for 85.9% of the reef fish landings. It is expected that a reduction in the number of participants using longline gear in the fishery would result in reductions in the number of interactions between hardshell sea turtles and bottom longline gear. The reductions in interactions may potentially be limited by possible effort increases by longline operators who qualified for an endorsement. However, in January 2010 the Gulf grouper-tilefish IFQ program will be implemented and it is unclear what consequences this program will have upon effort as it impacts sea turtle bycatch. It is also expected that some of the longline operators who would not qualify for an endorsement would convert to vertical line gear to continue to participate in the reef fish fishery.

Alternative 3 would further limit the number of participants using longline gear in the reef fish fishery in the eastern Gulf; potentially resulting in greater reduction of interactions between hardshell sea turtles and bottom longline gear. Under **Option b**, i.e., the 1999-2007 time period, **Alternative 3** would reduce the number of participants using longline gear in the reef fish fishery in the eastern Gulf to 82. Qualifying permits would account for 72.1% of longline reef fish landings and 71.3% of the effort (measured in longline sets) in the eastern Gulf.

Table 2.3.1. Number of reef fish permits qualifying for various longline endorsement landings amounts and corresponding changes in effort (trips, sets, and hooks), based on 1999-2007 average fish traps and longline reef fish landings and effort data.

Qualifying Landings	Qualifying Permits	Landings (lbs.)	Percent Total Landings	Trips	Percent Total LL Trips	Sets	Percent Total LL Sets	Hooks (millions)	Percent Total LL Hooks
>0	297	6,383,167	100.0%	1,825	100.0%	35,247	100.0%	38.4	100.0%
10,000	152	6,007,311	94.1%	1,575	86.3%	32,889	93.3%	36.4	95.0%
20,000	117	5,481,462	85.9%	1,349	73.9%	29,930	84.9%	33.9	88.2%
30,000	82	4,599,572	72.1%	1,084	59.4%	25,137	71.3%	28.6	74.5%
40,000	61	3,861,462	60.5%	849	46.5%	20,356	57.8%	23.4	60.9%
50,000	39	2,866,701	44.9%	619	33.9%	14,896	42.3%	17.4	45.3%
60,000	22	1,919,171	30.1%	372	20.4%	8,572	24.3%	10.3	26.8%
70,000	16	1,538,809	24.1%	287	15.7%	6,278	17.8%	7.8	20.3%
80,000	9	1,005,157	15.7%	183	10.0%	4,013	11.4%	5.4	14.0%
90,000	5	668,864	10.5%	121	6.6%	2,491	7.1%	3.3	8.6%

Table 2.3.2. Number of reef fish permits qualifying for various longline endorsement landings amounts and corresponding changes in effort (trips, sets, and hooks), based on 1999-2004 average fish traps and longline reef fish landings and effort data.

Qualifying Landings	Qualifying Permits	Landings (lbs.)	Percent Total Landings	Trips	Percent Total LL Trips	Sets	Percent Total LL Sets	Hooks (millions)	Percent Total LL Hooks
>0	281	6,797,362	100.0%	1,875	100.0%	38,533	100.0%	41.3	100.0%
10,000	155	6,429,311	94.6%	1,604	85.5%	36,142	93.8%	39.5	95.7%
20,000	118	5,830,815	85.8%	1,395	74.4%	32,774	85.1%	36.3	88.0%
30,000	88	5,044,751	74.2%	1,145	61.1%	28,653	74.4%	32.6	78.9%
40,000	66	4,274,800	62.9%	928	49.5%	23,820	61.8%	27.3	66.0%
50,000	45	3,316,169	48.8%	665	35.5%	17,300	44.9%	20.9	50.6%
60,000	31	2,544,918	37.4%	488	26.0%	12,391	32.2%	15.2	36.8%
70,000	17	1,638,116	24.1%	300	16.0%	7,102	18.4%	8.5	20.6%
80,000	13	1,338,400	19.7%	244	13.0%	5,708	14.8%	6.8	16.4%
90,000	5	674,724	9.9%	116	6.2%	2,892	7.5%	3.6	8.8%

Preferred Alternative 4 – Preferred Option b would limit the number of participants using longline gear in the fishery in the eastern Gulf to 61 permits and reduce longline trips by 54%, approximately. Effort reductions expected from the implementation of **Preferred Alternative 4 – Preferred Option b** would be expected to result in greater reduction of the interactions between hardshell sea turtles and bottom longline gear while preserving 60.5% of the reef fish landings using fish traps or longline gear. Incentives for remaining longline operators to increase effort may be less of a consideration under **Preferred Alternative 4 – Preferred Option b** due the limited number of operators that would remain under the required minimum landings threshold set in this alternative. The limited number of longline operators that would remain may also suggest a greater likelihood for gear conversion from longline to vertical line. The NMFS (2009c) cumulative effects analysis determined the **Preferred Alternatives** in **Action 3** alone could reduce effective effort in the bottom longline fishery between 18-37% and therefore hardshell sea turtle interactions with gear.

Alternative 5 would drop the number of qualifying permits to 39 and 45 for 1999-2007 and 1999-2004, respectively, representing 44.9% and 48.8% of the reef fish landings, respectively. By granting longline endorsements to only about 13% of the permit with reef fish landings using fish traps or longline gear, **Alternative 5** would be expected to result in substantial reductions in interaction between hardshell sea turtles and longline gear. However, associated decreases in participation and projected effort reductions may raise concerns relative to the viability of the longline component and associated shore-side businesses.

Alternative 6 would result in 22 and 31 qualifying permits for 1999-2007 and 1999-2004, respectively. Under **Option b**, i.e., the 1999-2007 time period, qualifying permits would account for 30.1% of reef fish landings and 24.3% of the effort (measured in longline sets) in the eastern Gulf.

Alternative 7 would result in 44 and 36 qualifying permits for 1999-2007 and 1999-2004, respectively. Table 2.3.3 provides the number of qualifying permits by fishing community. By comparison, **Alternative 3**, which would also require 30,000 pounds minimum annual average reef fish landings would grant an endorsement to 82 permits for the 1999-2007 period.

Table 2.3.3. Number of qualifying permits by fishing community – based on Alternative 7 (for the 1999-2007 period). Qualifying permits are associated with the last community where they reported landings.

Community	Qualifying Permits
Bokeelia	0
Cortez	7
Gulfport	0
Madeira Beach	34
Redington Shores	2
St Petersburg	0
Tarpon Springs	1
Treasure Island	0
Total	**44**

The community-based criterion requiring that red grouper landings account for at least 15% of the total ex-vessel value of all species landed in the community could be lowered to 12% to include fishing communities of interest such as Apalachicola. An evaluation of the relative magnitude of red grouper ex-vessel values in 2007 indicates that lowering the community threshold to 12% would grant endorsements to 46 permits. The distribution of these permits by community is provided in Table 2.3.4.

Table 2.3.4. Number of qualifying permits by fishing community; based on a 12% community-based threshold for 2007. Qualifying permits are associated with the last community where they reported landings.

Community	Qualifying Permits
Apalachicola	6
Bokeelia	0
Cortez	7
Gulfport	0
Madeira Beach	31
Redington Shores	2
St Petersburg	0
Tarpon Springs	0
Total	**46**

Based on the number of endorsements that would be granted under **Alternative 7**, reductions in interaction between hardshell sea turtles and longline gear are expected to be between reductions anticipated from **Alternative 5** and **Preferred Alternative 4**.

This management action (**Action 3**) also considers conditions under which longline endorsements could be transferred. **Sub-option (i)** would prohibit the transfer of longline endorsements. **Preferred Sub-option (ii)** would allow the transfer of longline endorsements between commercial reef fish permit holders. **Under Sub-option (iii),** a longline endorsement to fish in the eastern Gulf would only be transferable to a vessel of equal or lesser length. For qualifying and non-qualifying permits under **Preferred Alternative 4 – Preferred Option b**, permit distributions by vessel length are illustrated in Figure 2.3.1.

Figure (2.3.1) suggests that the relative frequency distributions by vessel length (ft.) for qualifying and non-qualifying permits are comparable. Frequency distributions for qualifying and non-qualifying permits are approximately bell-shaped with a limited number of smaller vessels (less or equal to 35 ft) and larger vessels (over 50 ft.). Although scenarios under which a larger longline vessel could acquire an endorsement from a smaller vessel and increase effort in the longline component of the reef fish fishery in the eastern Gulf are possible, potential effort increases due to endorsement transfers appear to be limited given the relative frequency distributions by vessel length (ft) for qualifying and non-qualifying permits.

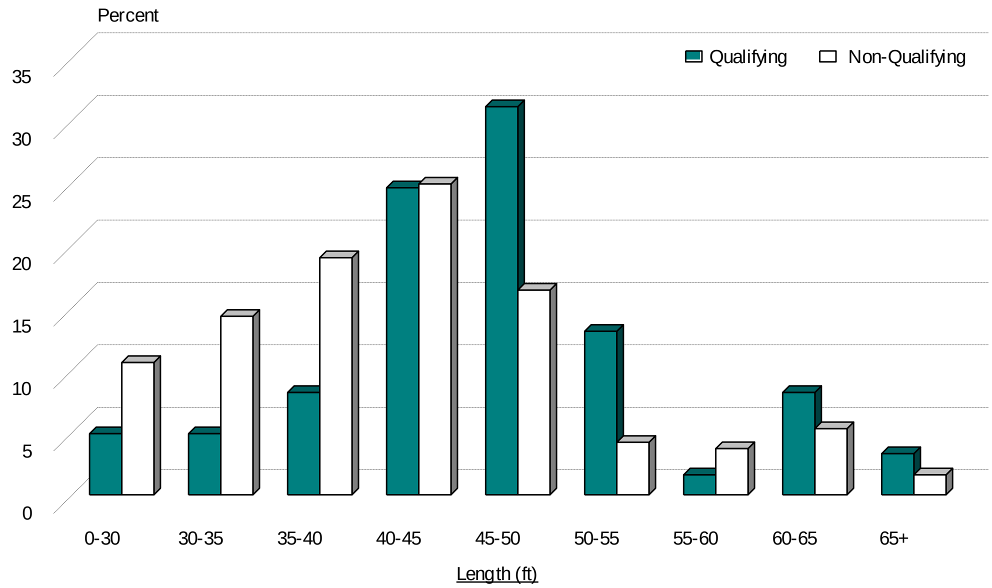

Figure 2.3.1. Relative frequency distributions – qualifying and non-qualifying permits by vessel length; (Minimum annual average reef fish landings using fish traps or longline gear of 40,000 pounds per permit during the 1999-2007 period). Source: NMFS 2009a.

Smaller vessels account for approximately 10% and 25% of the qualifying and non-qualifying vessels, respectively. Larger vessels account for 26% and 15% of the qualifying and non-qualifying vessels, respectively. Additionally, the limited number of endorsements that would be expected to be granted under **Preferred Alternative 4 – Preferred Option b** (61 endorsements) and the future implementation of a grouper and tilefish IFQ program in the Gulf are anticipated to limit longline effort in the fishery. Thus, the implementation of **Sub-option (i),** which would prohibit the transfer of longline endorsements, is not expected to substantially further reduce interactions between hardshell sea turtles and longline gear in the short term in the eastern Gulf. However, for individual operators and fleet owners who wish to transfer an endorsement to another vessel, a transfer prohibition may result in adverse economic impacts as it would limit the operational options available. **Preferred Sub-option (ii)** would allow unrestricted transfer between commercial reef fish permit holders and would not be expected to result in adverse economic impacts on the longline fleet. Based on the composition and size distribution of the existing longline fleet, with relatively few of the larger vessels in the fleet not expected to meet the qualifying criteria, the implementation of **Sub-option ii** would not be expected to result in substantial increases in longline effort in the eastern Gulf. **Sub-option (iii)** which would limit the transfer of an endorsement to commercial reef fish permit holders with a vessel of equal or lesser size (i.e., length in ft.) and, as a result, would not be expected to result in an increase in longline effort nor further reduce interactions between hardshell sea turtles and bottom longline gear. However, under **Sub-option (iii),** the longline fleet may suffer additional adverse economic impacts.

To be eligible to receive a longline endorsement to fish in the eastern Gulf, a person would need to possess an active or renewable (within the one year grace period immediately following expiration) Gulf reef fish commercial vessel permit. The calculation of landings would be based on the average annual reef fish landings using fish traps or longline gear associated with each permit during the applicable landings period. All landings associated with an active or renewable Gulf reef fish commercial vessel permit for the applicable landings period would be attributed to the current owner, including landings reported by a person who held the permit prior to the current owner. Only legal landings reported in compliance with applicable state and federal regulations would be accepted. The NMFS would automatically mail endorsements to all eligible permit holders.

The appeals process included in this amendment provides a formalized process for resolving disputes regarding eligibility for a longline endorsement to fish in the eastern Gulf. In the past, the Council has implemented a number of limited access programs and other similar regulatory actions in a number of fisheries, which have included an appeals process for eligibility determinations, e.g., Amendments 26 and 29 to the Reef Fish FMP. In each of these instances, the Council has utilized a virtually identical process. Because the process has been quite consistent and has worked well in different circumstances, the Council determined that the same process should be used relative to longline endorsements without extensive consideration of other options for appeals. Thus, the process described in this section mirrors previously approved appeals processes. Items subject to appeal include the accuracy of the amount of reef fish landings using longline gear or fish traps, the correct assignment of landings to the permit owner, and the initial eligibility for an eastern Gulf reef fish bottom longline endorsement based on ownership of a qualifying reef fish permit. Appeals must contain documentation supporting the basis for the appeal and must be submitted to the RA postmarked no later than 90 days after the effective date of the final rule that would implement Amendment 31. Appeals based on hardship factors will not be considered. The RA will review, evaluate, and render final decision on appeals. The RA will determine the outcome of appeals based on NMFS' logbooks. Appellants must submit NMFS' logbooks to support their appeal. Landings data for appeals would be based on NMFS' logbooks submitted to and received by the SEFSC by December 31, 2008, for the years 1999 through 2007. If NMFS' logbooks are not available, the RA may use state landings records. In addition, NMFS' records of Gulf commercial reef fish permits constitute the sole basis for determining ownership of such permits. A person who believes he/she meets the permit eligibility criteria based on ownership of a vessel under a different name, as may have occurred when ownership has changed from individual to corporate or vice versa, must document his/her continuity of ownership.

The Council does not consider the endorsement requirement proposed in this action to create an additional limited access system within the existing limited access system for the commercial sector of the Gulf Reef Fish Fishery. A reef fish permit is currently required to commercially harvest species in the reef fish fishery, regardless of the gear used. Subsequent to the implementation of the endorsement requirement, all permit holders will still be entitled to participate in the fishery. The only additional restriction relative to continued participation in the reef fish fishery will be the type of gear participants will be authorized to use.

However, it is possible that some might view the endorsement as creating a separate limited access system within the commercial sector of the reef fish fishery. Section 303(b)(6) establishes the authority for imposing such systems, but it also establishes additional analytical requirements. Specifically, 303(b)(6) contains the following language:

establish a limited access system for the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account—

(A) present participation in the fishery;

(B) historical fishing practices in, and dependence on, the fishery;

(C) the economics of the fishery;

(D) the capability of fishing vessels used in the fishery to engage in other fisheries;

(E) the cultural and social framework relevant to the fishery and any affected fishing communities;

(F) the fair and equitable distribution of access privileges in the fishery; and

(G) any other relevant considerations.

Initially, the limited access system needs to be established in order to achieve OY. In this case, the bottom longline component of the Gulf reef fish fishery has exceeded the authorized incidental take of hardshell sea turtles for the entire fishery, and existing levels of observer coverage have revealed a much higher level of interaction than was previously thought to exist. If some action is not taken to limit takes by bottom longline gear, it is likely that ESA requirements will dictate more restrictive action for the long term, including closing the fishery. Should such severe long term management measures be implemented, they would likely prevent the reef fish fishery from being able to harvest OY for numerous species targeted in the fishery. Therefore, the Council is seeking to take action that will reduce hardshell sea turtle interactions in the fishery, while still providing viable means for harvesting OY in the fishery.

Preferred alternatives selected for the endorsement program reflect the Council's careful consideration of provisions specified under section 303(b)(6). The preferred qualifying years, i.e., 1999-2007, account for the historical practices and present participation in the fishery by including recent reef fish landings and covering a 9-year span. Preferred minimum average landings selected for endorsement eligibility (40,000 pounds per year per permit) would allow those longline fishermen who consistently depend on the fishery to qualify for an endorsement and is expected to mainly exclude operators with limited or sporadic participation in the longline component of the reef fish fishery. In addition, the Council would ensure a fair and equitable distribution of longline endorsements to fish in the eastern Gulf by basing eligibility criteria on logbook records; all commercial reef fish permit holders are required to submit logbooks. While the endorsement program would prevent non-qualifying vessels from using longline gear in the eastern Gulf, these vessels will continue to have the opportunity to participate in the reef fish fishery by converting to another gear type, e.g., vertical line gear, or by fishing in other areas of the Gulf. The Council also considered the social framework and economics of the fishery by selecting a minimum landings threshold for endorsement eligibility that could maintain a profitable longline component and continue to support shore-side businesses, associated infrastructure, and fishing communities dependent on the component in the eastern Gulf.

Alternative 1, the status quo, would not establish a longline endorsement to the reef fish permit. While not creating a longline endorsement would allow all current longline vessels to continue to operate in the fishery and not result in any short term adverse economic effects on these participants, this action, in tandem with other measures considered, may be insufficient to adequately reduce hardshell sea turtle interactions, resulting in more severe management changes, with associated adverse economic effects, than those currently considered. **Alternatives 2-6**, under both **Options a** and **b**, would be expected to result in reductions in total annual net operating revenues for vessels in the bottom longline component of the reef fish fishery. These losses would be expected to be reduced as the rate of gear conversion from longline gear to vertical line gear increases for vessels that would not qualify for an endorsement. For all endorsement thresholds and gear conversion assumptions, the expected reduction in total annual net operating revenues increases if the qualifying years are 1999-2004 compared to 1999-2007; the longer the qualifying period, the lower the total adverse economic affect on the longline sector. Finally, higher minimum annual average landings thresholds are associated with greater expected adverse economic effects on the fishery. While **Alternatives 2** and **3** would be expected to result in lower adverse economic effects on fishery participants than the preferred alternative, these alternatives may not support sufficient reductions in interactions between hardshell sea turtles and bottom longline gear. **Preferred Alternative 4 – Preferred Option b** may strike a balance between reducing interactions between hardshell sea turtles and bottom longline gear and providing opportunities to maintain a bottom longline component that would continue to support shore-side businesses and associated infrastructure dependent on the gear in the eastern Gulf. The composition and size distribution of the existing longline fleet and the limited number of endorsements expected to be issued under the preferred alternative suggest that prohibiting the transfer (**Sub-Option (i)**) of longline endorsements or limiting transfers to vessels of equal or lesser length (**Sub-Option (iii)**) would not be expected to reduce interactions between hardshell sea turtles and bottom longline gear beyond levels expected under the preferred alternative. However, **Sub-options (i)** or **(iii)** could result in adverse economic impacts by impeding the development or proper functioning of a market for endorsements. In contrast, **Preferred Sub-option (ii)** is not expected to result in adverse economic impacts because it would allow unrestricted endorsement transfers. **Alternatives 5** and **6** would significantly curtail longline effort and interactions between hardshell sea turtles and bottom longline gear in the eastern Gulf but the higher landings threshold required to qualify for an endorsement to fish in the eastern Gulf may result in a fleet size that is too limited to sustain shore-side businesses and associated infrastructure dependent on the gear in the eastern Gulf. **Alternative 7** could reduce longline effort and interactions between hardshell sea turtles and bottom longline gear almost as much as **Alternative 5** but its implementation may not grant sustained benefits to targeted communities. **Alternative 7** may also raise fairness and equity issues by excluding permit owners who meet the landings requirement but do not live in one of the targeted fishing communities.

2.4 Action 4: Modify Fishing Practices and Gear for Vessels using Bottom Longline Gear to Harvest Reef Fish east of Cape San Blas

Alternative 1 - No Action - Allow current fishing practices and gear throughout the eastern Gulf.

Alternative 2 - Limit mainline length
Option a: 1 nautical mile[4]
Option b: 2 nautical miles
Option c: 4 nautical miles
Option d: 5 nautical miles

Preferred Alternative 3 – Limit the number of hooks for vessels that have a longline endorsement to their reef fish permit.

Option a: 500 hooks
Prefered Option b: 1,000 hooks of which no more than 750 hooks are rigged for fishing or fished.
Option c: 1,500 hooks

(*) rigged for fishing is defined as: hooks attached to a line or other device capable of attaching to the mainline of the longline

Alternative 4 - Limit gangion length
Option a: 2 feet (ft.)
Option b: 4 feet
Option c: 6 feet

<u>Discussion and Rationale</u>

Alternative 1 would allow current fishing practices and gear in the eastern Gulf bottom longline component of the reef fish fishery to remain the same.

Alternative 2 limits mainline length (nautical miles) in the bottom longline component of the reef fish fishery. Based on 2006-2008 observer data this alternative could reduce hardshell sea turtle interactions with bottom longline gear. The reef fish bottom longline industry uses a range of mainline lengths, which typically depend on fishing vessel size. For example, the average mainline length calculated from 2005-2008 logbook data targeting SWG ranged from 6 to 7 nautical miles (NMFS 2009a). Observers in the RFOP recorded the same average mainline length of 6 nautical miles (NMFS 2009a). Using observer data sets, the mean mainline length with hardshell sea turtle takes was significantly longer than the mean mainline length without hardshell sea turtle takes. The average mainline length for sets with and without sea turtle takes were estimated at 6.7 and 5.3 nautical miles, respectively ($t_{\text{unequal variances}} = 2.7$, $p < 0.05$ two tailed)[5]. An unequal variances t-test was used to quantify the data, described by Ruxton (2006) as the best test for quantifying data with large differences in sample size.

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[4] 1 nautical mile is equal to 1.1508 statute miles

[5] The Council noted there was a low sample size (n=12 sets) when a sea turtle take was recorded versus (n = 635 sets) when sea turtle takes were not recorded in the RFOP. This a large difference is sample size and should be

Option a limits mainline length to 1 nautical mile, **Option b** limits mainline length to 2 nautical miles. **Option a** or **b** would be a considerable change to the fishing practices currently used in the bottom longline component of the reef fish fishery. **Option c** limits mainline length to 4 nautical miles and is the longest mainline length, documented by observers without a recorded hardshell sea turtle take (Figure 2.4.1). However, this shorter mainline length is infrequently used throughout the bottom longline sector and was rarely documented by observers. Bottom longline fishers in the industry suggest limiting mainline length to 5 nautical miles (**Option d)**. Five nautical miles of mainline was frequently documented by observers in the RFOP, but is also less than the average length recorded in logbooks or by observers. Based on relative percent frequency, observers recorded hardshell sea turtles takes with 5 nautical miles as frequently as 7 nautical miles of mainline (Figure 2.4.2). Therefore, little data exists to support that limiting the mainline length to 5 nautical miles as a gear restriction could adequately reduce hardshell sea turtle interactions with longline gear.

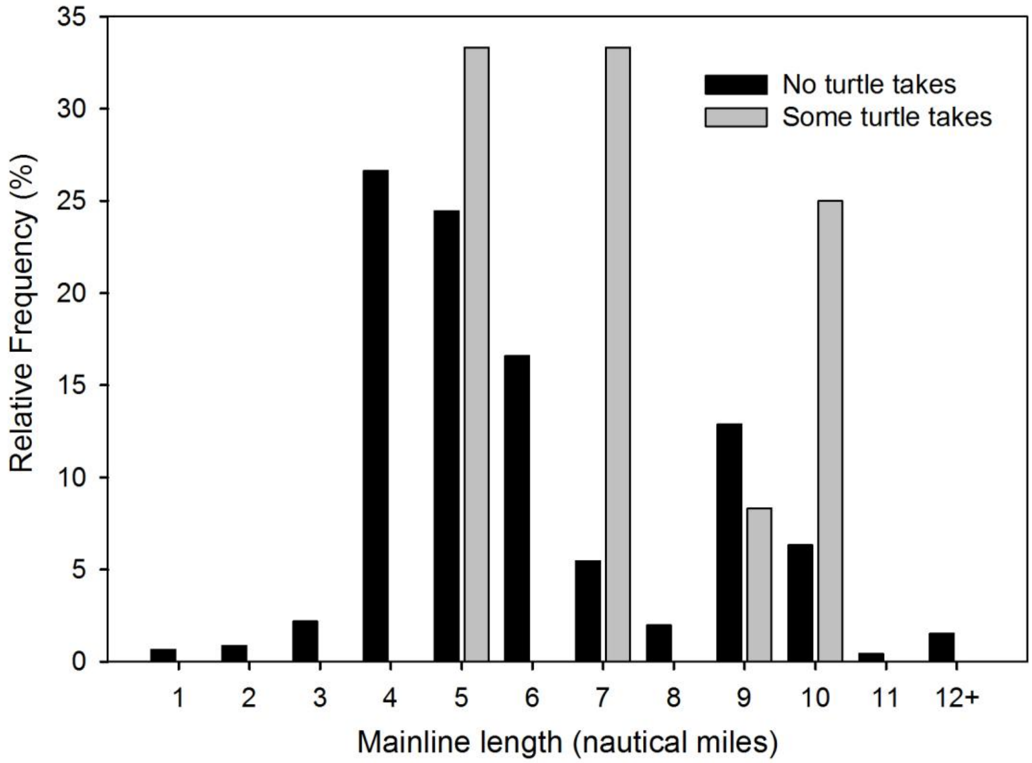

Figure 2.4.1. Relative frequency (%) distribution for mainline length (nautical miles) calculated from 2006 through 2008 Reef Fish Observer Program (RFOP). Black bars are sets when observers recorded no hardshell sea turtle takes (n=635) and gray bars are when observers recorded some hardshell sea turtle takes (n=12), *n=sample size in sets (Source: NMFS 2009a).

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approached with caution when using this statistic alone for broad assumptions made to the whole eastern Gulf bottom longline component of the reef fish fishery.

Preferred Alternative 3 limits the number of hooks allowed onboard and hooks being fished for vessels that possess a longline endorsement to the reef fish. Logbooks and observer programs do not record the number of hooks per vessel, but instead record the number of hooks per set. For the purposes of this alternative, it is assumed that the average number of hooks per set is fairly consistent due to pre-cut length of mainline spooled on a drum. Bottom longline fishers can change the placement of hooks on the mainline and therefore the number of hooks, but generally the number of hooks remains consistent. From the enforcement perspective the number of hooks per vessel is considered an easier gear restriction for law enforcement officials to check than a previously considered alternative of hooks per mile, moved to Appendix C-Considered, But Rejected.

Based on 2006-2008 observer data this alternative could reduce hardshell sea turtle interactions with bottom longline gear. Limiting the number of hooks could allow operations to run more quickly by reducing the time spent retrieving the mainline, dehooking catch, and dehooking bycatch. Quicker haul back of the mainline due to the limited number of hooks per vessel could also result in reduced soak time, increasing the probability of a hardshell sea turtle surviving if incidentally hooked. Observers documented the greatest number of hardshell sea turtle takes when 750 or more hooks per set were used. Using observer data sets with hardshell sea turtle takes, the mean number of hooks per set was significantly higher than the mean for sets without hardshell sea turtle takes. The mean number of hooks per set with and without hardshell sea turtles were estimated at 1,558 and 1,012 hooks respectively ($t_{\text{unequal variances}} = 2.2$, $p < 0.05$ two tailed)[5]. Any limit in the number of hooks per vessel may reduce the number of hardshell sea turtles incidentally hooked as well as the targeted catch (Figure 2.4.2). **Option a** limits the number of hooks to 500 per vessel. This is the lowest number of hooks per vessel of all the options. Based on logbook and observer data there are some bottom longline fishers that use 500 hooks per set, but the percent frequency throughout the fishery is low. **Preferred Option b** limits the number of hooks per vessel to 1,000 of which no more than 750 hooks are fished or rigged for fishing. Observers did record hardshell sea turtle interactions when fishers used 750 hooks per set; however, the reduced number of hooks could allow operations to run more quickly and result in reduced soak times. This could reduce the probability of a hardshell sea turtle drowning if an interaction with bottom long gear did occur. The NMFS (2009c) analyses found **Preferred Alternative 3** alone could result in a baseline reduction in effort between 27-39%, depending on assumptions about effort shifts and effort compensation. **Option c** limits the number of hooks per vessel to 1,500. Observers did not record hardshell sea turtles interactions with gear as frequently when 1,000 versus 1,500 hooks per set or greater were used. The Council selected A**lternative 3** as a preferred option based on the 27-39% reduction in effort, which when combined (the amounts are not additive because of interactions) with approximately a 15% reduction in effort from **Action 2** and a 18-37% reduction in effort from **Action 3** yielded an overall reduction in effective effort of 48% to 67%. This met the Council's goal of meeting recommended reductions in effort, which is assumed to reflect similar reductions in turtle interactions, and is discussed more fully in Section 6.4.2.

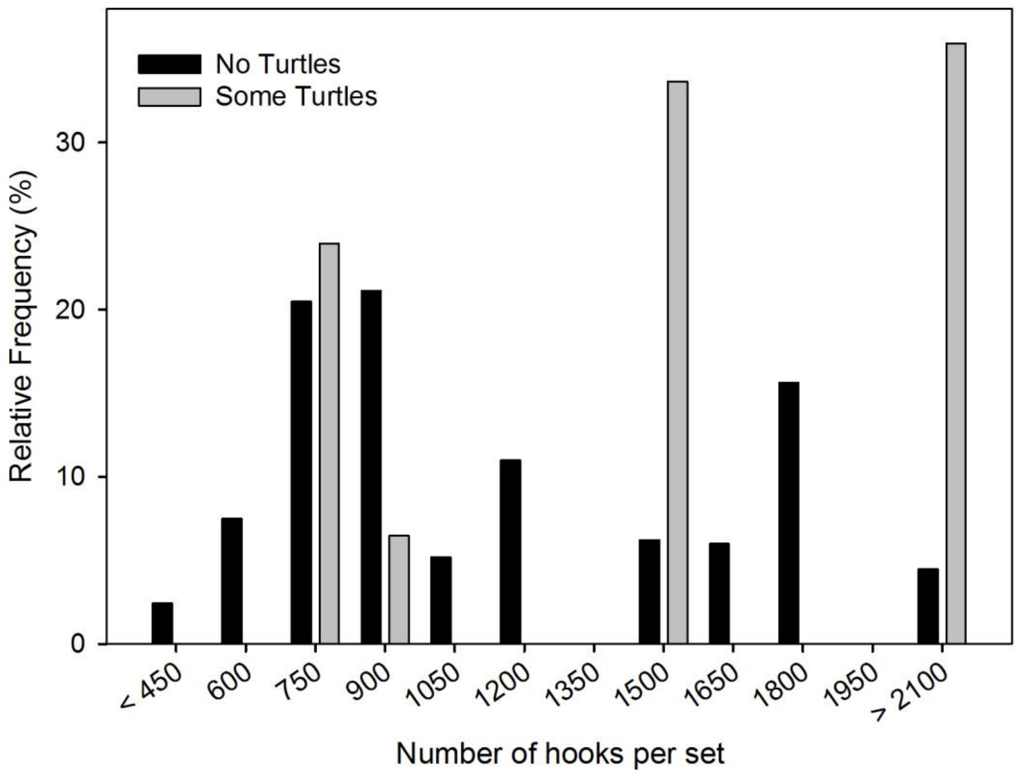

Figure 2.4.2. Relative frequency (%) distribution for hooks per set calculated from 2006 through 2008 RFOP. Black bars are sets when observers recorded no hardshell sea turtle takes (n=635) and gray bars are when observers recorded some hardshell sea turtle takes (n=12), *n=sample size in sets (Source: NMFS 2009a).

Alternative 4 limits gangion length (i.e., leader length) in the bottom longline component of the reef fish fishery. Anecdotal reports from bottom longline reef fish fishermen suggest that hardshell sea turtles were not as frequently hooked with gear until longer (i.e., 6 to 10 ft.) gangions were used. Observers recorded some hardshell sea turtle takes on all gangion lengths (Figure 2.4.3). Using observer data no significant differences in mean gangion length were detected with and without hardshell sea turtle takes, estimated at 6.3 and 5.2 ft., respectively ($t_{unequal\ variances} = 1.1$, $p > 0.05$ two tailed)[5]. Observers recorded a greater frequency of no sea turtle takes using 4 ft. gangions versus 6, 8, and 10 foot gangions (Figure 2.4.3). However, the percentage of the fishery that uses 4 ft. gangions is low compared to 6, 8 and 10 ft. using all recorded observer data (Figure 2.4.4). Further research is needed to determine if there is a significant correlation in gangion length and sea turtle takes. Gangion length is not available from logbooks because it is not a required entry.

Option a limits gangion length to 2 ft., which is below the average length recorded in the reef fish fishery from the observer program. **Option b** limits gangion length to 4 ft., which is within range of what was documented in the NMFS (2009a) report and is used by approximately 13% of the fishery, but not as frequently as the 6 and 8 ft. gangions (Figure 2.4.4). **Option c** limits gangion length to 6 ft. which is presently used by 28% of the fishery (Figure 2.4.4).

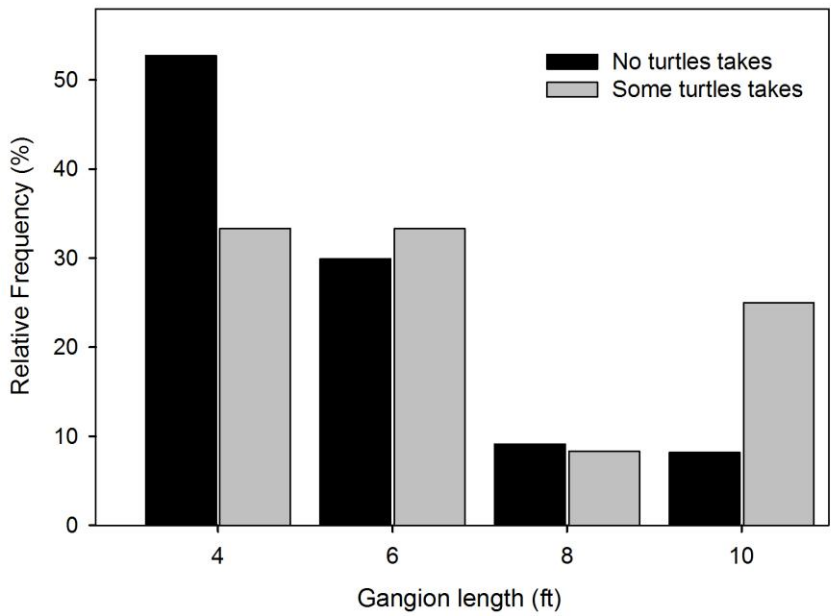

Figure 2.4.3. Relative frequency (%) distribution for gangion length (ft.) calculated from 2006 through 2008 RFOP. Black bars are sets when observers recorded no hardshell sea turtle takes (n=635) and gray bars are when observers recorded some hardshell sea turtle takes (n=12), *n=sample size in sets (Source: NMFS 2009a).

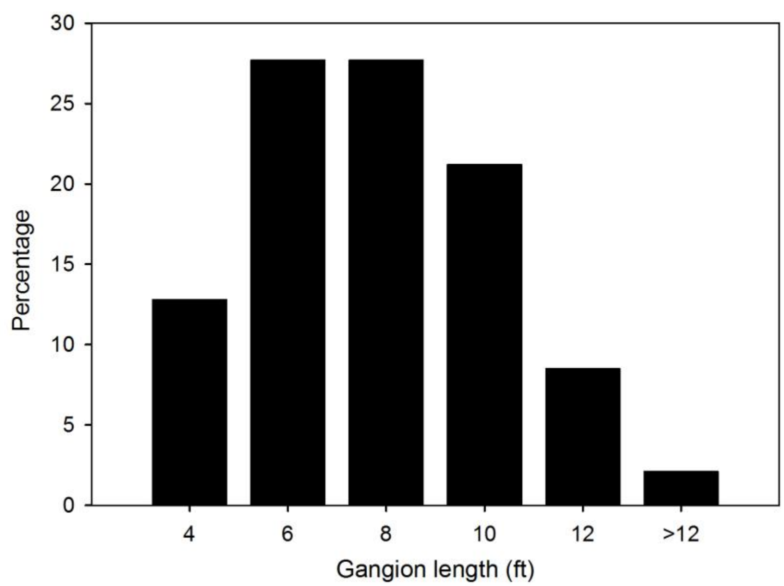

Figure 2.4.4. Percentage of gangion lengths used in all observer trips for the reef observer program from the January 2006-May 2008 (SEFSC correspondence addressed to R. Crabtree, December 23, 2008).

Action 4 considers a series of restrictions on fishing practices and gear in the reef fish fishery to reduce interactions between hardshell sea turtles and bottom longline reef fish gear with the exception of the no action **Alternative 1**. Physical and biological impacts to the environment will depend on the reduction in fishing effort from **Alternatives 2 - 4**. Reductions in fishing effort by gear restrictions, such as mainline length, number of hooks per vessel, and gangion length could reduce gear interactions with the substrate. For example, shorter mainline lengths would likely reduce soak times which could reduce the impact and damage to the benthic substrate. In addition, a reduction in the number of hooks (**Preferred Alternative 3**) and shorter gangion lengths (**Alternative 4**) could also reduce the probability of gear becoming entangled in benthic organisms such soft corals and sponges, causing damage or mortality. Reduced effort by gear limitation could also reduce directed fishing mortality as well as bycatch mortality. Limiting the number of hooks per vessel could allow landing of targeted species to become quicker, potentially reducing the morality of non-targeted bycatch by reducing soak time. Most of the options in **Action 4** would restrict fishing practices and gear usage. For example, a vessel in Madeira Beach, Florida typically uses 8 to 9 nautical miles of mainline per set, with 2,000 hooks (R. Spaeth, personal communication). **Alternatives 2** and **4** would set maximum allowable mainline and gangion lengths, respectively. **Preferred Alternative 3** limits the number of hooks per vessel that are fished or rigged for fishing. Reductions in the number of interactions between hardshell sea turtle takes and bottom longline gear are expected; however, the net economic effects on fishing vessels cannot be determined with available data. It seems probable that vessels might compensate for a hook reduction by increasing the number of sets, or make other fishing changes, diminishing the potential adverse effects of these restrictions on net operating revenues, thereby partially offsetting expected reduction in hardshell sea turtle interactions. Others have argued that effort is unlikely to be increase due to daily trip limitations on vessels even with hooks per vessel limitations.

Administrative effects would be greatest for law enforcement. Gear limitations are difficult to monitor, measure, and enforce at sea. However, out of the other alternatives in **Action 4** hook limitation, **Preferred Alternative 3** was discussed as the easier restriction to monitor. Many of the other alternatives to gear could be monitored at the dock while catch is being landed or during routine vessel checks by the USCG.

3.0 AFFECTED PHYSICAL, BIOLOGICAL, AND ECONOMIC ENVIRONMENTS

3.1 Description of Affected Physical Environment

The physical environment for reef fish has been described in detail in the EIS for the Generic EFH Amendment and is incorporated here by reference (GMFMC 2004a). The Gulf has a total area of approximately 600,000 square miles (1.5 million km^2), including state waters (Gore 1992). It 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. Oceanic conditions are primarily affected by the Loop Current, the discharge of freshwater into the Northern Gulf, and a semi-permanent, anticyclonic gyre in the western Gulf. Gulf water temperatures range from 12º C to 29º C (54º F to 84º F) depending on time of year and depth of water.

Environmental Sites of Special Interest Relevant to Grouper Species (Figure 3.1.1)

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).

Madison/Swanson and Steamboat Lumps Marine Reserves - No-take marine reserves sited on gag spawning aggregation areas where all fishing except for surface trolling during May through October is prohibited (219 square nautical miles).

Tortugas North and South Marine Reserves - No-take marine reserves cooperatively implemented by the state of Florida, NOAA's National Ocean Service (NOS), the Council, and the National Park Service (see jurisdiction on chart) (185 square nautical miles). In addition, Generic Amendment 3 for addressing EFH requirements, Habitat Areas of Particular Concern (HAPC), and adverse effects of fishing prohibited the use of anchors in these HAPCs in the following FMPs of the Gulf: Shrimp, Red Drum, Reef Fish, Stone Crab, Coral and Coral Reefs in the Gulf, and Spiny Lobster and the Coastal Migratory Pelagic resources of the Gulf and South Atlantic (GMFMC 1991; GMFMC 2005a).

Individual reef areas and bank HAPCs of the northwestern Gulf containing pristine coral areas are protected by preventing use of some fishing gear that interacts with the bottom. These areas are: East and West Flower Garden Banks, Stetson Bank, Sonnier Bank, MacNeil Bank, 29 Fathom, Rankin Bright Bank, Geyer Bank, McGrail Bank, Bouma Bank, Rezak Sidner Bank, Alderice Bank, and Jakkula Bank (263.2 square nautical miles). Some of these areas were made marine sanctuaries by NOS and these marine sanctuaries are currently being revised. Bottom anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots on coral reefs are prohibited in the East and West Flower Garden Banks, McGrail Bank, and on the significant coral resources on Stetson Bank.

Florida Middle Grounds HAPC - Pristine soft coral area protected from use of any fishing gear interfacing with bottom (348 square nautical miles).

Pulley Ridge HAPC - A portion of the HAPC where deepwater hermatypic coral reefs are found is closed to anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots (2,300 square nautical miles).

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

Alabama SMZ - In the Alabama SMZ, fishing by a vessel operating as a charter vessel or headboat, a vessel that does not have a commercial permit for Gulf reef fish, or a vessel with such a permit fishing for Gulf reef fish, is limited to hook-and-line gear with no more than three hooks. Nonconforming gear is restricted to bag limits, or for reef fish without a bag limit, to 5% by weight of all fish aboard.

Additionally, Generic Amendment 3 for addressing EFH requirements (GMFMC 2005a) requires a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf EEZ. A weak link is defined as a length or section of the tickler chain that has a breaking strength less than the chain itself and is easily seen as such when visually inspected. Also, the amendment establishes an education program on the protection of coral reefs when using various fishing gears in coral reef areas for recreational and commercial fishermen.

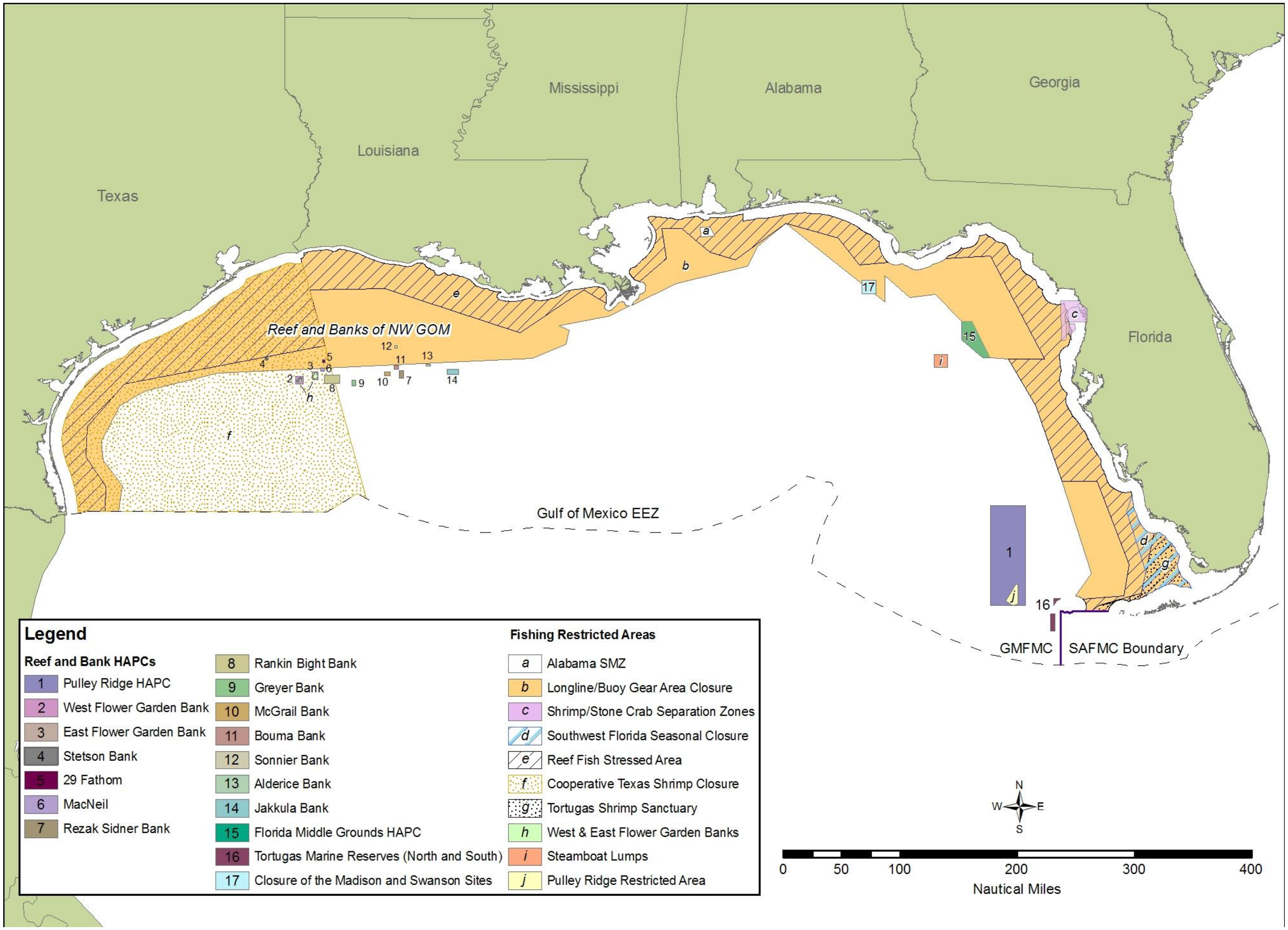

Figure 3.1.1. Map of most fishery management closed areas in the Gulf

3.2 Description of Affected Biological Environment

The biological environment of the Gulf, including the species addressed in this amendment, is described in detail in the final EIS for the Generic EFH amendment and is incorporated here by reference (GMFMC 2004a).

3.2.1 Reef Fish

General Information on Reef Fish Species

The NOS collaborated with NMFS and the Council to develop distributions of reef fish (and other species) in the Gulf (SEA 1998). The NOS obtained fishery-independent data sets for the Gulf, including SEAMAP, and state trawl surveys. Data from the Estuarine Living Marine Resources (ELMR) Program contain information on the relative abundance of specific species (highly abundant, abundant, common, rare, not found, and no data) for a series of estuaries, by five life stages (adult, spawning, egg, larvae, and juvenile) and month for five seasonal salinity zones ((0-0.5, 0.5-5, 5-15, 15-25, and >25 parts per thousand (ppt)). NOS staff analyzed the data to determine relative abundance of the mapped species by estuary, salinity zone, and month. For some species not in the ELMR database, distribution was classified as only observed or not observed for adult, juvenile, and spawning stages.

In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. Habitat types and life history stages are summarized in Table 3.2.1 and can be found in more detail in GMFMC (2004b). In general, both eggs and larval stages are planktonic. Larvae feed on zooplankton and phytoplankton. Exceptions to these generalizations include gray triggerfish which lay their eggs in depressions in the sandy bottom, and gray snapper whose larvae are found around submerged aquatic vegetation (SAV). Juvenile and adult reef fish are typically demersal, and are usually associated with bottom topographies on the continental shelf (<100 m) which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. However, several species are found over sand and soft-bottom substrates. Juvenile red snapper are common on mud bottoms in the northern Gulf, particularly off Texas through Alabama (GMFMC 1998). Also, some juvenile snappers (e.g. mutton, gray, red, dog, lane, and yellowtail snappers) and groupers (e.g. goliath grouper, red, gag, and yellowfin groupers) have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC 1981). More detail on hard bottom substrate and coral can be found in the FMP for Corals and Coral Reefs (GMFMC and SAFMC 1982).

Table 3.2.1. Summary of habitat utilization by life history stage for most species in the Reef Fish FMP. This table is adapted from Table 3.2.7 in the final draft of the EIS from the Council's EFH generic amendment (GMFMC 2004a).

Common name	Eggs	Larvae	Post-larvae	Early Juveniles	Late juveniles	Adults	Spawning adults
Red snapper	Pelagic	Pelagic		Hard bottoms, Sand/ shell bottoms, Soft bottoms	Hard bottoms, Sand/ shell bottoms, Soft bottoms	Hard bottoms, Reefs	Sand/ shell bottoms, Reefs
Queen snapper	Pelagic	Pelagic				Hard bottoms	
Mutton snapper	Reefs	Reefs	Reefs	Mangroves, Reefs, SAV, Emergent marshes	Mangroves, Reefs, SAV, Emergent marshes	Reefs, SAV	Shoals/ Banks, Shelf edge/slope
Schoolmaster	Pelagic	Pelagic		Mangroves, SAV	Hard bottoms, Mangroves, Reefs, SAV, Emergent marshes	Hard bottoms, Reefs, SAV	Reefs
Blackfin snapper	Pelagic			Hard bottoms	Hard bottoms	Hard bottoms, Shelf edge/slope	Hard bottoms, Shelf edge/slope
Cubera snapper	Pelagic			Mangroves, Emergent marshes, SAV	Mangroves, Emergent marshes, SAV	Mangroves, Reefs	Reefs
Gray (mangrove) snapper	Pelagic, Reefs	Pelagic, Reefs	SAV	Mangroves, Emergent marshes, Seagrasses	Mangroves, Emergent marshes, SAV	Emergent marshes, Hard bottoms, Reefs, Sand/ shell bottoms, Soft bottoms	
Dog snapper	Pelagic	Pelagic		SAV	Mangroves, SAV	Reefs, SAV	Reefs
Mahogany snapper	Pelagic	Pelagic		Reefs, Sand/ shell bottoms	Reefs, Sand/ shell bottoms	Hard bottoms, Reefs, Sand/ shell bottoms, SAV	
Lane snapper	Pelagic		Reefs, SAV	Mangroves, Reefs, Sand/ shell bottoms, SAV, Soft bottoms	Mangroves, Reefs, Sand/ shell bottoms, SAV, Soft bottoms	Reefs, Sand/ shell bottoms, Shoals/ Banks	Shelf edge/slope
Silk snapper						Shelf edge	
Yellowtail snapper	Pelagic			Mangroves, SAV, Soft bottoms	Reefs	Hard bottoms, Reefs, Shoals/ Banks	
Wenchman	Pelagic	Pelagic				Hard bottoms, Shelf edge/slope	Shelf edge/slope

Common name	Eggs	Larvae	Post-larvae	Early Juveniles	Late juveniles	Adults	Spawning adults
Vermilion snapper	Pelagic			Hard bottoms, Reefs	Hard bottoms, Reefs	Hard bottoms, Reefs	
Gray triggerfish	Reefs	Drift algae	Drift algae	Drift algae	Drift algae, Reefs	Reefs, Sand/ shell bottoms	Reefs, Sand/ shell bottoms
Greater amberjack	Pelagic	Pelagic	Pelagic	Drift algae	Drift algae	Pelagic, Reefs	Pelagic
Lesser amberjack				Drift algae	Drift algae	Hard bottoms	Hard bottoms
Almaco jack	Pelagic			Drift algae	Drift algae	Pelagic	Pelagic
Banded rudderfish		Pelagic		Drift algae	Drift algae	Pelagic	Pelagic
Hogfish				SAV	SAV	Hard bottoms, Reefs	Reefs
Blueline tilefish	Pelagic	Pelagic				Hard bottoms, Sand/ shell bottoms, Shelf edge/slope, Soft bottoms	
Tilefish	Pelagic, Shelf edge/ slope	Pelagic		Hard bottoms, Shelf edge/slope, Soft bottoms	Hard bottoms, Shelf edge/slope, Soft bottoms	Hard bottoms, Shelf edge/slope, Soft bottoms	
Dwarf sand perch					Hard bottoms	Hard bottoms, Soft bottoms	
Sand perch						Reefs, SAV, Shoals/ Banks, Soft bottoms	
Rock hind	Pelagic	Pelagic				Hard bottoms, Reefs	Hard bottoms, Reefs
Speckled hind	Pelagic	Pelagic				Hard bottoms, Reefs	Shelf edge/slope
Yellowedge grouper	Pelagic	Pelagic			Hard bottoms	Hard bottoms	
Red hind	Pelagic	Pelagic		Reefs	Reefs	Hard bottoms, Reefs, Sand/ shell bottoms	Hard bottoms
Goliath grouper	Pelagic	Pelagic	Man-groves	Mangroves, Reefs, SAV	Hard bottoms, Mangroves, Reefs, SAV	Hard bottoms, Shoals/ Banks, Reefs	Reefs, Hard bottoms
Red grouper	Pelagic	Pelagic		Hard bottoms, Reefs, SAV	Hard bottoms, Reefs	Hard bottoms, Reefs	
Misty grouper	Pelagic	Pelagic				Hard bottoms, Shelf edge/slope	Hard bottoms
Warsaw grouper	Pelagic	Pelagic			Reefs	Hard bottoms, Shelf edge/slope	

Common name	Eggs	Larvae	Post-larvae	Early Juveniles	Late juveniles	Adults	Spawning adults
Snowy grouper	Pelagic	Pelagic		Reefs	Reefs	Hard bottoms, Reefs, Shelf edge/slope	
Nassau grouper		Pelagic		Reefs, SAV		Hard bottoms, Reefs, Sand/ shell bottoms	Hard bottoms, Reefs, Sand/ shell bottoms
Black grouper	Pelagic	Pelagic		SAV	Hard bottoms, Reefs	Hard bottoms, Mangroves, Reefs	
Yellowmouth grouper	Pelagic	Pelagic		Mangroves	Mangroves, Reefs	Hard bottoms, Reefs	
Gag	Pelagic	Pelagic		SAV	Hard bottoms, Reefs, SAV	Hard bottoms, Reefs	
Scamp	Pelagic	Pelagic		Hard bottoms, Mangroves, Reefs	Hard bottoms, Mangroves, Reefs	Hard bottoms, Reefs	Reefs, Shelf edge/slope
Yellowfin grouper				SAV	Hard bottoms, SAV	Hard bottoms, Reefs	Hard bottoms

Status of Reef Fish Stocks

The Reef Fish FMP currently encompasses 42 species (Table 3.2.1). Stock assessments have been conducted on 11 species: red snapper (SEDAR 7 2005), vermilion snapper (Porch and Cass-Calay 2001; SEDAR 9 2006a), yellowtail snapper (Muller et al. 2003; SEDAR 3 2003), gray triggerfish (Valle et al. 2001; SEDAR 9 2006b), greater amberjack (Turner et al. 2000; SEDAR 9 2006c), hogfish (Ault et al. 2003; SEDAR 6 2004a), red grouper (NMFS 2002; SEDAR 12 2007; SEDAR 2009a), gag (Turner et al. 2001; SEDAR 10 2006; SEDAR 2009b), yellowedge grouper (Cass-Calay and Bahnick 2002), and goliath grouper (Porch et al. 2003; SEDAR 6 2004b) (Table 3.2.2). A review of the Nassau grouper's stock status was conducted by Eklund (1994), and updated estimates of generation times were developed by Legault and Eklund (1998).

Of the 11 species for which stock assessments have been conducted, the second quarter report of the 2009 Status of U.S. Fisheries (NMFS 2009d) classifies three as overfished (greater amberjack, gray triggerfish, and red snapper), and four as undergoing overfishing (red snapper, gag, gray triggerfish and greater amberjack). However, a recent stock assessment update for gag (SEDAR 2009b) indicates this species is overfished. The recent assessment for vermilion snapper (SEDAR 9 2006a) indicates this species is not overfished or undergoing overfishing. Recent assessments for gray triggerfish and gag (SEDAR 9 2006b and SEDAR 10 2006, respectively) suggest these two species are experiencing overfishing, and stock recovery for greater amberjack is occurring slower than anticipated. Many of the stock assessments and stock assessment reviews can be found on the Council (www.gulfcouncil.org) and SEDAR (www.sefsc.noaa.gov/sedar) Websites.

Table 3.2.2. Species of the reef fish FMP. Species in bold have had stock assessments.

Common Name	Scientific Name	Stock Status
Balistidae--Triggerfishes		
Gray triggerfish	Balistes capriscus	Overfishing, overfished unknown
Carangidae--Jacks		
Greater amberjack	Seriola dumerili	Overfished overfishing
Lesser amberjack	Seriola fasciata	Unknown
Almaco jack	Seriola rivoliana	Unknown
Banded rudderfish	Seriola zonata	Unknown
Labridae--Wrasses		
Hogfish	Lachnolaimus maximus	Unknown
Lutjanidae--Snappers		
Queen snapper	Etelis oculatus	Unknown
Mutton snapper	Lutjanus analis	Unknown
Schoolmaster	Lutjanus apodus	Unknown
Blackfin snapper	Lutjanus buccanella	Unknown
Red snapper	Lutjanus campechanus	Overfished overfishing
Cubera snapper	Lutjanus cyanopterus	Unknown
Gray (mangrove) snapper	Lutjanus griseus	Unknown
Dog snapper	Lutjanus jocu	Unknown
Mahogany snapper	Lutjanus mahogoni	Unknown
Lane snapper	Lutjanus synagris	Unknown
Silk snapper	Lutjanus vivanus	Unknown
Yellowtail snapper	Ocyurus chrysurus	Not overfishing, not overfished
Wenchman	Pristipomoides aquilonaris	Unknown
Vermilion snapper	Rhomboplites aurorubens	Not overfished, not overfishing
Malacanthidae--Tilefishes		
Goldface tilefish	Caulolatilus chrysops	Unknown
Blackline tilefish	Caulolatilus cyanops	Unknown
Anchor tilefish	Caulolatilus intermedius	Unknown
Blueline tilefish	Caulolatilus microps	Unknown
(Golden) Tilefish	Lopholatilus chamaeleonticeps	Unknown
Serranidae--Groupers		
Dwarf sand perch	Diplectrum bivittatum	Unknown
Sand perch	Diplectrum formosum	Unknown
Rock hind	Epinephelus adscensionis	Unknown
Yellowfin grouper	Mycteroperca venenosa	Unknown
Scamp	Mycteroperca phenax	Unknown
Red hind	Epinephelus guttatus	Unknown
Goliath grouper	Epinephelus itajara	Unknown not overfishing
Nassau grouper	Epinephelus striatus	Unknown not overfishing
Red grouper	Epinephelus morio	Not overfished, not overfishing
Gag	Mycteroperca microlepis	Overfishing, overfished unknown
Yellowmouth grouper	Mycteroperca interstitialis	Unknown
Black grouper	Mycteroperca bonaci	Unknown
Yellowedge grouper	Epinephelus flavolimbatus	Unknown
Snowy grouper	Epinephelus niveatus	Unknown
Warsaw grouper	Epinephelus nigritus	Unknown
Misty grouper	Epinephelus mystacinus	Unknown
Speckled hind	Epinephelus drummondhayi	Unknown

3.2.2 Species Protected Under the ESA and MMPA

There are 28 different species of marine mammals that may occur in the Gulf. All 28 species are protected under the Marine Mammal Protection Act (MMPA) and six are also listed as endangered under the ESA (i.e., sperm, sei, fin, blue, humpback and North Atlantic right whales). Other species protected under the ESA occurring in the Gulf include five sea turtle species (Kemp's ridley, loggerhead, green, leatherback, and hawksbill); two fish species (Gulf sturgeon and smalltooth sawfish); and two coral species (elkhorn, *Acropora palmata* and staghorn, *A. cervicornis*). Information on the distribution, biology, and abundance of these protected species in the Gulf are included in the final EIS to the Council's Generic EFH amendment (GMFMC, 2004a), the February 2005 ESA BiOp on the reef fish fishery (NMFS 2005) and the *Acropora* Status Review (*Acropora* Biological Review Team 2005). Marine Mammal Stock Assessment Reports and additional species information is also available on the NMFS Office of Protected Species website: http://www.nmfs.noaa.gov/pr/species/.

The Gulf reef fish fishery is classified in the 2009 MMPA List of Fisheries as Category III fishery (73 FR 73032). This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from the fishery is less than or equal to 1% of the potential biological removal[6]. Dolphins are the only species documented as interacting with this fishery. Bottlenose dolphins may predate and depredate on the bait, catch, and/or released discards of the reef fish fishery.

All five species of sea turtles may be adversely affected by the Gulf reef fish fishery via incidental capture in hook-and-line gear. Incidental captures of sea turtle species occur in all commercial and recreational hook-and-line components of the reef fishery, but recent observer data indicate they are most frequent in the bottom longline component of the reef fish fishery. On an individual set basis, incidental captures may be relatively infrequent, but collectively, these captures sum to a high level of bycatch. Observer data indicate loggerhead sea turtles are the species most affected by the bottom longline component of the reef fish fishery and that is why a more detailed description of this species is included below. Mortality of sea turtles caught is particularly problematic in this fishery component, because many are dead or in poor condition upon retrieval of the gear as a result of forced submergence (i.e., drowning). All sea turtles caught on hook-and-line and released alive may later succumb to injuries sustained at the time of capture or from exacerbated trauma from fishing hooks or lines that were ingested, entangling, or otherwise still attached when they were released. Sea turtle release gear and handling protocols are required to reduce the amount of gear on released animals and minimize post-release mortality.

Smalltooth sawfish are also affected by the Gulf reef fish fishery, but to a much lesser extent than hardshell sea turtles. Smalltooth sawfish primarily occur in the Gulf off peninsular Florida. Although the long, toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in fishing gear, incidental captures in the commercial and recreational hook-and-line components of the reef fish fishery are rare events. Only eight smalltooth sawfish are estimated to be incidentally caught annually, and none are expected to result in mortality (NMFS 2005). Fishermen in this fishery are required to follow smalltooth sawfish safe handling guidelines.

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[6]The potential biological removal is the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population

Loggerhead Sea Turtle

The loggerhead sea turtle was listed as a threatened species throughout its global range on July 28, 1978 (43 FR 32800). It was listed because of direct take, incidental capture in various fisheries, and the alteration and destruction of its habitat.

Loggerhead sea turtles inhabit the temperate and tropical continental shelves and estuarine regions of the Atlantic, Pacific, and Indian Oceans. The majority of loggerhead sea turtle nesting is at the western rims of the Atlantic and Indian Oceans. Within the continental U.S., loggerhead sea turtles nest from Texas to Virginia. Major nesting concentrations in the U.S. are found on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (NMFS 1984). Within the western Atlantic, loggerhead sea turtles also nest in Mexico, the Bahamas, Cuba, and the Greater Caribbean (Addison and Morford 1996; Dodd 1988; Moncada Gavilán 2001; Zurita et al. 2003).

From a global perspective, U.S. nesting aggregations are of paramount importance to the survival of the species as is the population that nests on islands in the Arabian Sea off Oman (Ross 1982; Ehrhart 1989). The loggerhead sea turtle nesting aggregations in Oman and the U.S. account for the majority of nesting worldwide. The most recent reviews show that only two loggerhead sea turtle nesting aggregations have greater than 10,000 females nesting per year (Baldwin et al. 2003; Ehrhart et al. 2003; Kamezaki et al. 2003; Limpus and Limpus 2003; Margaritoulis et al. 2003): South Florida (U.S.) and Masirah (Oman). The status of the Oman nesting colony has not been evaluated recently. Total estimated nesting in the U.S. has fluctuated between 47,000 and 90,000 nests per year over the last decade (FWC, unpublished data; GDNR, unpublished data; SCDNR, unpublished data; NCWRC, I-4 unpublished data). Recent analyses of nesting data from the Index Nesting Beach Survey program in southeast Florida indicate the population is declining. Similarly, analysis of long-term nesting data show loggerhead sea turtle nesting declines in North Carolina, South Carolina, and Georgia

The loggerhead sea turtle is commonly found throughout the North Atlantic including the Gulf, the northern Caribbean, The Bahamas archipelago (Dow et al. 2007), and eastward to West Africa, the western Mediterranean, and the west coast of Europe. Adult loggerhead sea turtles are known to make considerable migrations between foraging areas and nesting beaches (Plotkin and Spotila 2002; Schroeder et al. 2003; Hawkes et al. 2007; Foley et al. in press). During non-nesting years, adult females from U.S. beaches are distributed in waters off the eastern U.S., The Bahamas, Greater Antilles, and Yucatán, and throughout the Gulf. In contrast to determining population size on nesting beaches, determining population size in the marine environment has been localized (Bjorndal and Bolten 2000). At present, there are no data on population size in the oceanic habitat.

Loggerhead sea turtles occupy the following three different ecosystems during their lives the terrestrial zone, oceanic zone[7], and neritic zone.[8] Within the oceanic and neritic ecosystems sea turtles are described as: (1) pelagic, if they occupy the water column, but not the sea floor, in either the neritic zone or oceanic zone, (2) epipelagic if they occupy the upper 200 meters in the

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[7] The oceanic zone includes the vast open ocean environment (from the surface to the sea floor) where water depths are greater than 200 meters.

[8] The neritic zone generally includes the continental shelf, but in areas where the continental shelf is very narrow or nonexistent, the neritic zone conventionally extends to areas where water depths are less than 200 meters.

oceanic zone, or (3) benthic or demersal, if they are on the sea floor in either the neritic zone or oceanic. Life history of loggerhead sea turtle are generally described by five life stages: hatchling, post-hatchling, oceanic juvenile, neritic juvenile, and adult. NMFS and USFWS (2008), Tables 3 and 4, include typical values of life history parameters and reported size distributions, stage durations, annual survival probabilities, and growth rates for loggerhead sea turtles nesting in the U.S.

Loggerhead sea turtles reach sexual maturity at around 35 years of age. In the southeastern U.S., mating occurs in late March to early June and females lay eggs between late April and early September. Loggerhead sea turtles nest on ocean beaches, generally preferring high energy, relatively narrow, steeply sloped, coarse-grained beaches. Females lay three to five nests, and sometimes more, during a single nesting season. The eggs incubate approximately two months before hatching sometime between late June and mid-November.

Immediately after hatchlings emerge from the nest, they begin a period of frenzied activity. During this active period, hatchlings move from their nest to the surf, swim and are swept through the surf zone, and continue swimming away from land for about one to several days.

After this period, post-hatchling loggerhead sea turtles take up residence in areas where surface waters converge to form local downwellings. These areas are often characterized by accumulations of floating material, such as seaweed (e.g., *Sargassum*), and, in the southeast U.S., are common between the Gulf Stream and the southeast U.S. coast, and between the Loop Current and the Gulf Coast of Florida. Post-hatchlings within this habitat are observed to be low-energy float-and-wait foragers that feed on a wide variety of floating items (Witherington 2002). As post-hatchlings, loggerhead sea turtles may linger for months in waters just off the nesting beach or become transported by ocean currents within the Gulf and North Atlantic (Lohmann and Lohmann 1994; 1996; Lohmann et al. 1999) suggests that loggerhead sea turtles may continue some oriented swimming in order to keep from being swept into cold North Atlantic currents.

Once individuals get transported by ocean currents farther offshore, they've entered the oceanic zone. Within the North Atlantic, oceanic juvenile loggerhead sea turtles have been primarily studied in the waters around the Azores and Madeira (Bolten 2003). Other populations exist (e.g., in the region of the Grand Banks off Newfoundland), but data on these populations are limited. The oceanic juvenile loggerhead sea turtles around the Azores and Madeira spend the majority of their time in the top 15 ft (5 m) of the water column.

Somewhere between the ages of 7 to 12 years, oceanic juveniles migrate to nearshore coastal areas (neritic zone) and continue maturing until adulthood. In addition to providing critically important habitat for juveniles, the neritic zone also provides crucial foraging habitat, inter-nesting habitat, and migratory habitat for adult loggerhead sea turtles in the western North Atlantic. To a large extent, these habitats overlap with the juvenile stage, the exception being most of the bays, sounds, and estuaries along the Atlantic and Gulf coasts of the U.S. from Massachusetts to Texas, which are infrequently used by adults. However, adult loggerhead sea turtles are present year-round in Florida Bay, an important feeding area, probably because of relatively easy access to open ocean and migratory routes.

The predominate foraging areas for western North Atlantic adult loggerhead sea turtles are found throughout the relatively shallow continental shelf waters of the U.S., Bahamas, Cuba, and the Yucatán Peninsula, Mexico. Post-nesting females (i.e., during non-nesting years) depart from the nesting beach and typically make directed migrations. Migration routes from foraging habitats to nesting beaches (and vice versa) for a portion of the population are restricted to the continental shelf, while other routes involve crossing oceanic waters to and from the Bahamas, Cuba, and the Yucatán Peninsula. Adult females exhibit strong fidelity to foraging areas and have been observed to return to these sites over the course of many breeding seasons. Seasonal migrations of adult loggerhead sea turtles along the mid- and southeast U.S. coasts have also been documented. For these loggerhead sea turtles, initial post-nesting migration is north, and a second migration is directed south as northern waters cool. Post-nesting loggerhead sea turtles take up residence in discrete foraging areas. Post nesting females may move among a few preferred foraging sites within the larger foraging area. These areas are relatively small in size, on the order of tens of square kilometers, and are located on continental shelves. Foraging area may be located relatively near the nesting beach or thousands of kilometers distant and may be located within a different nation than the nesting beach. Loggerhead sea turtles do not necessarily nest at the nesting beach closest to their home foraging area. Resident foraging areas are widespread, challenging their protection.

3.3 Description of the Economic Environment

3.3.1 Commercial Sector

Introduction

This section provides an overview of the commercial sector of the multi-species reef fish fishery in the Gulf and focuses on the operations of harvesters and dealers. There is some overlap in the commercial and for-hire operations in the sense that some vessels operate as both commercial harvesters and as for-hire operations. The commercial operations of these dual-permitted vessels are included in the description of the commercial sector.

The major sources of data summarized in this description include the Federal Logbook System (FLS) and Accumulated Landings System (ALS), with price indices taken from the Bureau of Labor Statistics. Specialized studies, either as add-ons to existing data collection programs or as periodic surveys, supplement the information from the major data sources. The overview covers 1993 through 2006. Basic data were provided by J. Waters, NMFS-SEFSC, personal communication.

In the following discussion, several species/species groups are presented, namely, reef fish, SWG, DWG, tilefish, red grouper, and gag. The SWG information includes red grouper, gag, and all other SWG, while the reef fish totals include all grouper, tilefish, and all other federally managed reef fish species.

Annual Landings, Ex-vessel Values, and Effort

The commercial reef fish fishing fleet in the Gulf is composed of vessels using different gear types and catching a variety of species. A license limitation program is in place in the reef fish fishery. To harvest commercial quantities of reef fish a vessel requires a valid commercial reef fish permit on board. Commercial reef fish permits are renewable every year, with a grace period of one year to renew a permit. Non-renewal of a permit within this grace period results in permanent loss of that particular permit. On January 16, 2009, there were a total of 994 active and renewable reef fish permits.

For the entire 1993-2006 period, reef fish-permitted vessels landed a total of 257 mp of reef fish valued (ex-vessel) at $562 million in nominal dollars or $642 million in real (adjusted to 2005 dollars) dollars. In addition, these vessels landed another 17 mp of non-reef fish species valued at $18 million in nominal dollars or $21 million in real dollars. The grouper and tilefish fisheries accounted for 52% of all reef fish landings and 56% of reef fish ex-vessel values during this period.

Average annual landings and value estimates are provided in Table 3.3.3.1. Over the 1993-2006 period, these reef fish-permitted vessels landed an annual average of 7.82 mp of SWG, 1.17 mp of DWG, and 0.52 mp of tilefish. The respective ex-vessel values for these harvests were $18.91 million, $3.06 million, and $0.77 million in nominal dollars, or $21.51 million, $3.49 million, and $0.88 million in real dollars (2005 dollars). Within the SWG totals, red grouper and gag dominated the fishery; red grouper accounted for 67% of landings and 62% of ex-vessel values, while gag accounted for 18% of landings and 21% of ex-vessel values.

Average annual landings for all species categories examined rose from the first period (1993-1998) to the next period (1999-2004), but fell in the third period (2005-2006). Landings in the third period, however, remained higher than those in the first period. Red grouper landings increased by approximately 21% from the first to the second period, and declined by approximately 13% in the third period. Gag landings showed a dramatic increase of 122% from the first to the second period and fell by 19% in the third period. Landings of all SWG rose by 31% in the second period and fell by 17% in the third period. DWG landings rose by about 27% in the second period and fell by 21% in the third quarter, bringing the third period's landing of DWG close to those of the first period. Tilefish landings rose by only 5% in the second period and fell by about the same percentage in the third period.

Nominal (current) and real (adjusted for inflation) ex-vessel revenues rose and fell from one period to the next in the same manner as landings, with two exceptions; the nominal ex-vessel values for red grouper and tilefish showed slight increases instead of declines in the third period. In general, however, the second period (1999-2004) registered the highest ex-vessel values for all subject species. Nominal ex-vessel values increased in the second period by 34%, 143%, 47%, 45%, and 17% for red grouper, gag, SWG, DWG, and tilefish, respectively, while the appropriate increases in real value were 16%, 112%, 28%, 26%, and 1%. Decreases in the third period ranged from 7% for tilefish to 21% for DWG.

Table 3.3.1.1. Average annual landings and revenues (ex-vessel value), 1993-2006

Period	Red Grouper	Gag	SWG	DWG	Tilefish	Reef
Landings (1,000 lbs.)						
1993-98	4,790	850	6,840	1,047	507	17,584
1999-04	5,831	1,885	8,946	1,331	534	19,756
2005-06	5,074	1,525	7,389	1,053	510	16,598
1993-06	5,276	1,390	7,821	1,170	519	18,374
Nominal Value ($1,000)						
1993-98	9,854	2,243	15,057	2,488	697	34,097
1999-04	13,223	5,453	22,136	3,604	814	44,895
2005-06	13,360	4,915	20,779	3,150	841	44,252
1993-06	11,799	4,000	18,908	3,061	768	40,176
Real Value ($1,000; 2005 dollars)						
1993-98	12,494	2,814	19,045	3,145	880	43,173
1999-04	14,541	5,959	24,301	3,956	893	49,265
2005-06	13,155	4,868	20,499	3,123	830	43,595
1993-06	13,466	4,455	21,505	3,489	879	45,844

Table 3.3.1.2 contains estimates of the average annual number of boats, trips, and days at sea for vessels harvesting at least one pound of the respective species or species group. The number of boats actively participating in the fishery can be considered one measure of effort in the fishery. For the entire 1993-2006 period, the average annual number of boats that harvested at least one pound of the respective species was 765 for red grouper, 591 for gag, 977 for all SWG, 376 for DWG, 212 for tilefish, and 1,123 for all reef fish. While landings of grouper and tilefish in particular and the reef fish fishery in general have shown patterns of increases and decreases, the number of boats actively participating in the fishery (except for gag) has shown a pattern of decline from 1993-2006. For reef fish as a whole, the average annual number of boats in the fishery declined from a high of 1,246 in the first period (1993-1998) to a low of 895 in the third period (2005-2006). A similar pattern can be observed for the grouper fishery and all its component fisheries, except gag. The average annual number of boats declined from 797 for red grouper, 1,059 for all SWG, 399 for DWG, and 231 for tilefish in the first period to respective lows of 765, 977, 376, and 212 in the third period. Only in the gag fishery did the number of boats rise, increasing from 530 boats in the first period to 655 in the second period, while decreasing to 591 boats in the third period. This increase in the number of boats from the first period to the second could explain the large increase in gag landings in the second period. The decline in the number of boats landing at least one pound of each species or species group in the third period for all the fisheries examined could be due to a variety of factors, including changes in the fish stock and economic conditions, but is beyond the scope of this amendment.

The downward trend in the number of boats landing reef fish is partially reflected in the number of trips taken, but the decline in trips is not as dramatic as the decline in boats (Table 3.3.1.2). Before declining in the third period, except for reef fish and tilefish, the average annual number of trips increased in the second period, which could partially explain the increases in landings in the second period. The average annual number of trips landing at least one pound of the selected species over the entire 1993-2006 period was 6,627, with a range 5,824 to 7,074 for red grouper; 4,825, with a range of 3,884 to 5,820 for gag; 9,860, with a range of 7,764 to 10,405 for all SWG; 2,144, with a range of 1,397 to 2,437 for DWG; 834, with range of 904 to 665 for tilefish; and 14,698, with range of 11,630 to 15,359 for all reef fish.

Days away from port can be considered another indicator of fishing effort in the fishery. This indicator, however, may not exactly reflect the time spent for fishing because of the travel time required to reach and return from the fishing areas. Nevertheless, the general pattern of days away from port over time may provide some broad indications of the trend in fishing days. As seen in Table 3.3.1.2, the changes in the average annual days away from port generally mimic those of the average annual number of trips. The average annual number of days away from port increased in the second period for red grouper, gag, and DWG, and decreased for the other species or species groups. The third period, however, registered declines in days away from port for all species and species groups.

The general conclusion of an examination of these measures of effort is that effort declined for all selected species and species groups over the period 1993 through 2006, with peaks in effort generally occurring in the second period (1999-2004). There are several potential reasons for the decline in effort, such as an increase in fishing cost (particularly fuel cost in recent years), an increase in harvesting efficiency, more restrictive regulations particularly for grouper, and changes in stock status. However, more research is needed to determine the specific contributors to this decline.

Table 3.3.1.2. Average annual number of boats, trips, and days away from port for trips landing at least one pound of selected species, 1993-2006

Period	Red Grouper	Gag	SWG	DWG	Tilefish	Reef
Boats						
1993-98	797	530	1,059	399	231	1,246
1999-04	767	655	958	368	193	1,075
2005-06	666	579	791	330	215	895
1993-06	765	591	977	376	212	1,123
Trips						
1993-98	6,449	3,884	10,013	2,101	904	15,359
1999-04	7,074	5,820	10,405	2,437	820	15,059
2005-06	5,824	4,664	7,764	1,397	665	11,630
1993-06	6,627	4,825	9,860	2,144	834	14,698
Days Away from Port						
1993-98	33,154	17,432	44,079	12,909	6,862	55,204
1999-04	33,363	24,698	43,219	13,875	6,380	52,946
2005-06	28,165	21,543	34,433	8,089	4,598	43,035
1993-06	32,531	21,133	42,333	12,634	6,332	52,498

Seasonal Characteristics

The average annual pattern for monthly landings of reef fish as a whole is rather straightforward: landings increase in February and March, then fall in a steady fashion, except for October, the rest of the year (see Figure 3.3.1.1). The monthly patterns for all SWG and red grouper are about the same, likely due to the dominance of red grouper in total SWG harvests: landings fall from January through March, rise and fall through the next two quarters (April-June and July-September), and remain relatively flat in the last quarter (October-December). Gag landings are show little variability over the course of the entire year, but are higher in January than in any other month. For all groups, there is a perceptible landings increase in October compared to September, though October harvests do not always exceed harvest levels in the summer months. In addition to the regulatory regime, fish stock, market, and harvesting conditions are some of the factors that shape the seasonal characteristics of the reef fish fishery.

For the period 1993-2006, reef fish landings averaged 1.5 million pounds a month and ranged from 1.1 million pounds to 1.8 million pounds. SWG landings averaged 652 thousand pounds and ranged from 520 thousand pounds to 800 thousand pounds. Red grouper landings averaged 440 thousand pounds, with a range of 301 to 572 thousand pounds. The average for gag was 116 thousand pounds, with a range of 73 to 170 thousand pounds.

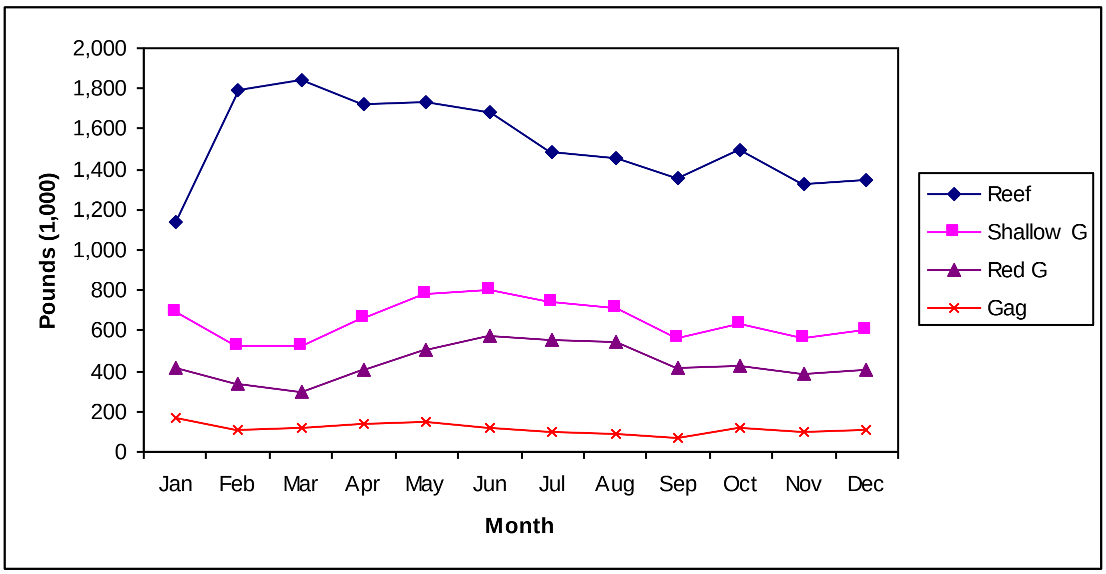

Figure 3.3.1.1. Average monthly landings (thousand pounds) of selected species, 1993-2006

Monthly average real prices (adjusted for inflation) for reef fish, SWG, gag, and red grouper follow a common pattern during the 1993-2006 period (Figure 3.3.1.2). Each reached a peak in March, steadily fell through June, then gradually rose through October, and fell slightly in November and December. Gag commanded the highest prices in all months, followed by shallow-water grouper, and then by red grouper and reef fish. The clear difference in prices for gag and red grouper could indicate certain level of product differentiation between the two species.

As can be expected, although gag is the more highly valued species, the average monthly prices for SWG respond to the dominance of red grouper landings. Lower prices for other reef fish, compared to the prices of the grouper species, also brought down the average prices for all reef fish combined below the average monthly red grouper prices.

The monthly price for gag averaged $3.20 per pound (real dollars) and ranged from $2.96 to $3.49. Red grouper monthly prices averaged $2.58 per pound and ranged from $2.25 to $2.90. For the shallow-water grouper complex, monthly prices averaged at $2.77 per pound and ranged from $2.44 to $3.11. Prices for all reef fish averaged at $2.49 per pound and ranged from $2.23 to $2.76.

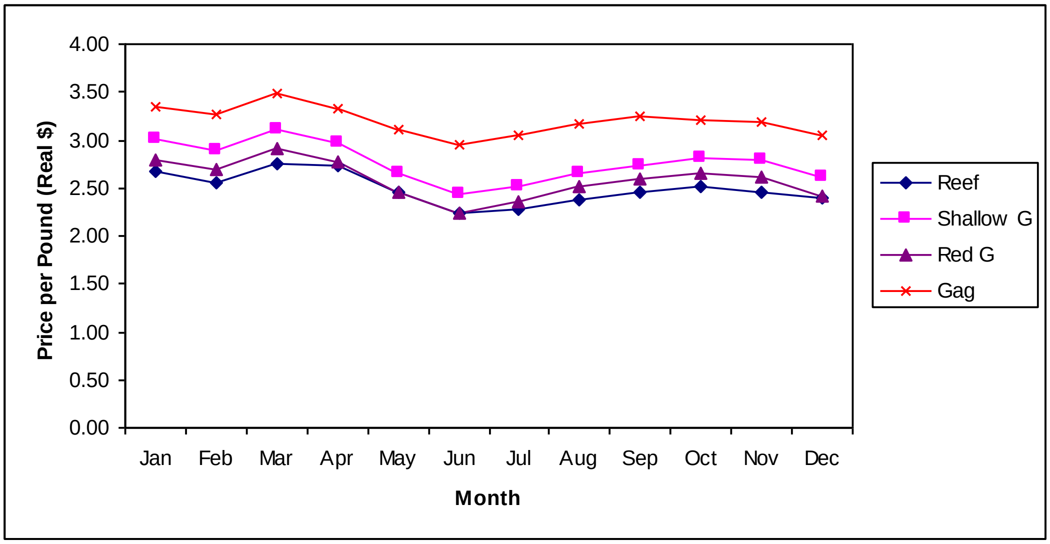

Figure 3.3.1.2. Average monthly price per pound (adjusted for inflation) of selected species, 1993-2006

The average number of trips taken by boats landing at least one pound of reef fish, SWG, red grouper, or gag also followed a seasonal pattern, as shown in Figure 3.3.1.3. The average number of trips for all reef fish species and all SWG generally rose in the first few months, peaking in March for reef fish and May for SWG, then gradually declined through the remainder of the year, with the exception of the October spike. Although red grouper and gag harvests dominate SWG harvests, while the average number of trips by boats landing as least one pound of SWG increases from January through May, the average number of trips for boats landing red grouper or gag actually decline from January to February before increasing through their peak in May. The spawning closure during this period would be expected to be a factor in these declines. Average numbers of trips per month were 1,045 for reef fish, 669 for shallow-water grouper, 440 for red grouper, and 342 for gag.

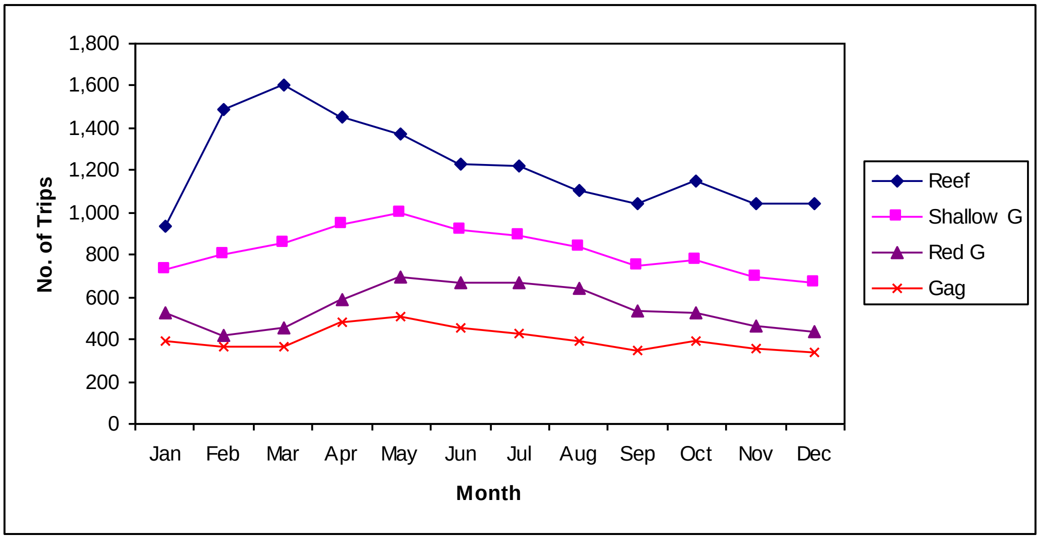

Figure 3.3.1.3. Average monthly trips by boats landing at least one pound of selected species, 1993-2006

Seasonality also characterizes the number of days spent by boats away from port. As illustrated in Figure 3.3.1.4, the average number of days away from port rose for all species groupings in the first few months of the year, peaked in May, and gradually fell through the remainder of the year, except in October, which showed stable effort for red grouper and a slight increase for gag. For gag, red grouper, and SWG, the seasonality in the number of days away from port closely followed that of the average number of trips. For reef fish as a whole, the average number of trips peaked earlier (March) than the number of days away from port (May). The average number of days away from port were 4,375 days, 3,528 days, 2,711 days, and 1,761 days for reef fish, SWG, red grouper, and gag, respectively.

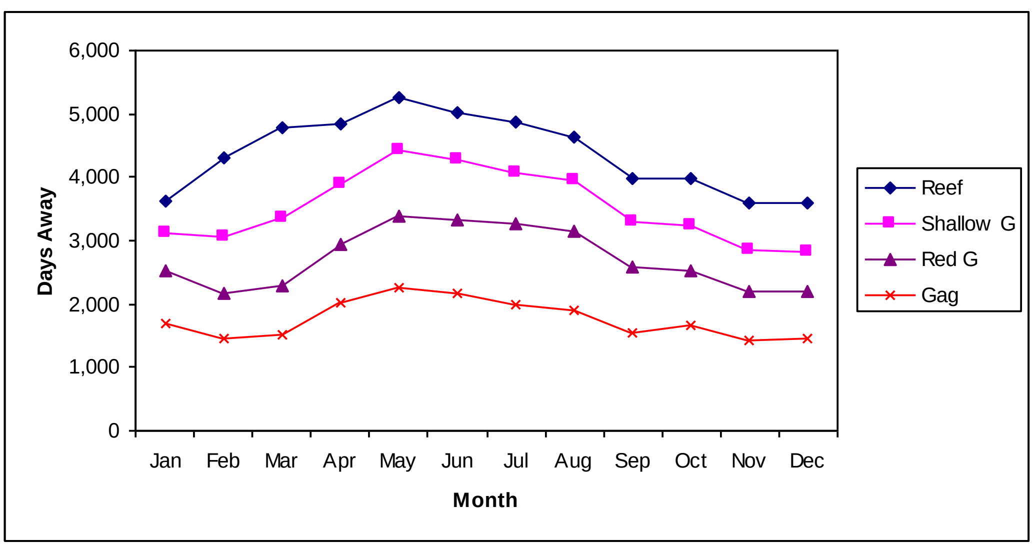

Figure 3.3.1.4. Average days away from port of boats landing at least one pound of selected species, 1993-2006.

Fishery Performance by Gear Type

Various gear types are used in the harvest of reef fish. For grouper and tilefish, vertical/handlines and longlines are the two dominant gear types (see Table 3.3.1.3). Traps were historically the third most important gear type, but have been prohibited for use in the harvest of reef fish since February 2007. How historic landings from traps has and will be distributed among the remaining gear types is unknown at this time.

In terms of landings, longlines have dominated the grouper and tilefish fisheries (Table 3.3.1.3). Handlines have been the dominant gear in the gag fishery. Except for fish traps, all the other gear types accounted for relatively small amounts of grouper and tilefish landings. In addition, trap catches are only significant in the SWG component of the fishery. The distribution of revenues mimics that of landings; longlines generated the most ex-vessel revenues for all species or species groups, except gag where handlines accounted for most of the ex-vessel revenues. In terms of the number of boats, number of trips, and days away from port, handlines dominated the grouper and tilefish effort.

Table 3.3.1.3. Average annual fishery performance by gear type, 1993-2006

	Diving	Handlines	Longlines	Other Gear	Traps	Trolling
Landings (thousand pounds)						
Red Grouper	10	1,299	3,203	8	754	2
Gag	30	893	448	5	12	3
SWG	52	2,907	4,040	18	796	8
DWG	0	198	966	1	4	1
Tilefish	0	20	497	0	1	0
Revenues (thousand dollars)						
Red Grouper	26	3,296	8,250	22	1,866	6
Gag	95	2,870	1,427	16	37	11
SWG	159	8,399	10,875	52	1,996	24
DWG	1	462	2,585	2	8	2
Tilefish	0	29	847	1	1	1
Boats						
Red Grouper	42	586	146	10	65	12
Gag	31	465	112	5	28	14
SWG	50	791	165	14	67	27
DWG	4	262	127	2	8	5
Tilefish	1	121	98	1	4	1
Trips						
Red Grouper	210	4,509	1,298	28	562	21
Gag	172	3,654	788	17	158	35
SWG	324	7,344	1,475	43	612	63
DWG	4	1,401	718	3	12	6
Tilefish	1	364	457	1	8	2
Days Away from Port						
Red Grouper	350	17,229	11,749	122	3,035	46
Gag	276	12,451	7,411	47	890	58
SWG	489	25,217	13,203	153	3,151	121
DWG	10	5,951	6,546	16	90	22
Tilefish	3	2,086	4,187	7	44	6

Fishery Performance by Area

Because grouper caught in the Gulf are landed mostly in Florida, distribution of landings by area (port of landing) is presented by combining Alabama through Texas (AL-TX) as one area and separating Florida into three areas—Southwest FL (Monroe County to Charlotte County), West-Central FL (Sarasota County to Citrus County), and Northwest FL (Levy County to Escambia County), and other areas. Although the case for tilefish is a little different, since substantial tilefish landings also occur in the other Gulf states, the geographic division is maintained because grouper harvests dominate the assessment.

Table 3.3.1.4 presents several fishery performance measures by area. For the period 1993-2006, West-Central FL led all other areas in the red grouper average annual landings, followed by Northwest FL, Southwest FL, and AL-TX. For gag, AL-TX had the highest average annual landings, followed by West-Central FL, Northwest FL, and Southwest FL. It should be noted, however, that the combined gag landings of the three Florida areas significantly outweighed those of AL-TX. West-Central FL also led in the landings of all SWG species combined, followed by Northwest FL, AL-TX, and Southwest FL. For DWG, AL-TX led all areas, followed by West-Central FL, Southwest FL, and Northwest FL. Again, the combined DWG landings of all Florida areas outweighed those of AL-TX. For tilefish, AL-TX led all areas in landings, followed by West-Central FL, Northwest FL, and Southwest FL.

The distribution of average annual revenues by area mirrors that of landing. West-Central FL had the highest average annual revenues for red grouper and SWG, while AL-TX had the highest revenues for gag, DWG, and tilefish. Again it should be stressed that when all Florida areas are combined, AL-TX had the highest average annual revenues only for tilefish.

In terms of the average annual number of boats landing at least one pound of the selected species, AL-TX led all areas for all selected species. Considering the ranking of AL-TX for total average annual landings and revenues of grouper and tilefish, it appears that many boats in this area caught relatively small amounts of these species. Within Florida, more boats were registered to West-Central FL counties for all selected species. Northwest FL had more boats than Southwest FL for red grouper and gag, but not for SWG, DWG, and tilefish. The distribution of trips and days away from port is similar to that of boats, suggesting that, on average, the average annual number of trips and days away from port are directly related to the number of boats in the area.

Table 3.3.1.4. Average annual fishery performance by area (landing port location), 1993-2006

	AL-TX	Northwest FL	W-Central FL	Southwest FL	Others
Landings (thousand pounds)					
Red Grouper	659	1,224	2,455	836	103
Gag	476	364	457	79	14
SWG	1,678	1,772	3,157	1,067	147
DWG	667	49	315	115	23
Tilefish	349	48	73	38	11
Revenues (thousand dollars)					
Red Grouper	1,667	3,075	6,304	2,148	271
Gag	1,519	1,170	1,462	256	48
SWG	4,866	4,815	8,533	2,879	412
DWG	2,005	148	937	333	65
Tilefish	625	84	98	54	19
Boats					
Red Grouper	274	239	260	234	62
Gag	289	182	198	87	36
SWG	441	258	271	269	88
DWG	217	55	101	75	27
Tilefish	119	28	59	46	14
Trips					
Red Grouper	2,077	1,455	1,901	1,042	153
Gag	2,177	1,093	1,211	266	78
SWG	4,408	1,733	2,094	1,401	224
DWG	1,483	102	315	195	49
Tilefish	508	51	138	114	22
Days Away from Port					
Red Grouper	6,884	7,536	11,530	5,776	804
Gag	6,634	4,758	7,425	1,965	351
SWG	14,404	8,048	12,137	6,663	1,080
DWG	6,871	842	3,172	1,417	332
Tilefish	3,430	459	1,475	795	173

Harvest Composition by Species

As part of a multi-species fishery, a fishing trip in the reef fish fishery in general and the grouper and tilefish component in particular catches a variety of species. Table 3.3.1.5 presents the percent distribution of species caught on trips landing at least one pound of the selected species or species group (red grouper, gag, any SWG species, any DWG species, or tilefish). All results are calculated as the percent of the total harvest on the trip (all reef and non-reef fish species combined). The results for individual species or sub-groups sum to the respective higher level category. For example, red grouper, gag, and other shallow-water grouper (OSWG) sum to SWG. Similarly, SWG, DWG, tilefish, snappers, and other reef fish (ORF) sum to reef fish.

As seen in Table 3.3.1.5, SWG species were the dominant harvest for trips landing at least one pound of red grouper, gag, or SWG. For trips landing at least one pound of DWG, the dominant species group was snappers and more SWG were caught on those trips than DWG. Tilefish was the dominant species for trips landing at least one pound of tilefish. Within the SWG group, red grouper was clearly the dominant species caught on trips landing at least one pound of any of the selected species.

Table 3.3.1.5. Percent species composition on trips landing at least one pound of selected species, 1993-2006

Period	Red G	Gag	OSWG	SWG	DWG	Tilefish	Snappers	ORF	Reef	Non-Reef	All Species
Red Grouper											
1993-98	55.4	10.6	12.7	78.7	3.5	0.6	9.7	4.8	97.3	2.7	100.0
1999-04	52.1	19.2	10.7	82.0	3.5	0.4	9.6	2.5	98.1	1.9	100.0
2004-06	52.4	18.0	8.1	78.5	2.4	0.4	14.6	2.3	98.3	1.7	100.0
1993-06	53.3	15.9	10.9	80.2	3.3	0.5	10.6	3.3	97.8	2.2	100.0
Gag											
1993-98	43.7	20.1	3.9	67.8	5.2	0.7	18.2	5.8	97.7	2.3	100.0
1999-04	41.4	26.7	3.7	71.8	5.5	0.5	17.6	3.3	98.7	1.3	100.0
2004-06	46.7	23.6	3.8	74.1	4.6	0.4	16.9	2.6	98.7	1.3	100.0
1993-06	43.2	23.8	3.8	70.8	5.2	0.5	17.7	4.1	98.4	1.6	100.0
SWG											
1993-98	36.9	8.3	11.1	56.3	6.1	1.1	27.4	6.2	97.2	2.8	100.0
1999-04	36.7	15.3	9.6	61.6	5.8	0.7	26.3	3.6	98.0	2.0	100.0
2004-06	39.3	14.5	7.4	61.2	5.8	0.6	27.9	2.7	98.2	1.8	100.0
1993-06	37.3	12.7	9.7	59.6	5.9	0.8	27.0	4.3	97.7	2.3	100.0
DWG											
1993-98	15.4	2.9	7.2	25.5	23.4	5.3	37.1	5.5	96.8	3.2	100.0
1999-04	15.0	8.1	7.4	30.5	23.8	4.3	36.1	3.7	98.4	1.6	100.0
2004-06	16.2	8.3	6.4	30.9	29.2	4.3	32.1	2.4	99.0	1.0	100.0
1993-06	15.3	6.3	7.2	28.7	24.7	4.7	35.7	4.1	97.9	2.1	100.0
Tilefish											
1993-98	11.3	2.2	7.5	21.1	34.8	13.0	23.7	5.1	97.6	2.4	100.0
1999-04	9.2	5.9	6.7	21.8	43.3	13.3	17.0	3.1	98.5	1.5	100.0
2004-06	9.5	5.5	5.1	20.1	40.4	15.5	19.7	2.9	98.5	1.5	100.0
1993-06	10.1	4.5	6.7	21.2	39.6	13.6	19.9	3.8	98.2	1.8	100.0

Reef Fish Dealers

As of April 6, 2009, there were 166 active Gulf reef fish dealer permits. Because the reef fish dealer permit is an open access permit, the number of dealers can vary from year to year. For the period 2004-2007, reef fish dealers handled an average of 10.8 mp of grouper and tilefish valued at $25.4 million. Florida dealers dominated grouper and tilefish purchases, accounting for 10 mp of harvest valued at $23.5 million, followed by Alabama and Mississippi (102,000 pounds valued at $222,000), Louisiana (270,000 pounds valued at $592,000), and Texas (434,000 pounds valued at $1.03 million). The rest of the grouper and tilefish purchases were made by dealers from outside the Gulf.

Economic Impacts

Estimates of the economic impacts of the Gulf bottom longline component of the reef fish fishery are not available. Proxy values for this sector of the fishery are drawn from estimates of the commercial grouper and tilefish landings for west Florida using 2006 landings and value data. This information was originally provided in Amendment 30B (GMFMC 2008a). The total 2006 output (sales) impacts of the commercial grouper and tilefish segment of the fishery on the Florida economy was approximately $88.2 million, supporting an estimated 1,848 jobs. The largest component of these impacts accrued to the restaurant sector, accounting for approximately $45.8 million and 1,202 FTE jobs, followed by the harvest sector, accounting for approximately $22.3 million and 425 FTE jobs. These estimates include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures by employees in the direct and indirectly affected sectors). Because of the adaptations of standard economic impact models or assumptions required to develop economic impact models of fishery sectors, caution is advised in comparing these estimates with those of the recreational sector due to potential differences in methodology.

Imports

Imports of snappers and groupers into the United States are summarized in Table 3.3.1.6. Imports steadily increased over the 1993-2006 period, from a low of 22 mp in 1994 to a high of 49.7 mp in 2005, with a slight decline in 2006. This is in contrast to domestic production of all reef fish in the Gulf which, although averaging 18.4 mp annually, had been declining since its peak in 2002. In addition, the lowest import level of 22 mp in 1994 is higher than the highest reef fish production of 20.5 mp in 2002. Although the levels of domestic production and imports are not totally comparable for a variety of reasons, such as fresh product versus frozen product and possible product mis-labeling, the difference in magnitude indicates the dominance of imports in the reef fish market.

The value of imports also rose steadily over the years, from a low of $42.3 million (after adjusting for inflation) to its highest level of $101.7 million in 2006. The value of domestic production, on the other hand, rose slightly in the first years but declined after reaching its peak of $50.1 million in 2001. In 2006, the value of domestic reef fish production stood at $43.5 million, which is less than half of that of imports. Again, it should be noted that the two values are not strictly comparable, but the difference in magnitude still signifies the large market share of imports in the domestic market for reef fish.

Table 3.3.1.6. U.S imports of snapper and grouper, combined fresh and frozen

Year	Quantity (million lbs.)	Nominal Value (million $)	Real Value (million 2006 $)
1993	24.1	32.9	45.5
1994	22.0	30.9	42.3
1995	28.2	38.5	50.8
1996	33.0	47.5	61.3
1997	40.3	58.0	74.9
1998	38.8	58.5	77.4
1999	35.4	53.9	70.8
2000	38.7	63.0	78.2
2001	39.5	62.3	76.4
2002	42.6	69.5	87.3
2003	44.5	73.3	87.4
2004	43.1	75.6	84.9
2005	49.7	93.1	97.5
2006	48.6	101.7	101.7

3.3.2 Recreational Sector

Because this amendment is mainly concerned with the commercial reef fish fishery, the description of the recreational sector in the Gulf is incorporated herein by reference. A detailed description of the Gulf recreational sector is provided in several amendments including, Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007), Reef Fish Amendment 30A (GMFMC 2008b), and Reef Fish Amendment 30B (GMFMC 2008a).

4.0 AFFECTED SOCIAL AND ADMINISTRATIVE ENVIRONMENTS

4.1 Description of the Social Environment

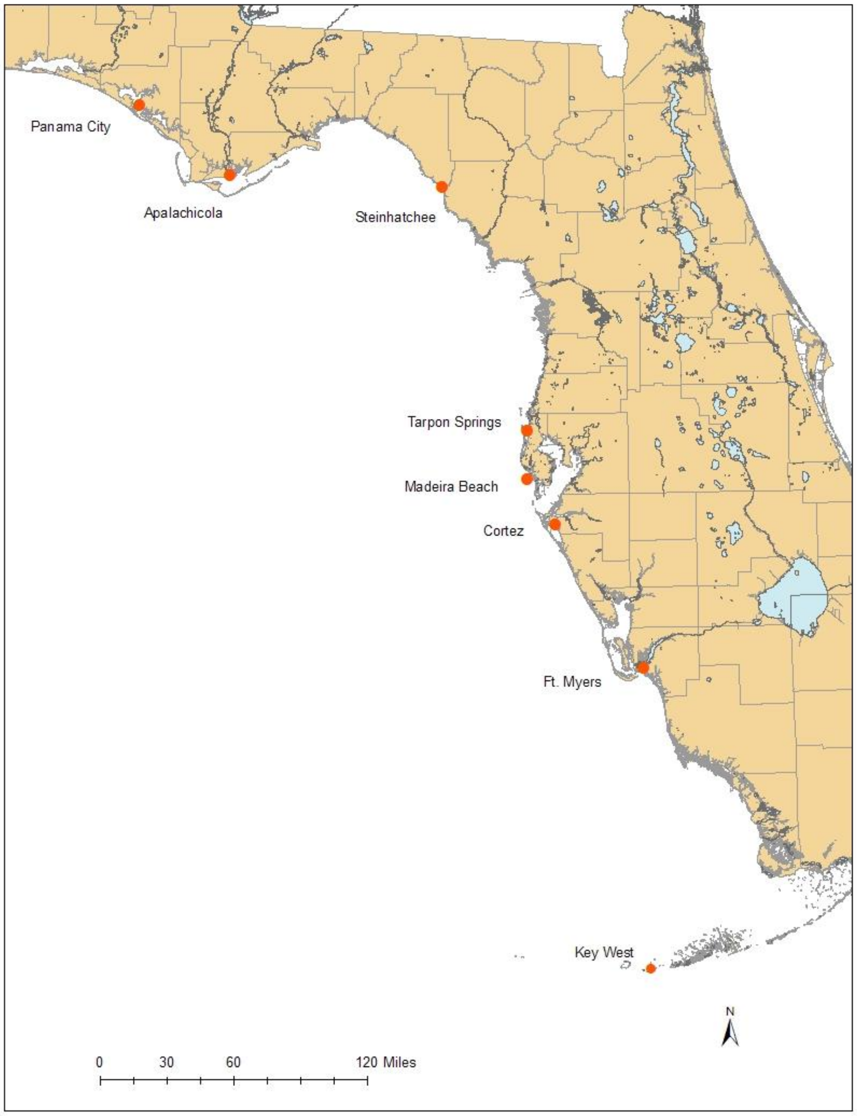

Figure 4.1.1. Florida communities identified by industry representatives as potentially affected by actions within the amendment (R. Spaeth and K. Bell, industry representatives, personal communication).

The communities that would most likely be affected by actions within this amendment are shown in Figure 4.1.1 and were selected through discussions with industry representatives. While the majority of vessels that fished the area where interactions with turtles occurred are from the west-central Florida coast, actions here will have impacts on all longline operations in the eastern Gulf. Some vessels home ported in the communities of Panama City, Apalachicola, Steinhatchee, Ft. Myers and Key West may be affected as they may fish those areas off the west-central Florida coast during some times of the year and would also be affected by measures that are inclusive of all longline vessels. In addition, dealers throughout the west coast of Florida may be affected by actions within this amendment. For this description of communities, however, the focus will be on those communities where the majority of fishing effort is derived and most vessels are home ported and may be impacted by most alternatives.

A description of landings data for several other communities is included toward the end of this section as they have demonstrated a sufficient threshold of landings of red grouper over the time period of 1999-2007 to be included within **Action 3 Alternative 7 in Section 6.** Landings data were aggregated from1999-2007 for total pounds landed and value during the entire time period. Species totals were then divided by the overall total landings and value to determine the percentage contribution to overall landings and value for the community over that time period. This time period corresponds with the overall time period chosen for participation in the longline endorsement described in **Action 3, Option a and b**.

This description will begin at the county level and follow with a description of the communities within in each county. Utilizing demographic data at the county level will allow for updated statistics from the Census Bureau which produces estimates for geographies (counties; minor civil divisions; census designated places, etc.) that are larger than 20,000 prior to the decennial census.[9] Because employment opportunities often occur within a wider geographic boundary than just the community level, a discussion of various demographics within the county is appropriate.

The county-level description will focus primarily on the demographic character and a discussion of coastal growth and development that seems to affect many coastal communities, especially those with either or both commercial and recreational working waterfronts. The rapid disappearance of these types of waterfronts has important implications for the disruption of various types of fishing-related businesses and employment and has generated programs to protect and preserve this infrastructure (Stan Mayfield Working Waterfronts Florida Forever Grant Program 2009; North Carolina Sea Grant 2007). The process of "gentrification" which tends to push those of a lower socio-economic classes out of traditional communities as property values and taxes rise has become common along coastal areas of the U.S. and around the world. Working waterfronts tend to be displaced with development that is often stated as the "highest and best" use of waterfront property, but often is not associated with water-dependent occupations. However, with the continued removal of these types of businesses over time the local economy becomes less diverse and more reliant on the service sector and recreational tourism. As home values increase, people within lower socio-economic class find it difficult to live within these communities and consequently spend more time and expense commuting to work if jobs continue to be available. Newer residents often have no association with the water-dependent employment and may see that type of work and its associated gear as unappealing to the aesthetics of the community. Looking at demographic trends within counties and

[9] American Community Survey estimates are based on data collected over a three year time period. The estimates represent the average characteristics of population and housing between January 2005 and December 2007 and do not represent a single point in time. Because these data are collected over three years, they include estimates for geographic areas with populations of 20,000 or more. The ACS one-year estimates are only available for geographic areas with populations of 65,000 or more.

communities can provide some indication as to whether these types of coastal change may be occurring.

Although the most recent estimates of census data have been used here, many of the statistics related to the economic condition of counties and communities do not capture the most recent downturn in the economy which may have significant impacts on current employment opportunities and business operations. Therefore, in the demographic descriptions of both counties and communities, it should be understood that in terms of unemployment, the current conditions could be worse than indicated by the estimates used here. To be consistent, census data are used for the various demographic characteristics and as noted earlier are limited to the most recent estimates which are 2007 and in some cases 2008. More current data are noted when available. Other aspects of trade and market forces as a result of the economic downturn could also affect the business operations of vessels, dealers, wholesalers and retail seafood businesses and may not be reflected in the demographic profile provided here.

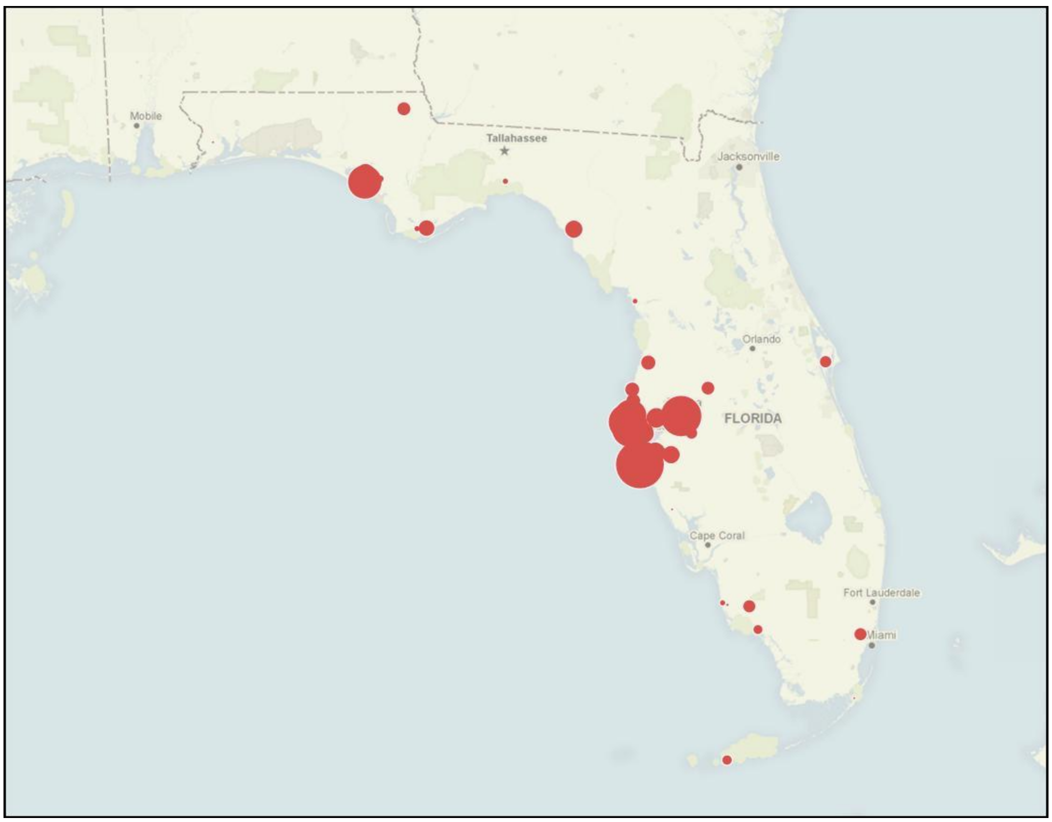

Figure 4.1.2. Longline shallow-water grouper 2007 landings by zip code of vessel permit owner (Source: SEFSC Logbook Data).

The majority of SWG landings are concentrated along Florida's west central coast in Pinellas and Manatee Counties as seen in Figure 4.1.2. Other areas of the state with less concentrated landings are in the Panama City, Apalachicola, and Steinhatchee. The following discussion will focus on the primary counties and communities involved in the SWG component of the reef fish fishery with an emphasis on those with longline vessels and with limited discussion on those communities less involved in the fishery and gear type.

Pinellas County

Table 4.1.1. Pinellas County census demographics (Source: U.S. Census Bureau)

Factor	1990	2000	2007
Total population	851,659	921,495	922,147
Population Density (Persons per sq. mi.)*	2895	3132	3351
Median Age	-	43	44.8
Ethnicity or Race (Percent)			
White	90.5	87.2	85.4
Black or African American	7.7	9.4	10.6
American Indian and Alaskan Native	0.2	0.7	0.7
Asian	1.1	2.4	3.2
Hispanic or Latino (any race)	2.4	4.6	6.7
Educational Attainment (Population 25 and over)			
Percent with less than 9th grade	6.6	3.9	3.5
Percent high school graduate or higher	78.1	84	87.2
Percent with a Bachelor's degree or higher	18.5	22.9	26.6
Household income (Median $)	26,296	37,111	43,591
Poverty Status (Percent of population with income below poverty line)	9.5	10	11.6
Home Ownership (Percent)			
Owner occupied	69.2	70.8	71.2
Value Owner-occupied Housing (Median $)	73,800	96,500	190,800
Employment Status (Population 16 yrs and over)			
Percent of civilian labor force unemployed	4.5	4.3	5
Occupation (Percent)			
Management, professional, and related occupations	-	34.2	35.6
Service occupations	-	15.5	16.5
Sales and office occupations	-	31	29.5
Farming, fishing, and forestry occupations	1.5	0.2	0.1
Construction, extraction, and maintenance occupations	-	8.1	8.9
Production, transportation, and material moving occupations	-	11	9.4
Industry (Percent)			
Agriculture, forestry, fishing and hunting	1.6	0.2	0.2
Manufacturing	13	10.1	8.7
Percent government workers	11	10.8	10.8

* Data from NOAA Spatial Patterns of Socioeconomic Data 1970 to 2000 and the U.S. Census Bureau 2009

Pinellas County has seen steady growth since 1990 through 2007 as its population has grown to 922,127. A majority of Pinellas County residents were white for all three past decennial censuses, but that number has decreased steadily over the years and has been estimated to have dropped to 85.4% in 2007. Of the minority populations, Hispanics have seen the greatest growth from 2.4% in 1990 to 6.7% in 2007 with African Americans the largest minority population at 10.7%. In 2007, overall, Florida's population was 77.8% white 20.1% Hispanics and 16.0% African Americans. The median age for residents of Pinellas County was estimated to have been 44.8 years which is slightly higher than the median age for the entire state. Coastal urban areas like St. Petersburg and others are popular retirement destinations as they offer numerous medical facilities and other amenities that are desirable to retirees. Unemployment in Pinellas County in 2007, at 5%, was lower than the state-wide unemployment rate of 6%. The percentage of families below the poverty level was estimated at 8.2% which was also below the 9% for the state as a whole during 2007. Pinellas County had a slightly higher owner-occupied housing rate than the state with slightly over 71.2% of owner-occupied housing to the state-wide estimate of 70.3% for 2007. Although the median value of homes in the county has more than doubled since the 1990s at $190,800, it is still below the state average (U.S. Census Bureau 2009).

Pinellas County is highly urbanized with a population density that grew from 1,775 persons per square mile in 1970 to just over 3,132 persons per square mile in 2000. State–wide Florida had an estimated overall population density of 338 persons per square mile in 2007 up slightly from 296 in 2000 (NOAA Spatial Patterns of Socioeconomic Data 1970 to 2000 and the U.S. Census Bureau 2009).

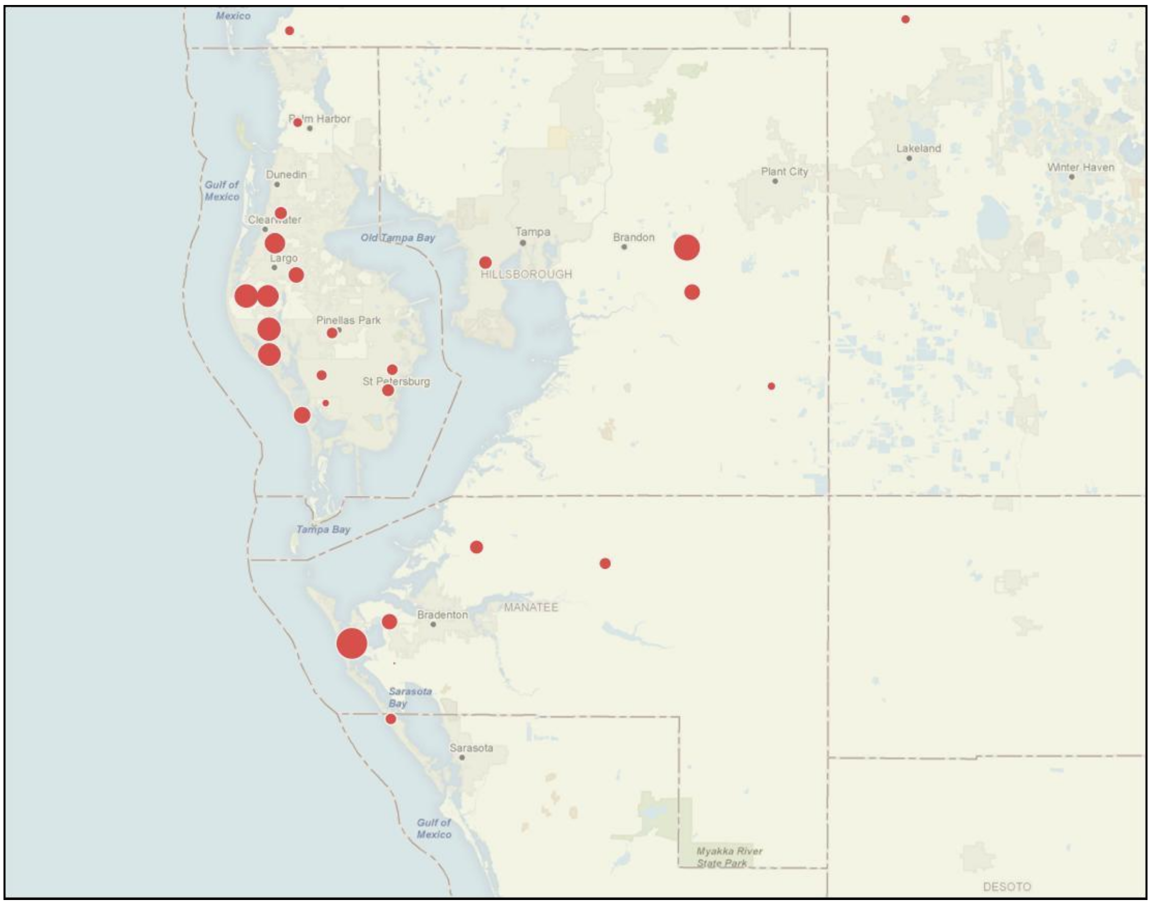

Figure 4.1.3. Longline shallow-water grouper 2007 landings by zip code of vessel permit owner for Hillsborough, Pinellas and Manatee Counties (Source: SEFSC Logbook Data).

Pinellas County Communities

Madeira Beach is centrally located among a series of barrier island communities just west of St. Petersburg on the Gulf coast of Pinellas County that have become known as important tourist destinations for their white sand beaches. Madeira Beach is primarily a residential community with few industrial or service businesses, although the John's Pass area continues to grow with a variety of shops and restaurants that cater to both locals and tourists.

The community of Madeira Beach is often called the "Grouper Capital of the U.S." because the majority of grouper harvested in the U.S. waters are landed here (Wilson et al. 1998). While the community continues to land the majority of grouper, there has been considerable change in the makeup of the commercial fleet. There were once four fish houses that catered to a commercial fleet estimated to include 130 vessels that offloaded regularly at local docks (Lucas 2001). That number has declined to around 70-75 vessels today, the majority of which are longline vessels and according to one industry representative, they continue to constitute over 95% of the fleet home ported there (R. Spaeth, personal communication). Longline vessels have on average 3-4 crew members including the captain. There were an estimated 441 employees working on vessels and employed at fish houses in 2000 with many living in close proximity if not in the community itself (Lucas 2001). Today , the number of employees for both vessels and fish houses has declined, as the number the number of vessels and fish houses has declined and may be around 300 based on estimates from earlier research (Lucas 2001). It was estimated that there were 48 bandit reel vessels in Madeira Beach in 2000. However, that number has fallen noticeably over the past nine years according to one industry representative (R. Spaeth, personal communication).

In terms of reliance on Gulf reef fish, total landings within Madeira Beach for the time period 1999-2007 indicate substantial reliance upon red grouper in terms of pounds landed at just below 40% and just above 45% of overall value. Other species that are important to the total landings in Madeira Beach are gag and yellowedge grouper (Figure 4.1.4). Shark fins are not measured by the pound and therefore have only a bar representing value. If the majority of vessels that presently off-load in Madeira Beach are longline vessels, Figure 4.1.4 suggests fish dealers in this community rely substantially upon several species harvested with that gear type.

Since the emergency rule to prohibit longline gear inside of 50 fathoms off Florida's westcentral coast has been implemented, vessel owners have adopted several strategies to mitigate the impacts. Many vessels in the Madeira Beach area have converted either permanently or temporarily to vertical line gear. To reduce the costs of this conversion, some are using rod and reels rather than permanently installed "bandit reels." As a result, many vessels have had reduced landings and are not meeting trip expenses with the amounts of fish landed. Hired captains are taking on increased debt and fish houses are often left with these expenses unpaid as some captains have been let go, while others have quit. Overall landings for one fish house have dropped from 100,000 pounds to 5,000 pounds a month according to the manager who said that several employees have been laid off and leased equipment returned (R. Spaeth, personal communication). According to NMFS port agents, an estimated 75% of longline vessels in this area may have converted to vertical line fishing. Those who have not converted are choosing to fish elsewhere or have chosen to tie vessels to the dock and not fish at all. Some vessels were fishing outside of 50 fathoms until the deepwater grouper component of the fishery closed.

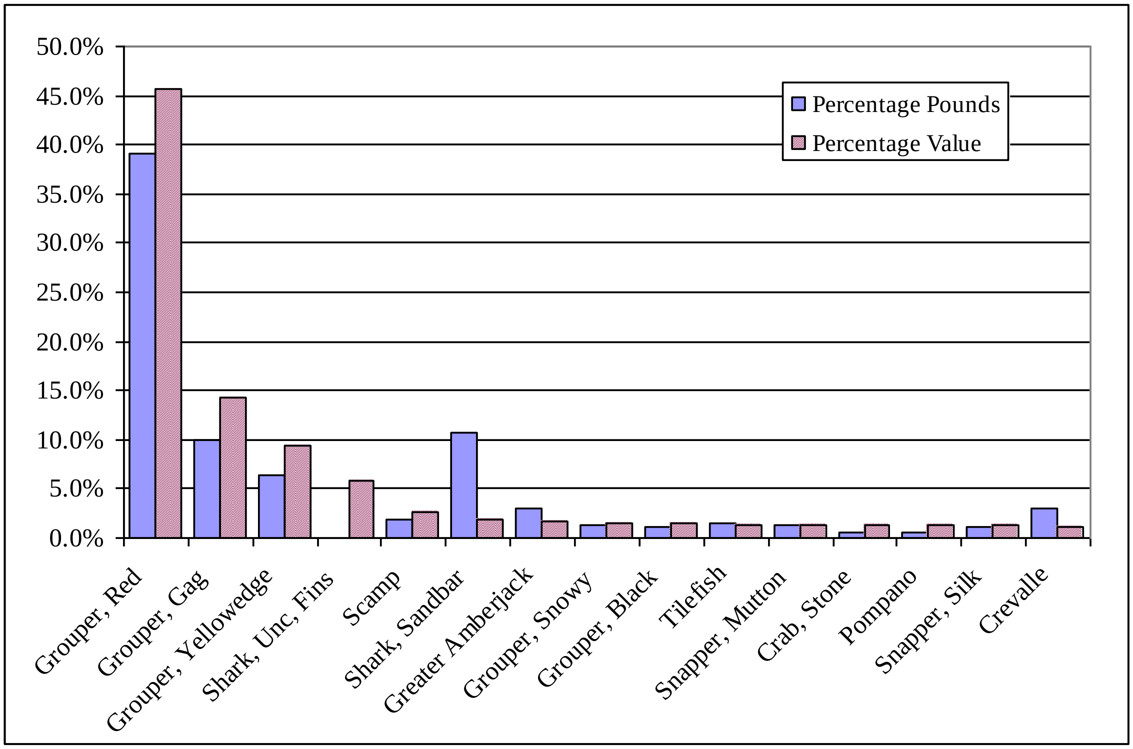

Figure 4.1.4. Percentage of pounds and value for top fifteen species landed from total landings in Madeira Beach 1999-2007 (Source: ALS SEFSC 2009).

The community of Tarpon Springs is approximately 25 miles north of Madeira Beach on U.S. Highway 19. There are longline vessels located within the community that would also be affected by the actions within this amendment. This community has a long history associated with commercial sponge fishing, but tourism has capitalized on that image as sponge fishing itself has declined and dockside areas are filled more with tourist than fishermen today. There were as many as 50 fishing vessels home ported in Tarpon Springs in 2002, most of them shrimp vessels. That number may have declined as the shrimp fishery has experienced a severe downturn due to economic hardship from increasing imports and fluctuating fuel prices (Impact Assessment, Inc. 2005).

Of those species that dominate landings in Tarpon Springs in terms of value, pink shrimp is by far the most valuable contributing over 30% of value for total landings from 1999-2007(Figure 4.1.5). Red grouper is second in terms of value and pounds landed with just over 15% of value and 14% of pounds landed. Stone crab and gag grouper are the next two most valuable species, with stone crab accounting for 15% of value for landings within the community.

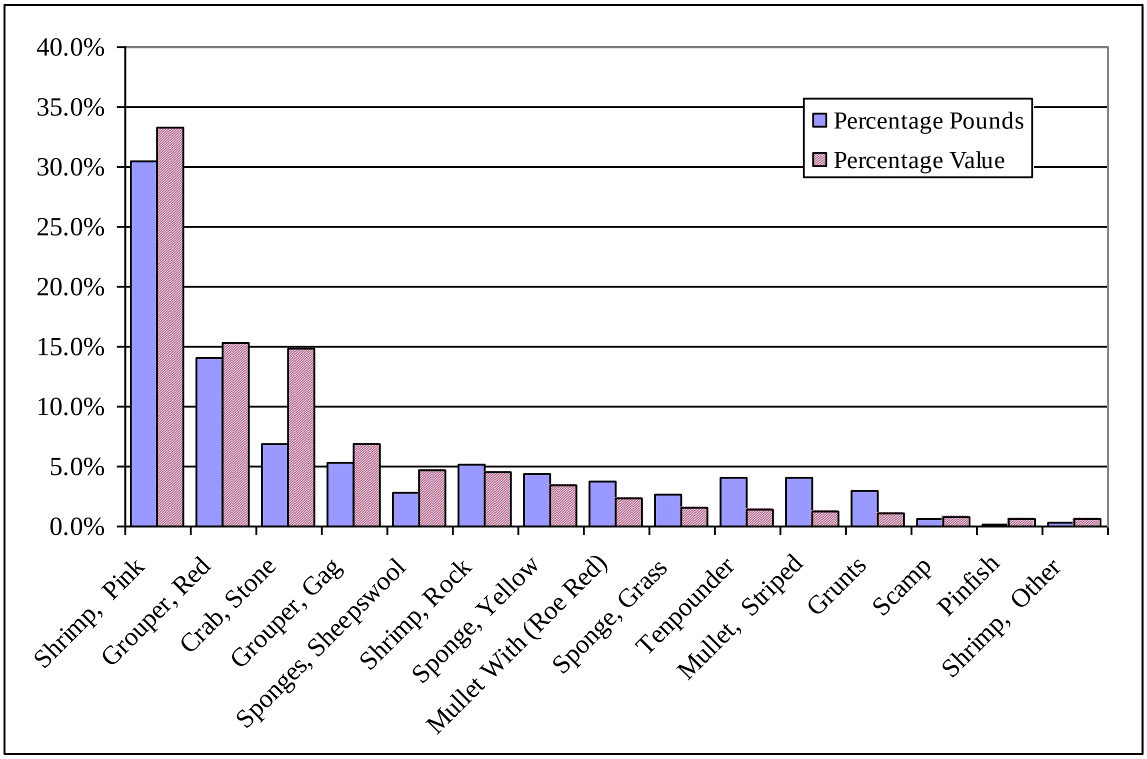

Figure 4.1.5. Percentage of pounds and value for top fifteen species landed from total landings in Tarpon Springs 1999-2007 (Source: ALS SEFSC 2009).

With the emergency rule prohibiting longline gear inside of 50 fathoms, according to NMFS port agents one longline vessel from Tarpon Springs has converted to vertical line gear while another is fishing elsewhere. Other vessels may not be fishing at all or no longer homeporting there.

Both communities within Pinellas County are surrounded by highly urbanized or suburbanized environments that are embedded within a coastal economy that is driven by recreational tourism and seasonal residence by retirees or tourists. The county is the most densely populated county in the state with a population density twice that of the most populous county in Florida, Miami-Dade. Because development pressures have existed for some time, waterfront property that has not experienced some type of redevelopment is likely exceptional. According to one fish house owner, prior to the decline in the housing market, there were offers to purchase the waterfront property his fish house occupied for redevelopment into condos. While these pressures have lessened with the current recession, economic recovery may result in renewed attempts to acquire these working waterfronts for redevelopment.

Manatee County

Table 4.1.2. Manatee County Census Demographics (Source: U.S. Census Bureau)

Factor	1990	2000	2007
Total population	211,707	264,002	310,764
Population Density (Persons per sq. mi.)*	281	350	424
Median Age	-	43.6	43.1
Ethnicity or Race (Percent)			
White	89.9	87.5	84.4
Black or African American	7.8	8.6	8.9
American Indian and Alaskan Native	0.2	0.6	0.6
Asian	6	1.1	1.8
Hispanic or Latino (any race)	4.5	9.3	12.5
Educational Attainment (Population 25 and over)			
Percent with less than 9th grade	8.1	5.6	4.5
Percent high school graduate or higher	75.6	81.4	85.7
Percent with a Bachelor's degree or higher	15.5	20.8	25.7
Household income (Median $)	25,951	38,673	50,416
Poverty Status (Percent of population with income below poverty line)	10.2	10.1	10.9
Home Ownership (Percent)			
Owner occupied	70.9	73.8	73.5
Value Owner-occupied Housing (Median $)	79,400	119,400	231,000
Employment Status (Population 16 yrs and over)			
Percent of civilian labor force unemployed	4.9	3.6	4.8
Occupation (Percent)			
Management, professional, and related occupations	--	29.1	30.3
Service occupations	--	16.9	16.6
Sales and office occupations	--	28.2	28
Farming, fishing, and forestry occupations	4.1	1.4	1
Construction, extraction, and maintenance occupations	--	11.2	12.3
Production, transportation, and material moving occupations	--	13.2	11,8
Industry (Percent)			
Agriculture, forestry, fishing and hunting	4.4	1.6	1.1
Manufacturing	13.5	11.7	9.2
Percent government workers	11.8	12.4	12.4

* Data from NOAA Spatial Patterns of Socioeconomic Data 1970 to 2000 and the U.S. Census Bureau 2009

Manatee County had a total population of 264,002 in 2000 that is estimated to have grown to over 310,000 by 2007 and almost 330,201 by 2008 (Manatee Economic Development Council 2009). The population density for the county has grown rapidly from an estimated 129 persons per square mile in 1970 to just over 350 persons in 2000 and 424 persons in 2007 (NOAA Spatial Patterns of Socioeconomic Data 1970 to 2000 and the U.S. Census Bureau). The majority of residents was identified as white (84.4%) in 2007 and was estimated to have dropped slightly to 83.3% in 2008. The Hispanic population has grown from 4.5% in 2000 to over 13.0% in 2008 (Manatee Economic Development Council 2009). The median age for the residents of Manatee County was estimated to have been 43.1 years or slightly older than the state-wide average. An estimated 4.8% of the population in the civilian force was unemployed in Manatee County, which was lower than the state-wide average of 6%. The percentage of individuals below the poverty level was estimated at 10.9% in 2007 which was higher than the 9% state-wide average. Manatee County had a slightly higher owner occupied housing rate in 2007 than for the whole state with slightly over 73.5% compared to 70.3% (U.S. Census Bureau).

Figure 4.1.6. Historic commercial working waterfront Cortez, Florida (Source: Google Earth 2009).

Manatee County Communities

The community of Cortez is listed as a potential fishing community in Manatee County and classified as primarily involved in fishing (Impact Assessment, Inc. 2005). In Figure 4.1.6 the two operating fish houses are the A.P. Bell Fish Company (Co.) on the far left and Cortez Bait and Seafood on the far right. There is a long history of commercial fishing in Cortez as many descendants of the North Carolina fishermen who settled the community in the 1800s still live and work there. Historically, this community was principally involved in the inshore net fishery for mullet and other finfish until the 1994 constitutional amendment that banned the traditional net gear. Many fishermen moved into other inshore and offshore fisheries. In the 1970s, prior to the net ban, there was an expansion into the offshore reef fish fishery that continues today with both vertical line and longline vessels home ported within the community. There were three fish house operating in the community prior to the net ban, but shortly after the implementation of the ban, two fish houses closed. Cortez Bait and Seafood opened during the late nineties, but little, if any reef fish are landed there. The A.P. Bell Fish Company with approximately 60 employees was established in the 1940s and has numerous reef fish vessels that offload snapper and grouper. Much of the product landed at A.P. Bell Fish Co. goes to local or regional markets serving retail stores and restaurants.

It is estimated that 17 reef fish vessels homeport in the area and all but three offload at A.P. Bell Fish Co., the majority are longline vessels. The other vessels that do not land fish at Bell Fish Co. offload at private docks and sell to another wholesaler. None of the vessels from the community fish for shark (G. Brooks, personal communication).

The community of Cortez has been pressured by coastal development as sprawling growth from Bradenton moves west. There has been a celebrated resistance to a variety of development conflicts within the village over many years which have resulted in the waterfront and contiguous neighborhoods being listed as a National Register Historic District. The community was named a Florida Waterfronts Community in 1995 and implemented zoning regulations to limit the type of development and retain the working waterfront and commercial character. Rising property values and taxes have made it difficult for commercial fishermen to live within the historic village proper and many now live in Bradenton and the surrounding area. The community recently celebrated the opening of a maritime museum located in the old rural grade school that highlights the commercial fishing heritage of the community and educates the public in historic boat building techniques and other aspects of fishing culture. Earlier in the decade, land was purchased by a non-profit within the community to form the FISH Preserve which will act as a buffer to development and preserve environmentally sensitive land protecting the historic village from encroaching development (http://fishnews.org/preserve/ accessed March 11, 2009).

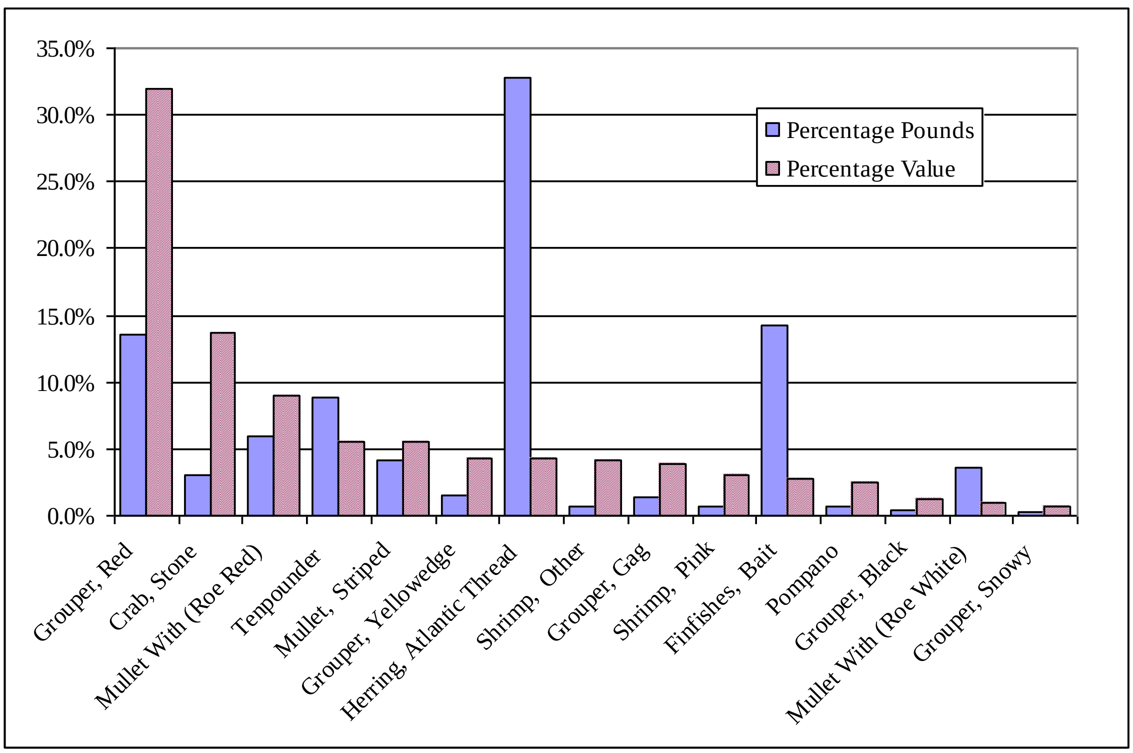

Figure 4.1.7. Percentage of pounds and value for top fifteen species landed from total landings in Cortez, Florida 1999-2007 (Source: ALS SEFSC 2009).

The community of Cortez had significant landings of baitfish as just over 30% of all pounds landed during 1999-2007 were baitfish (Figure 4.1.7). However, in terms of value, red grouper is by far the most important species with over 30% of value from all species landed attributed to that species which far outgains other species landed in the community. Because the majority of reef fish landings here come from longline vessels, the fishing community is highly reliant on longline gear and has been affected by recent regulatory changes.

Since the implementation of the emergency rule, several vessels homeported in Cortez have converted to vertical line but have seen a significant reduction in landings (G. Brooks and K. Bell, personal communication). Some captains of fleet owned vessels have quit or were let go because of an inability to generate sufficient revenue from catches to meet the costs of a fishing trip. As a result the fish houses have been forced to accept losses for hired captains who decide to leave. Employees at one fish house have been let go and for those that remain hours have been cut back. Some dealers with freezing capability must rely on frozen fish to meet the demand as the supply of fresh fish is insufficient (K. Bell, personal communication).

Other Communities with Longline Vessels and Landings

Panama City has a long history of both commercial and recreational fishing. Today there remains substantial infrastructure devoted to both fisheries. The community had nine active processors and employed 55 persons in 2000. There were numerous docking facilities for both commercial and recreational fishermen at that time (Impact Assessment, Inc. 2005). However, with little information since 2000 the current status of fishing infrastructure in the community is unknown. However, the community does have the highest percentage of longline vessels home ported in a community.

The top species in terms of landings and value from 1999-2007 in Panama City are red snapper and yellowfin tuna with red snapper contributing over 20% of the value of all landings and yellowfin tuna approximately 17%. Gag grouper was next in terms of value and fourth in pounds landed. Red grouper was fourth in percentage of value with just below 15% of value for all landings (Figure 4.1.8).

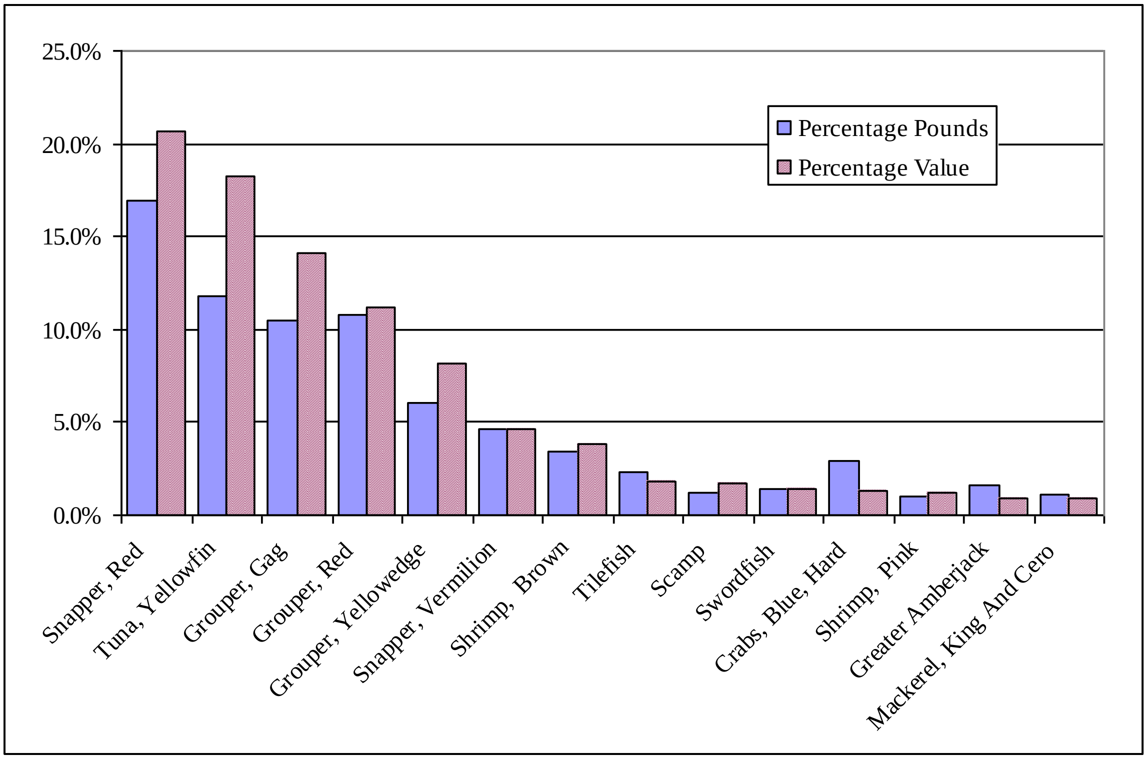

Figure 4.1.8. Percentage of pounds and value for top fifteen species landed out of total landings in Panama City, Florida 1999-2007 (Source: ALS SEFSC 2009).

Apalachicola also has a long history with both commercial and recreational fishing. Today there remains a working waterfront with landings of various species including shrimp, oysters and grouper. The community has a substantial amount of infrastructure devoted to both commercial and recreational fishing, but is seeing an increasing growth in tourism which could increase pressure for development on the working waterfronts. (Impact Assessment, Inc. 2005).

Oysters are by far the most important species in terms of value of landings for the community, with just below 25% of value for all landings over the time period of 1999-2007 as seen in Figure 4.1.9. Oysters represent slightly over 23% of landings in terms of pounds. Pink shrimp is the second most valuable species with just over 20% of the value for all landings within the community. Red grouper makes up 9.4% of total value for landings.

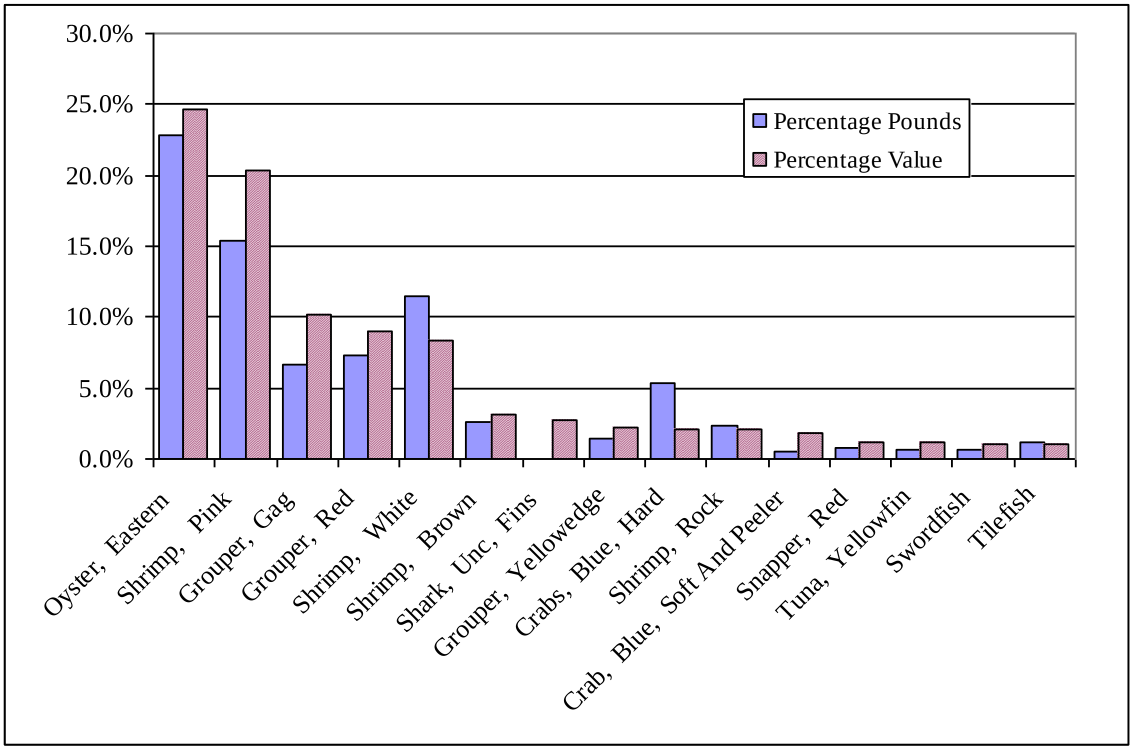

Figure 4.1.9. Percentage of pounds and value for top fifteen species landed out of total landings in Apalachicola, Florida 1999-2007 (Source: ALS SEFSC 2009).

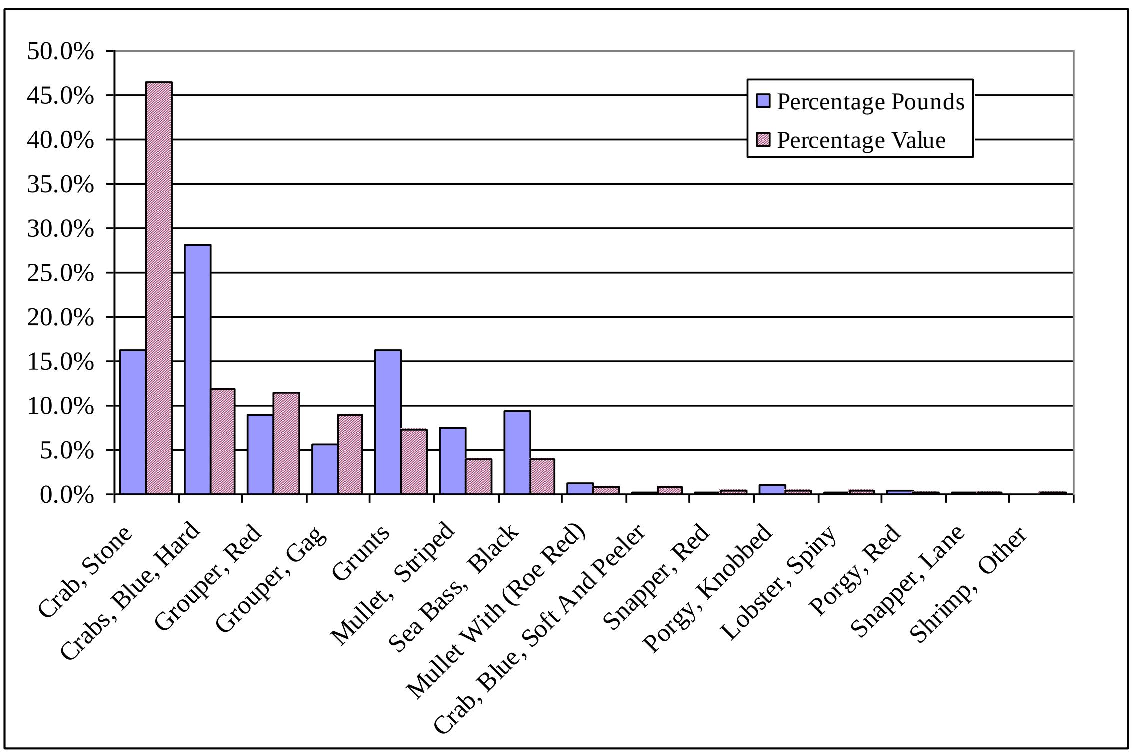

Figure 4.1.10. Percentage of pounds and value for top fifteen species landed out of total landings in Steinhatchee, Florida 1999-2007 (Source: ALS SEFSC 2009).

The community of **Steinhatchee** is smaller than both Panama City and Apalachicola, but does have fishing infrastructure devoted to commercial fishing for reef fish. Over the years, the community has seen a transition to an increasing reliance upon the recreational fishing although there were substantial landings of stone crab, grunts and red snapper in 2000 (Impact Assessment, Inc. 2005). Over the time period of 1999-2007, stone crab dominates in terms of value and blue crab is the largest in terms of pounds landed (Figure 4.1.10). Red grouper shares second in terms of value of landings with blue crab representing just over 11% of total value for both. Gag grouper ranks fourth in terms of value and is seventh in percentage of pounds landed.

Fort Myers Beach has substantial fishing infrastructure for both commercial and recreational fishing. At one time there were three commercial docking facilities with space for approximately 60 shrimp fishing vessels. These facilities offered most of the support services needed for the shrimp fleet including offloading, maintenance, fuel, ice and net repair (Impact Assessment, Inc. 2005). With the recent downturn in the shrimp fishing industry, it is not known to what extent these facilities remain or the number of vessels that continue to dock there. However, according to Figure 4.1.11 pink shrimp continue to dominate the landings and value among all species harvested for the community. Red grouper is second in terms of pounds landed and in value, but represents less than 5% of both landings and value for the community overall.

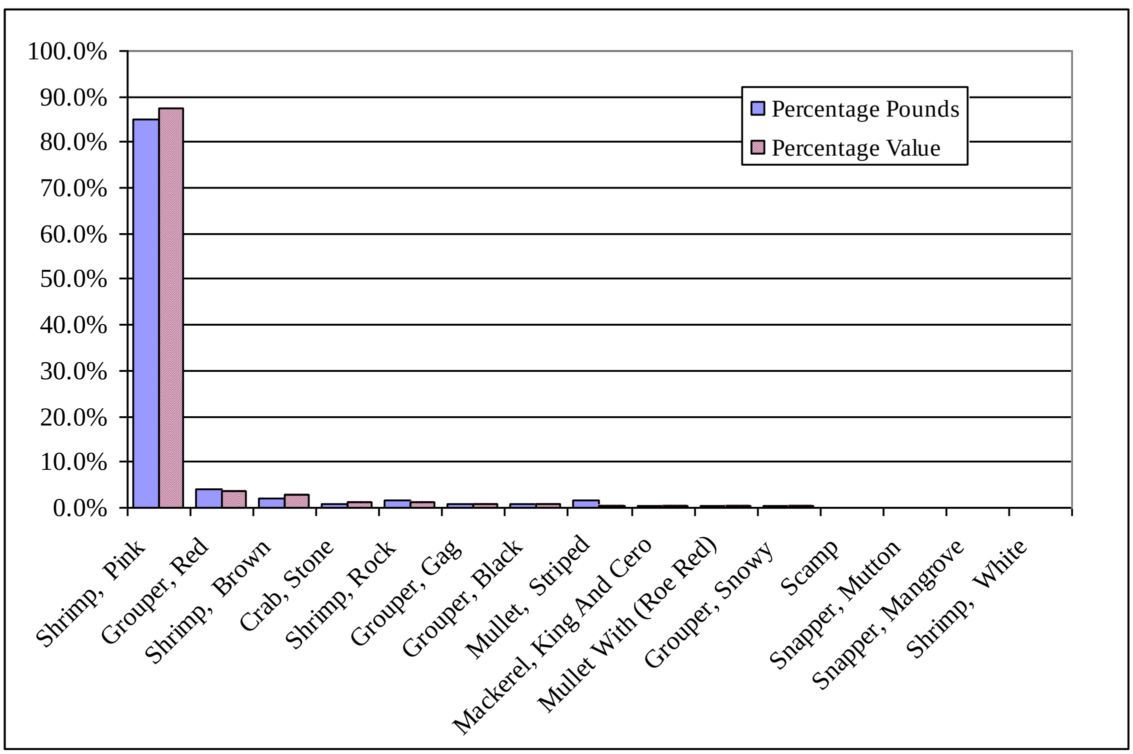

Figure 4.1.11. Percentage of pounds and value for top fifteen species landed out of total landings in Fort Myers Beach, Florida 1999-2007 (Source: ALS SEFSC 2009).

The community of **Key West** has a long history of association with the fishing industry and continues to represent an important location for both recreational and commercial fishing. While in its early history there has always been a mix of both commercial and recreational fishing, today, recreational fishing and tourism dominate the waterfront landscape. The community continues to hold on to some commercial waterfront, but much of it has moved to areas away from downtown area and primary tourism destination.

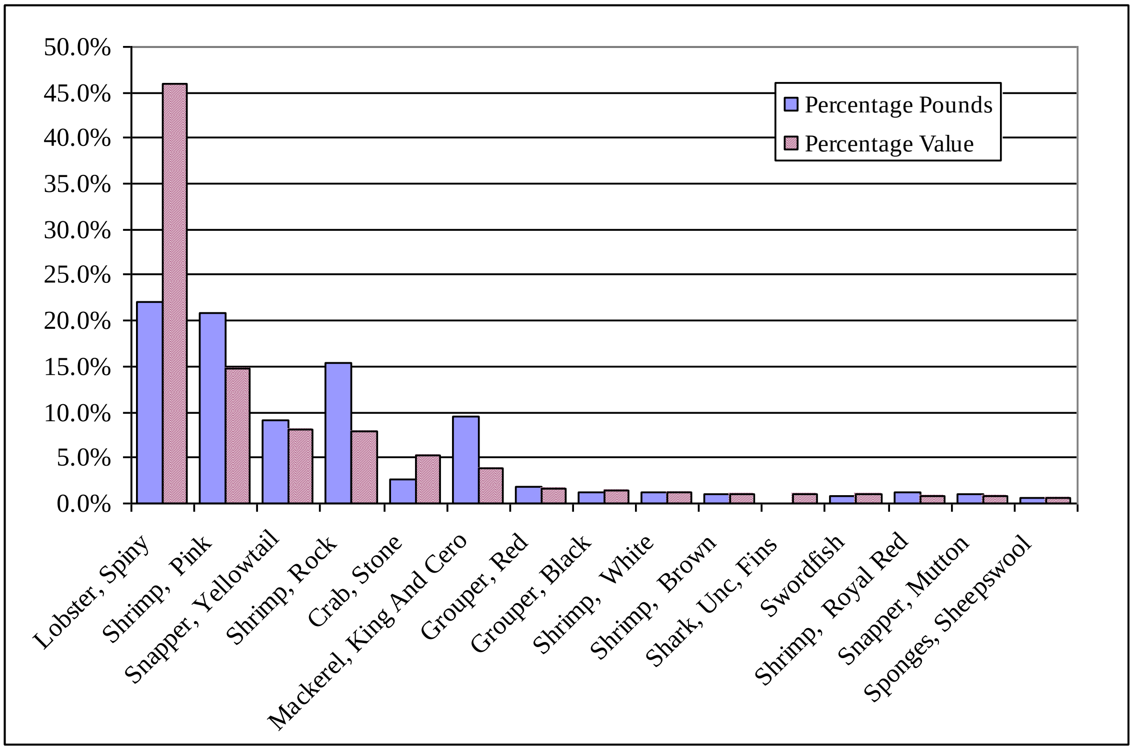

Figure 4.1.12. Percentage of pounds and value for top fifteen species landed out of total landings in Key West, Florida 1999-2007 (Source: ALS SEFSC 2009).

In terms of landings and value from 1999-2007, spiny lobster is the most valuable and highest in pounds landed. Pink shrimp is next with yellowtail snapper close behind (Figure 4.1.12). Red grouper is within the top ten most important species but contributes less than 5% in terms of landings or value for the community of Key West.

Communities with 15% of all Landings Value from Red Grouper

The additional communities in Table 4.1.3 have or had reef fish dealers with red grouper landings which constitute at least 15% of the value for all landings from 1999-2007. Several of these communities have been profiled in recent years (Impact Assessment, Inc. 2005).
In some cases, these communities are inland communities where dealers may be receiving fish trucked from the coast. While they may have relatively little in the way of fishing infrastructure, for what does exist, red grouper constitutes some component of value that meets the threshold of 15% (Table 4.1.3).

Table 4.1.3. Percent of Red Grouper Landings Value out of Total Landings Value from 1999-2007.

Community	Percentage of Red Grouper Landings Value
Bokeelia	16.7%
Cape Coral	44.9%
Clearwater	27.7%
Dunedin	18.0%
Goodland	19.7%
Gulfport	17.9%
Homosassa Springs	15.0%
Indian Shores	33.1%
Myakka City	26.1%
Nokomis	24.4%
Redington Shores	51.9%
Ruskin	15.7%
St. Cloud	26.8%
St. Petersburg	22.2%
Silver Springs	19.8%
Tallahassee	28.6%
Thonotosassa	52.7%
Treasure Island	59.3%
Venice	33.4%

While many of the communities in Table 4.1.3 are included in fishing community profiles (Impact Assessment, Inc 2005), there have been significant changes with regard to fishing regulations and the general economy since the completion of the profiles. A community's involvement with regard to fishing and/or the fishing infrastructure may have changed over time. Although these circumstances are evident, the current profiles remain the most detailed information available for most communities. Using the current profile for fishing communities in Florida, Table 4.1.4 provides a characterization of those communities with regard to their involvement in fishing.

A community's involvement in fishing is characterized as either: primarily involved, secondarily involved and tangentially involved. *Primarily-involved* are communities where the economies and primary foci of social interaction may be mixed to a greater or lesser degree, but there remains an observable collective focus on fishing and its industries. *Secondarily-involved* communities are often primarily involved in sales and service, agriculture, tourism, and/or manufacturing enterprises where commercial fishing and associated industry is important, but secondary to these other industries. *Tangentially-Involved* communities are cities and/or towns in which fishing plays a subsidiary role to other forms of economic and social activity (Impact Assessment, Inc. 2005). The communities that are highlighted in Table 4.1.4 are those that have been identified as having some involvement in the longline fishery and/or meet the criteria threshold of at least 15% of red grouper landings value out of total landings value.

Table 4.1.4. Preliminary Characterization of Fishing-Oriented Towns and Cities along the Florida Gulf Coast (Impact Assessment, Inc. 2005).

Primarily-Involved	Secondarily-Involved	Tangentially-Involved
Apalachicola	Anna Maria Island	Alva
Boca Grande	Aripeka	Anclote
Carrabelle	Bagdad	Apollo Beach
Cedar Key	Bradenton	Archer
Chokoloskee	Bradenton Beach	Bell
Cortez	Clearwater	Belleair
Crystal River	Crawfordville	Brandon
Eastpoint	Dover	Brooksville
Everglades City	Dunedin	Cantonment
Fort Myers Beach	Englewood	Cape Coral
Homosassa	Fort Myers	Captiva Island
Hudson	Fort Walton Beach	Chiefland
Inglis/Yankeetown	Freeport	Copeland
Jena/Steinhatchee	Gibsonton	DeFuniak Springs
Keaton Beach	Goodland	El Jobean
Madeira Beach	Gulf Breeze	Estero
Panacea	Lakeland	Gulf Hammock
Panama City	Lecanto	Gulfport
Panama City Beach	Lynn Haven	Hernando
Pensacola	Marco Island	Holiday
Pine Island	Mary Esther	Holmes Beach
Port St. Joe	Mexico Beach	Indian Rocks Beach
Punta Gorda	Milton	Inverness
Sopchoppy	Navarre	Lamont
St. Marks	New Port Richey	Lanark Village
Suwannee	Ozona/Palm Harbor	Largo
Tarpon Springs	Pace	Longboat Key
-	Palmetto	Lutz
-	Placida	Nokomis/ Odessa
-	Port Charlotte	North Fort Myers
-	Port Richey	Old Town
-	Ruskin	Oldsmar
-	Santa Rosa Beach	Osprey
-	Sarasota	Redington Beach
-	Shalimar	Riverview
-	Southport	Royal Palm Hammock
-	Spring Hill	Sanibel Island
-	St. Petersburg	Seminole
-	Tampa	Terra Ceia
-	Youngstown	Tierra Verde
-	-	Treasure Island
-	-	Trenton
-	-	Valparaiso
-	-	Venice
-	-	White City

The communities of Tallahassee, Thonotosassa, St. Cloud and Silver Springs, which are not listed in the above table, are inland communities and may have dealers that handle red grouper, either directly from a vessel or the vessel owner may hold a dealer's license. In some cases product may be going directly to restaurants that hold a dealer's license for both inland and coastal communities. Other communities such as Indian Shores and Redington Shores also do not appear as profiled fishing communities but are relatively close to other barrier island communities just west of St. Petersburg in Pinellas County and have sufficient landings to meet the 15% criteria of red grouper landings value. It should also be noted that some of these communities may no longer have dealers currently operating within the community.

4.2 Environmental Justice Considerations

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. This executive order is generally referred to as environmental justice (EJ).

Persons employed in the reef fish bottom longline fishery and associated businesses and communities along the Gulf coast of Florida would be expected to be affected by this proposed action. Information on the race and income status for groups at the different participation levels (vessel owners, crew, dealers, processors, employees, employees of associated support industries, etc.) is not available. County level data; however, have been assessed to ensure the most recent estimates. Because this proposed action would be expected to affect fishermen and associated industries in numerous communities along the west Florida coast, as discussed above, it is possible that other counties or communities have poverty or minority rates that exceed the EJ thresholds.

Information on the communities discussed above was examined to identify the potential for EJ concern. Specifically, the rates of minority populations and the percentage of the population that was below the poverty line were examined. The threshold for comparison that was used was 1.2 times the state average such that, if the value for the community or county was greater than or equal to 1.2 times the state average, then the community or county was considered an area of potential EJ concern. Census data for the year 2007 was used and the estimate of the minority (interpreted as non-white, including Hispanic) population was 38.7%, while 12.6% of the total population was estimated to be below the poverty line. These values translate in EJ thresholds of approximately 46.4% and 15.1%, respectively.

Based on the demographic information provided above for each county, no potential EJ concern is evident for either Pinellas or Manatee County as they fall below the thresholds with regard to poverty and percent of minorities.

However, additional communities beyond those profiled above would be expected to be affected by the actions in this proposed amendment. Because these communities have not been profiled, the absence of potential EJ concerns cannot be assumed. However, although some communities expected to be affected by this proposed amendment may reside in counties that have minority or economic profiles that exceed the EJ thresholds and, therefore, constitute areas of concern, no EJ issues have been identified or are expected to arise. No negative environmental consequences are expected to accrue to this proposed amendment. While adverse social and economic consequences are expected to accrue to fishermen in the reef fish bottom longline fleet and associated industries and communities due to the reduction of expenditures and revenues associated with an expected change in fishing behavior and harvest levels, the environmental consequences of this proposed amendment are expected to be positive. This proposed amendment is expected to reduce the take and mortality of threatened sea turtles and result in a net short term reduction in the mortality of reef fish species by the commercial reef fish fishery. Reduced mortality of these species would be expected to increase the environmental benefits these species contribute to the marine environment and the general health and condition of this environment.

4.3 Description of the Administrative Environment

Federal Fishery Management

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

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring management measures are consistent with the MSFCMA and with other applicable laws summarized in Section 10. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the states of 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 on advisory panels and through publically open council meetings, with some exceptions for discussing internal administrative matters. The regulatory process is also in accordance with the Administrative Procedures Act, in the form of “notice and comment” rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations contained within FMPs are enforced through actions of the NOAA’s Office of Law Enforcement, the USCG, and various state authorities. To better coordinate enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the MSFCMA. These activities are being coordinated by the Council’s Law Enforcement Advisory Panel and the Gulf States Marine Fisheries Commission’s Law Enforcement Committee have developed a five year “Gulf Cooperative Law Enforcement Strategic Plan - 2006-2011.”

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. Each of the five Gulf States exercises legislative and regulatory authority over their states’ natural resources through discrete administrative units. Although each agency 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. A more detailed description of each state’s primary regulatory agency for marine resources is provided in Amendment 22 (GMFMC 2004d).

5.0 BYCATCH PRACTICABILITY ANALYSIS

<u>Background/Overview</u>

Bycatch is defined in the MSFCMA as fish harvested in a fishery, but not sold or retained for personal use. The term "fish" means finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds. Therefore, turtles are fish and are bycatch because they cannot be sold or kept for personal use[10].

Guidance provided at 50 CFR 600.350(d)(3) identifies ten factors to consider in determining whether a management measure minimizes bycatch or bycatch mortality to the extent practicable. These are:

1. Population effects for the bycatch species.
2. Ecological effects due to changes in the bycatch of that species (effects on other species in the ecosystem).
3. Changes in the bycatch of other species of fish and the resulting population and ecosystem effects.
4. Effects on marine mammals and birds.
5. Changes in fishing, processing, disposal, and marketing costs.
6. Changes in fishing practices and behavior of fishermen.
7. Changes in research, administration, and enforcement costs and management effectiveness.
8. Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources.
9. Changes in the distribution of benefits and costs.
10. Social effects.

The Councils are encouraged to adhere to the precautionary approach outlined in Article 6.5 of the Food and Agriculture Organization of the United Nations Code of Conduct for Responsible Fisheries when uncertain about these factors.

Vertical line gear (i.e., bandit rigs and manual handlines) and longline gear are the primary gears used in the commercial reef fish fishery. Observer data indicate high levels of hardshell sea turtle bycatch in the bottom longline component of the fishery, relative to the vertical line component.

The 2005 BiOp (NMFS 2005) included a reasonable and prudent measure (RPM) requiring NMFS to ensure any caught sea turtle or smalltooth sawfish is handled in such a way as to minimize stress to the animal and increase its survival rate. The Council addressed this RPM in Amendment 18A to the Reef Fish FMP (GMFMC 2005). Regulations were implemented requiring sea turtle release gear onboard reef fish-permitted vessels when fishing to facilitate the safe release of any sea turtles or smalltooth sawfish. In addition, vessels with commercial and

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[10] Memo from S. Rauch to J. Lecky, October 10, 2008.

for-hire reef fish vessel permits are required to possess specific documents providing instructions on the safe release of incidentally caught sea turtles or smalltooth sawfish with hook-and-line gear.

The 2005 BiOp also included an RPM requiring better data collection from the reef fish fishery on sea turtle and smalltooth sawfish takes, including implementation of a reef fish observer program. Mandatory observer coverage in the commercial Gulf reef fish fisheries was implemented via Amendment 27 to the Reef Fish FMP.

The reef fish fishery currently is regulated through measures such as quotas, size limits, bag limits, and seasonal closures. These measures are intended to protect reef fish during spawning and to limit fishing mortality, the size of fish targeted, the number of targeted fishing trips, and/or the time fishermen spend pursuing a species. However, these management tools have the unavoidable adverse effect of creating regulatory discards, which reduces yield from the directed fishery.

In this amendment, the Council is considering the practicability of taking action to minimize sea turtle bycatch by the bottom longline component of the reef fish fishery. An additional indirect effect of these measures would be to reduce reef fish regulatory discards.

Sea Turtles

See Section 3.2.2 for a detailed description of sea turtles in the Gulf.

A 2005 BiOp (NMFS 2005) conducted for the Gulf reef fish fishery found mortalities of endangered and threatened species are uncommon from gear used in the reef fish fishery and were not likely to jeopardize the continued existence of those species. The BiOp indicated recreational anglers infrequently take loggerhead, leatherback, Kemp's ridley and green sea turtles. During 2001-2003, the BiOp estimated 113 hardshell sea turtles were taken by longlines and 87 hardshell sea turtles were taken by vertical lines. Individual estimates were not calculated for leatherback sea turtles, but were a combined estimate of nine leatherback sea turtles for the reef fish fishery.

In September 2008, NMFS released a report examining observed sea turtle takes by the bottom longline component of the reef fish fishery from July 2006 through December 2007 (NMFS-SEFSC 2008). Data were collected in the course of two observer programs sampling overlapping portions of the reef fish fishery. A total of 18 hardshell sea turtle captures were observed, at least 16 of which were loggerhead sea turtles (two were unidentified hardshell sea turtles). Subsequently, 2008 observer data became available adding three captures to the total (two loggerhead sea turtles, one unidentified hardshell sea turtle). In April 2009, the SEFSC released an update to the NMFS-SEFSC (2008) report, which included revised take estimates based on revised effort and observer data, and an additional electronic monitoring program. Takes for July 2006-December 2008 were estimated at 967 hardshell sea turtle takes over 30 months for the longline component of the reef fish fishery (NMFS-SEFSC 2009; see Section 1.1 for an explanation of the estimate used). New bycatch estimates for the reef fish bottom longline component are believed to represent the best available information at this time on hardshell sea turtle bycatch for the reef fish fishery.

Differences between the new longline observer data and the information summarized in the 2005 BiOp may be because: (1) sea turtle catch rates in the bottom longline sector are higher on average now than they were when the reef fish fishery was previously observed, (2) reef fish observer coverage levels to date have been too low for any accuracy or precision in take levels, (3) sea turtle catch rates have been and continue to be highly variable from year to year, and/or (4) estimated sea turtles takes were under-reported in logbook data. Some fishermen have indicated sea turtle bycatch is a relatively new problem in this fishery. Sea turtle takes in other longline fisheries are highly variable from year to year (e.g., annual sea turtle bycatch in the HMS pelagic longline fishery). Thus, bycatch in the reef fish fishery probably is also highly variable from year to year.

Loggerhead sea turtle takes observed in the bottom longline component of the reef fish fishery included both later-stage sexually immature sea turtles and mature sea turtles. These life history stages are very important for population recovery because their reproductive value is high. Satellite telemetry studies of adult female loggerhead sea turtles indicate the importance of the west Florida shelf as benthic foraging habitat (Schroeder et al. manuscript in prep). For the past 20 years, FWRI has coordinated a detailed sea turtle nesting-trend monitoring program. Loggerhead sea turtle nests counted annually at core index nesting beaches in Florida from 1989 through 2008 indicate a declining trend in loggerhead sea turtle nesting (FWRI 2008; Witherington et al. 2009). Witherington et al. (2009) have argued the observed decline in the annual counts of loggerhead sea turtle nests on Index and Statewide beaches in peninsular Florida can best be explained by a decline in the number of adult female loggerhead sea turtles in the population.

Reef Fish

As reported in logbooks, 77% of fish harvested with bottom longline gear were groupers and tilefishes (NMFS 2009a). The actions in this amendment are most likely to affect SWG. Red grouper make up 78% of commercial longline SWG landings by weight (NMFS 2009a); therefore, red grouper will be discussed as the representative reef fish species.

The 2002 red grouper stock assessment used release mortality rates of 33% and 90% for the commercial vertical line and longline gears, respectively. The next red grouper stock assessment, completed in 2007, attempted to determine release mortality rates by depth (SEDAR 12 2007). However, not enough information was available; size-at-depth data were available, but the relationship between discard mortality and depth was less clear. Additionally, analyses demonstrated no difference in median red grouper length over time by gear or depth. Therefore, discard mortality was not calculated using a depth-specific release mortality rate.

Estimates of red grouper release mortality were collected from seven data sources. Data were designated as either pre-release mortality or post-release mortality. Pre-release mortality data were observations of fish condition on the surface at the time of release, usually a minimum estimate of release mortality. Post-release mortality data were observations of fish from cages and tag-recapture studies, usually reflecting a higher rate of release mortality than that observed from surface releases. Based on a review of the data collected from these studies, a 10% release mortality rate was estimated for the recreational, vertical line, and trap components and a 45% release mortality rate was estimated for the longline component (SEDAR 12 2007).

Annual commercial red grouper dead discards were calculated by gear type. Before implementation of a minimum size limit in 1990, discards were assumed to be zero. No significant difference was found in discard rates among years. Vertical line and trap fishery discard rates calculated from logbook reports were similar to bottom longline and observer discard rates. In contrast, longline discard rates from logbook reports were an order of magnitude less than NMFS bottom longline survey data or observer data. To better estimate longline discards, the vertical line red grouper discards-to-landings ratios were multiplied by the longline landings in each area and targeting stratum. Discards in numbers were next estimated in terms of weight by multiplying the estimated number of discards by the derived age composition. Numbers at age were then multiplied by weight at age to estimate total dead discards by weight for each sector and/or gear type.

Since the implementation of the 20-inch minimum size limit in 1990, commercial dead discards have averaged 12% of the commercial removals and 73% of the total dead discards of red grouper. During this time, an average of 87% of the total commercial dead discards was attributed to the longline component of the fishery and an average of 12% was attributed to the vertical line component of the fishery. Annually, the commercial red grouper dead discards average 600-900 thousand pounds.

In the eastern Gulf, red snapper, greater amberjack, gray triggerfish, and vermilion snapper may be discarded due to reef fish regulations. Vermilion snapper are not overfished or undergoing overfishing (SEDAR 9 2006) and bycatch is not expected to jeopardize the status of this stock. Greater amberjack (SEDAR 9 2006) and red snapper (SEDAR 7 2005) are overfished and undergoing overfishing. Greater amberjack release mortality is estimated to be fairly low, ranging from 10-20%. Release mortality is higher in the commercial greater amberjack sector than the recreational greater amberjack sector because minimum size limits differ. Gray triggerfish release mortality is also relatively low (1.5%, SEDAR 9 2006). Because greater amberjack and gray triggerfish are generally caught in the water column and grouper are benthic, bycatch of greater amberjack and gray triggerfish is relatively low on grouper trips and likely not greatly affected by changes in longline management measures. In contrast, red snapper abundance has been increasing in the eastern Gulf over the past ten years and fishermen have indicated they are discarding more red snapper. Most commercial grouper fishermen in the eastern Gulf were allocated few red snapper IFQ shares and are unable to retain large quantities of red snapper caught when fishing for grouper. Bycatch is a significant source of mortality in the red snapper sector of the fishery, resulting in the Council approving actions in Amendment 27/14 to reduce directed fishery bycatch (see below). The status of other SWG species, such as black grouper and scamp, are unknown. Most SWG trips target red, gag, and black grouper, and capture other SWG incidentally. Regulatory discards are not known to be significant for these species, because many (e.g., yellowmouth grouper, rock hind, and red hind) have no or small minimum size limits.

Other Bycatch

Other species incidentally encountered by the reef fish fishery include mammals and sea birds. The Gulf commercial reef fish fishery is listed as a Category III fishery in NMFS' List of Fisheries (73 FR 73032, December 1, 2008). This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to one percent of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population. The 2005 BiOp also estimated eight smalltooth sawfish were caught and released by the commercial and recreational components of the reef fish fishery during 2001-2003 (NMFS 2005). Actions in Amendment 18A addressed the RPMs for smalltooth sawfish.

Three primary orders of seabirds in the Gulf are Procellariiformes (petrels, albatrosses, and shearwaters), Pelecaniformes (pelicans, gannets and boobies, cormorants, tropic birds, and frigate birds), and Charadriiformes (phalaropes, gulls, terns, noddies, and skimmers) (Clapp et al. 1982; Harrison 1983). Several other species of seabirds also occur in the Gulf, and are listed as threatened or endangered by the U.S. Fish and Wildlife Service, including: piping plover, least tern, roseate tern, bald eagle, and brown pelican (the brown pelican is endangered in Mississippi and Louisiana and delisted in Florida and Alabama). Human disturbance of nesting colonies and mortalities from birds being caught on fishhooks and subsequently entangled in monofilament line are primary factors affecting sea birds. Oil or chemical spills, erosion, plant succession, hurricanes, storms, heavy tick infestations, and unpredictable food availability are other threats. No evidence exists that the directed grouper fisheries adversely affect seabirds.

Practicability of current management measures in the reef fish fishery relative to their impact on bycatch and bycatch mortality.

The Council and NMFS took action in Amendment 18A to the Reef Fish FMP (effective September 8, 2006) to comply with the RPM that any sea turtle or smalltooth sawfish taken in the reef fish fishery is handled in such a way as to minimize stress to the animal and increase its survival rate. Regulations were implemented requiring sea turtle release gear be onboard reef fish-permitted vessels when fishing to facilitate the safe release of any incidentally caught sea turtles or smalltooth sawfish. In addition, vessels with commercial and for-hire reef fish vessel permits are required to possess specific documents providing instructions on the safe release of incidentally caught sea turtles or smalltooth sawfish. RPMs also required better data collection from the reef fish fishery on incidental takes of sea turtles.

Measures in Amendment 27/14 (effective June 1, 2008) included requiring the use of circle hooks, venting tools, and dehooking devices while harvesting reef fish. These gears can reduce bycatch mortality of reef fishes by selectively reducing the capture of undersized fish or reducing the release mortality of fish after capture. Venting tools and dehooking devices may also increase survival of released fish by improving handling techniques and reducing time a fish spends at the surface. Because mouth gape size for both gray triggerfish and vermilion snapper is small, circle hooks will likely reduce the capture of both sub-legal and legal fish. Pamphlets and prominently displayed placards will increase awareness of the importance of reducing bycatch and educate anglers on proper handling techniques for releasing fish. In one study, circle hooks reduced catch of sea turtles by 71-90% depending on bait type (Watson et al. 2005), while in another study sea turtle catch with circle hooks was not significantly different than for J-hooks (Kiyota et al. 2004). However, both studies found circle hooks are more likely to hook in the mouth than the gut, which should increase the survival of sea turtles that are captured.

Amendment 30B (effective May 18, 2009) lowered the commercial red grouper minimum size limit, which should significantly reduce commercial discards. Decreasing the size limit will increase catch rates and allow the commercial quota to potentially be met faster. Mid-season quota closures may also occur for the shallow water grouper sector if the gag commercial quota is reached quickly. These quota closures often result in shifting of fishing effort to other species. This shift in effort could negatively impact reef fish stocks not currently constrained by annual quotas. The magnitude of this impact would depend on the length of the closure and the amount of effort shifting that occurs, and will be eliminated when the grouper and tilefish IFQ program is implemented in January 2010.

Alternatives being considered to minimize sea turtle bycatch

This amendment considers several management measures to reduce the incidental take of sea turtles by the bottom longline component of the reef fish fishery in the eastern Gulf. See Section 6 for more details on the potential environmental impacts of these actions.

One way to reduce takes is to alter gear or fishing behavior in such a way as to reduce the probability of a sea turtle being hooked. Results from two studies found fish baits had significantly lower catch rate than squid baits (Kiyota et al. 2004; Watson et al. 2005). Captive sea turtle experiments also found loggerhead sea turtles were more likely to swallow whole squid which had tough muscle and were difficult to bite, versus fish that were bitten off in small pieces (Kiyota et al. 2004). This information suggests modifying baits in the bottom longline component of the reef fish fishery has the potential of reducing hooking incidents with sea turtles. On the other hand, there is little information to suggest the magnitude of that potential, therefore the Council chose not to select such an action for implementation.

The industry uses a range of mainline lengths, which typically depends on vessel size. Soak time is dependent in part on mainline length as a longer line will take longer to deploy and retrieve. In addition, bottom longline gear that has longer gangions typically have longer soak times. To prevent sea turtles from potentially drowning, mainline length appropriate for an approximate 60 minute soak time may be an option. The normal voluntary dive duration of a foraging loggerhead sea turtle is 15-30 minutes; the maximum dive duration is 60 minutes (Spotila 2004). However, a voluntary 60-minute dive may have a different physiological effect than a 60-minute forced submergence. As with bait types, there is little way to estimate the actual potential reduction of restricting mainline length fished, plus it would be difficult to enforce, therefore the Council chose not to select such an action for implementation.

Average soak time (defined as the time the last hook enters the water to the time the first hook is hauled back) of the gear is three hours (NMFS 2005; Hale et al. 2007). A limit on the number of hooks could also reduce the time of retrieval of the mainline and dehooking the catch, resulting in reduced soak time. By reducing mainline length, gangion length, or hooks fished, fishermen could reduce the time gear is submerged, potentially reducing sea turtles takes and bycatch mortality from drowning. Similar to the above, there would be limited ways to enforce such a requirement; therefore, the Council did not select such an action for implementation.

Another way to reduce the chance of sea turtle interactions is to reduce effort in the fishery. Effort could be reduced by prohibiting longline gear in certain areas, depths, or months, or some combination of the three. The more abundant sea turtles are in a given area and the higher the fishing effort in that area, the greater the probability a sea turtle will be incidentally caught by the gear. For example, most observed sea turtle takes occurred on fishing trips west of the Tampa Bay area, all but one sea turtle take was on a set at 50 fathoms or less, and 76% of sea turtles takes occurred from June through August (NMFS-SEFSC 2009). Most of the longline fishing effort is conducted in these places and at these times.

Effort could also be reduced by limiting the number of vessels permitted to use longline gear. Endorsements would be granted based on some minimum level of landings during a chosen qualifying time period. Fewer vessels fishing longline gear should result in fewer interactions with sea turtles. Working from the assumption turtle interactions are directly correlated with effort, reducing effort was the focus of the Council's choices for actions for implementation. The following practicability analysis discusses the possible effects from both the non-selected and preferred actions considered by the Council.

Practicability Analysis

Criterion 1: Population effects for the bycatch species

A recent SEFSC observer analysis indicates the bottom longline component of the reef fish fishery in the Gulf has exceeded the number of hardshell sea turtle takes authorized in the 2005 BiOp (NMFS 2008a). Sea turtles incidentally caught by this component of the fishery are late-stage sexually immature juveniles and mature adult loggerheads which have a high reproductive potential. Loggerhead sea turtle nests counted annually at core index nesting beaches in Florida have been declining in recent years, and Witherington et al. (2009) has argued this as an indication the population is decreasing. Further information on sea turtle population abundance will be included in the 2009 BiOp. Satellite telemetry studies of adult female loggerhead sea turtles indicate the importance of the west Florida shelf as benthic foraging habitat. Strandings along the west Florida coast also indicate the importance of the shelf as foraging habitat for loggerhead, Kemp's ridley, hawksbill, leatherback, and green sea turtles. Measures in this amendment to reduce sea turtle takes include modifying fishing gear and behavior and reducing effort. Each measure could reduce the chance of interaction between bottom longline gear and sea turtles, and some may also reduce mortality of captured sea turtles.

The bycatch minimization methods being considered in this amendment are expected to also affect reef fish stocks. Changes in bait, mainlines, gangions, and hooks per vessel would likely reduce efficiency in capturing target species. Reductions in effort should reduce landings and in turn reduce both fishing and discard mortality. Overall, actions in this amendment would benefit both sea turtles and reef fish.

Criterion 2: Ecological effects due to changes in bycatch (effects on other species in the ecosystem)

The relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict with any accuracy. Loggerhead sea turtles are carnivorous, with strong beaks for consuming pelagic invertebrates (e.g., jellyfish and crab larvae) as juveniles, and benthic invertebrates (e.g., crabs, clams, and soft corals) as mature adults (Spotila 2004). Mature adult loggerhead sea turtles are classified as generalist feeders, but showed a greater preference for benthic species in diet studies, probably because benthis prey is easily captured. Consequently, forage and competitor species abundance could decrease in response to an increase in sea turtle abundance. Changes in the catch of reef fish may or may not be large enough to affect prey species in the ecosystem. As reef fish stocks rebuild or increase, in part due to lowered catches, there would be an expected increase in predation on available prey.

Criterion 3: Changes in the bycatch of other species of fish and invertebrates and the resulting population and ecosystem effects

Population and ecosystem effects resulting from changes in the bycatch of other species of fish and invertebrates are difficult to predict. Snappers, greater amberjack, gray triggerfish, and other reef fishes are commonly caught in association with SWG. Many of these species have been or are undergoing overfishing, as detailed above. Regulatory discards significantly contribute to fishing mortality in all of these reef fish fisheries, except gray triggerfish and vermilion snapper. No measures are proposed in this amendment to directly reduce the bycatch of other reef fish species. However, any reduction in effort in the bottom longline component of the reef fish fishery could reduce regulatory discards of all species. It is also possible that if fishers convert to bandit rig, there could be an increase in discards (e.g., gag).

Criterion 4: Effects on marine mammals and birds

The effects of current management measures on marine mammals and birds are described above. Bycatch minimization measures evaluated in this amendment are not expected to significantly affect marine mammals and birds. No information exists to indicate marine mammals or birds rely solely on reef fish or sea turtles for their main food source.

Criterion 5: Changes in fishing, processing, disposal, and marketing costs

For a more complete discussion of the expected changes in fishing costs associated with the various management actions, see Sections 3 and 6.

A change in bait type may or may not change fishing costs. Some fish species, such as menhaden, are less expensive than squid. Other species, such as sardines, are more expensive.

Closing an area or time to longline fishing could have a substantial impact on longline fishermen. Vessels may need to travel farther to reach open fishing grounds, requiring more time at sea, more fuel, and higher operational costs. If reef fish concentrations are lower in the open areas, these requirements would increase even more. Some vessels may be too small to make trips to deeper waters and would need to leave the fishery. Conversely, if many longline vessels change to vertical line fishing, user conflicts with existing vertical line commercial fishermen and recreational fishermen may result.

Implementation of longline endorsements may require a fee for processing the endorsement. Losses of varying amounts would be incurred by fishermen who did not receive endorsements, depending on their level of dependence on the longline component of the fishery. Some vessels not receiving an endorsement may switch to vertical line gear if economically feasible.

The costs of retrofitting vessels with vertical line gear and the loss of product as a result of lower catch rate may have significant impacts upon fish houses that own fleets of vessels. Some industry representatives have suggested that with current economic conditions and other regulatory actions, the alternatives in this action may force them out of business (B. Spaeth and K. Bell, personal communication). Some within the fishery see these actions as having possible dramatic impacts not only affecting the longline component of the reef fish fishery, but also the bait fishery that provides a considerable amount of bait to longline vessels. The anticipated impacts would go beyond vessels and have impacts on wholesale and retail markets and restaurants who would need to find substitutes for the lost product.

Any changes of gear would require purchasing replacement items. Mainlines, gangions, and hooks may need to be replaced under different alternatives.

Criterion 6: Changes in fishing practices and behavior of fishermen

All bycatch minimization measures proposed are expected to change fishing behavior and practices. A change from squid to fish bait may necessitate changes in fishing practices because fish bait does not last as long. As a result, fishermen may make more sets, increasing the potential for bycatch.

If the areas where fishing effort is currently concentrated are closed, some vessels may be too small to make trips to more distant or deeper waters and would need to leave the fishery. Some fishermen that currently use bottom longline gear may switch to vertical line gear if areas, depths, or months are closed to longlining. The amount of potential effort shift to vertical line gear cannot be estimated at this time. Fishermen may also redirect their effort to a different fishery, although most other fisheries are not as widespread as the Gulf reef fish fishery.

Changes in fishing practices with issuance of endorsements would be similar to changes due to closures listed above for individuals who would not receive an endorsement. Individuals who did receive an endorsement might increase fishing effort, potentially bringing total effort back to previous levels over time. Issuance of longline endorsements has some support within the industry as a means to reduce interactions with sea turtles and was suggested at a recent workshop. Some industry representatives indicated that there are permit holders who might be willing to switch their gear type and some who already have. However, the total number of permit holders willing to do so is not known. Furthermore, how many permit holders would have difficulty making the transition because of cost involved or the necessary skills needed is not known either.

There may be a reduction in the labor force required in the fishery if many vessels change from longline to vertical line gear. Vertical line vessels routinely have fewer crew members on board than longline vessels. Another difficulty in switching to vertical line gear is that this component requires an entirely different set of skills for the captain. Setting out a longline over several miles takes a different skill set than anchoring a vessel in a specific location. Captains of vertical line vessels must be adept at setting an anchor such that the tide and currents will place the vessel in the exact location near the desired bottom type.

The industry has submitted proposals to test various gear modifications, including some suggested in this amendment, to determine if they actually reduce the interactions with sea turtles. Industry representatives have indicated that gear modifications would be preferred to other actions within this document. On the other hand, no information is available to quantify the potential benefits of gear modifications.

Criterion 7: Changes in research, administration, and enforcement costs and management effectiveness

Enforcement of bait requirements for longline gear would be difficult because bait type could only be determined before fishing occurred, and therefore, before a violation occurred. Because few studies have been conducted on the differences in sea turtle takes among baits for bottom longlines, more research would be necessary to determine if this action could in fact reduce bycatch of sea turtles.

If longline gear was prohibited in certain areas or at certain times, enforcement would need to increase accordingly. However, enforcement would be complicated because vertical line fishing would be allowed in areas and at times when bottom longline fishing was prohibited. Existing VMS requirements would aid enforcement of all types of time or area closures.

If endorsements are implemented, permit histories would need to be evaluated and an appeals process developed for those fishermen who question the accuracy of their landings. However, this action should provide a long-term benefit to the administrative environment by identifying those fishermen who participate in the longline component of the reef fish fishery if needed for future actions.

Restrictions on gear may increase enforcement costs slightly, but would be treated similarly to other gear restrictions in other fisheries. No studies have been conducted on the impact of mainline length, gangion length, or number of hooks on sea turtle takes by bottom longline gear; thus, more research would be necessary to determine if these restrictions had any effect on bycatch of sea turtles. Restricting the number of hooks aboard a vessel would be the most enforceable of the various options.

Criterion 8: Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources

The economic and social impacts on fishermen are expected to be negative. Fishermen could have difficulty diversifying and targeting other species if they are prevented from harvesting species they harvested in the past due to new regulations that limit participation in a specific fishery. Even though an individual fisherman may have limited participation in a specific fishery, income from that fishery combined with income from other fisheries may make it possible for him to make a living from fishing. If new regulations prevent some fishermen who currently fish using longline gear from participating in longline fishing, they may not be able to make up for the loss in income by switching gear or targeting other species.

The social value of sea turtles is indeterminate, but expected to be positive. Regardless of the effect on species recovery, continued increased take of these sea turtles can be expected to lead to societal displeasure. Although fishermen and associated constituents also value sea turtles, and society at large also values fishermen and the products and services they provide, addressing sea turtle takes and the needs of fishermen requires compromise. Fishermen may be willing to change some fishing behaviors to mitigate the interactions with sea turtles. Thus actions with industry support would be expected to have fewer social impacts.

The actions in this amendment could also reduce directed catch and bycatch of species undergoing overfishing, thereby providing a net benefit to stock recovery, which will positively affect the social and economic value of fishing activities. It should be noted, however, that these benefits may be delayed and not be available to all current individuals and entities that operate in the fisheries and associated businesses and communities.

Criterion 9: Changes in the distribution of benefits and costs

The actions in this amendment would affect the longline sector of the reef fish fishery directly, and the vertical line sector indirectly. Increased costs associated with new regulations may be too high for some longline operations to remain profitable. For this and other economic reasons, some longline fishermen may switch to vertical line gear. This in turn would increase the chance of user conflicts with current vertical line fishermen. In addition, the cost of converting gear may be prohibitive for smaller operations.

Issuance of endorsements would create the largest change in distribution of benefits among current longline fishermen because some individuals would be able to continue their current method of fishing (within the constraints of other restrictions selected) while others would not. Commercial fishermen who actively harvested grouper and tilefish for all of the qualifying years would have a greater likelihood of receiving an endorsement than those that had reduced landings for a particular year for reasons such as family health issues, equipment problems, etc., because a year with lower harvest levels would bring down their total average landings.

Criterion 10: Social effects

Because bycatch in this instance is a threatened species, the Council and NMFS are mandated to ensure that the level of interactions would not endanger the species further and to reduce the number of interactions to a level that is acceptable. Although, some measures within the amendment would have negative social impacts upon the fishing industry and communities, both the MSFCMA and ESA are national mandates. Actions within this amendment may be capable of reducing those interactions to levels that are acceptable and practicable. Measures that reduce bycatch to the extent practicable may reduce waste and benefit stock recovery, thereby resulting in net social benefits in the long term. Actions in this amendment that reduce sea turtle interactions and sea turtle mortality when interactions occur would have the greatest social benefit as long as they can balance the negative impacts upon the industry through alternatives that minimize those impacts or provide long term social benefits. It is assumed that because both Acts have Legislative support and have withstood judicial review over the years that protection of these species has benefits for society in the long term.

CONCLUSIONS

Analysis of the ten bycatch practicability factors indicates positive biological impacts would be associated with reducing sea turtle bycatch and bycatch mortality in the reef fish fishery. Reducing discards and discard mortality rates of reef fish would result in less forgone yield. Changing bait or gear would be the least expensive and easiest options for reducing bycatch. Unfortunately, few studies exist that show these actions would have a significant effect on the level of interaction between bottom longline gear and sea turtles. Actions to restrict the use of longline gear by area, depth, and season, along with limiting the number of vessels, and restricting the number of hooks that can be fished would result in a clear decrease in longline effort, and thereby, a clear decrease in potential for interactions of sea turtles with longline gear. However, these actions have the greatest economic burden on the industry.

The Council weighed the benefits of reducing bycatch against the negative economic effects imposed on the reef fish fishery. The Council considered the practicability of implementing the bycatch minimization measures discussed above with respect to the overall objectives of the Reef Fish FMP, the MSFMCA, and the ESA.

6.0 ENVIRONMENTAL CONSEQUENCES

6.1 Action 1: Allow or Disallow Squid Baits in the Bottom Longline Component of the Reef Fish Fishery

6.1.1 Direct and Indirect Effect on the Physical Environment

Preferred Alternative 1 would not change how the bottom longline component uses baits; therefore, this alternative would not affect the physical environment relative to current conditions. However**, Alternative 2** prohibits the possession of squid or squid parts on a vessel that has reef fish and longline gear aboard, which could impact the physical environment by changes in fishing effort if implemented. This action could impact fishing effort by increasing or decreasing the number of sets needed to obtain the targeted catch. For example, if CPUE was lower due to using finfish versus squid or squid parts for bait then bottom longline fishers probably would increase fishing effort. If there is an increase in effort to achieve the targeted catch, then the physical environment could be negatively impacted. For example, bottom longline gear causes damage to the benthic substrate particularly when weights, hooks, or gangions drag or become entangled with the substrate. Further information on the impacts of bottom longline and vertical line fishing gear can be found in sections 6.2.1.

Limiting the use of squid or squid parts, **Alternative 2,** in the bottom longline component may cause a shift in effort, if CPUE of targeted catch is lower. However, an effort shift in the bottom longline component of the reef fish fishery due to this restriction is not as likely to occur with implementation of this action compared to other actions and alternatives in this amendment. However, if effort did shift from bottom longline gear to vertical line gear due to implementation of these alternatives, then less damage to the physical environment may occur.

6.1.2 Direct and Indirect Effects on the Biological/Ecological Environment

This action could have direct effects on the biological and ecological environment. Direct effects of the Gulf reef fish fishery on hardshell sea turtles occur when they interact with fishing gear resulting in the incidental capture, injury, or mortality. These alternatives could reduce interactions and take of both hardshell sea turtles as well as targeted reef fish species.

Preferred Alternative 1 (no action) leaves the existing types and sizes of baits used in the bottom longline component of reef fish fishery unchanged. Cut squid has typically been used as preferred bait by the bottom longline component of the reef fish fishery due to its ability for staying on a circle hook, especially at deeper depths (Pingguo 1996). Whole squid are typically not used as bait, due to cost (R. Spaeth, personal communication). Instead, squid wings from the Humboldt squid are used as bait, because they are more economical, available in bulk orders, 100% usable (i.e., no pen or ink to remove), and easily cut to the preferred size (G. Brooks and R. Spaeth, personal communication). Cut pieces of finfish such as mackerel, Atlantic thread herring, and mullet when economically priced and available are also used for bait in the bottom longline component of the reef fish fishery (G. Brooks and R. Spaeth, personal communication).

Alternative 2 prohibits squid and squid parts in the bottom longline component of the reef fish fishery unless the gear is stowed appropriately (see 50 CFR 622.34 (k)(4)(i) for the definition). Prohibiting the possession of squid or squid parts in the bottom longline component could directly impact CPUE of the targeted species, due to bait loss of dead finfish versus the more flexible squid and squid parts that stay on the hook better during long soak times. These biological and ecological impacts could also be due to the targeted species preference for dead squid bait over other dead finfish species.

Squid and squid parts are one of the factors that could affect the frequency of hardshell sea turtles becoming incidentally hooked. When observers documented hardshell sea turtle takes and bait, squid was identified 38% of the time takes were recorded (NMFS-SEFSC 2008; 2009). Additionally, when squid was identified as the bait loggerhead sea turtles were hooked in beak, jaw, or roof of their mouth 88% of the time. This suggests that loggerhead sea turtles were pursuing the squid bait and becoming hooked.

Loggerhead sea turtles are carnivorous with strong beaks for consuming pelagic invertebrates (e.g., jellyfish and crab larvae) as juveniles and benthic invertebrates (e.g., crabs, clams, and soft corals) as mature adults (Spotila 2004). Diet studies were completed on dead loggerhead sea turtles stranded on the beach from the northwestern Gulf. Mollusks (e.g., clams and whelks) were the third highest-ranked prey item and had a higher occurrence in more loggerhead sea turtles' digestive tracts than other prey items throughout the season (Plotkin et al. 1993). Fish and shrimp were found in lower abundance, suggesting these prey items may be less frequently encountered or not preferred by loggerhead sea turtles.

Laboratory studies on feeding behavior of loggerhead sea turtles found when whole dead finfish and whole dead squid were used as bait, loggerhead sea turtles preferred squid over finfish; and when dead finfish were used on hooks it resulted in reducing hooking incidents of loggerhead sea turtles (Kiyota et al. 2004; Stokes et al. 2006). The Stokes et al. (2006) feeding study of captive loggerhead sea turtles used three size classes (1.5, 1.8, and 2.1 ft. carapace length), finding all three sizes of loggerhead sea turtles were less likely to ingest hooks baited with finfish (i.e., sardines) than squid. The largest loggerhead sea turtle used in the previous experiment was 2.1 ft. carapace length. This size hardshell sea turtle was the smallest in the range (i.e., 2 to 5 ft. carapace length) of hardshell sea turtles takes documented by observers in the bottom longline component of the reef fishery (NMFS-SEFSC 2008; 2009). Investigators suggest results were due to differences in bait texture and behavioral differences in loggerhead sea turtle feeding (Stokes et al. 2006). Researchers suggest captive loggerhead sea turtles were more likely to become hooked by swallowing whole squid which had flexible, but tough texture, versus finfish baits which were bitten off in smaller pieces, avoiding the hook (Stokes et al. 2006).

Kiyota et al. (2004) completed field experiments on loggerhead sea turtle incidental hooking rates with various types of bait in the pelagic longline fishery. Results from these studies found finfish baits had significantly lower catch rate of loggerhead sea turtles than squid baits. The previous study did not state the size or age of the loggerhead sea turtles encountered. Watson et al. (2005) also completed studies on the pelagic longline fishery and documented an 85% reduction in loggerhead sea turtle catch when circle hooks with mackerel were used and a 71% reduction when mackerel bait and J hooks were used. This information suggests that implementation of **Alternative 2** could have positive biological/ecological effects on hardshell sea turtles, by reducing hooking incidents with loggerhead sea turtles in the bottom longline component (NMFS 2008b). For further discussion of hardshell sea turtle biological and ecological impacts see section 6.2.2.

6.1.3 Direct and Indirect Effects on the Economic Environment

Preferred Alternative 1, the no action alternative (status quo), would not require a specific type of bait in the bottom longline component. Under **Alternative 1**, bottom longline fishermen could maintain the current flexibility in their bait selection. Therefore, the status quo alternative is not expected to affect bait or baiting costs, fishing effort, landings, or fishing behavior and, as a result, no adverse economic effects are anticipated to result in the short term from the implementation of **Alternative 1**. However, if bait type is an important factor in the interaction between hardshell sea turtles and bottom longline gear, a delay in the implementation of measures to reduce these interactions could lead to more restrictive management measures at a later date, resulting in greater adverse economic impacts than action at this time.

Alternative 2 would prohibit the possession of squid or squid parts on vessels that have reef fish and longline gear aboard. Based on analyses of observer data discussed in Section 6.1.2, this restriction on allowable bait types in the bottom longline component could impact at least 38% of the longline trips. Prohibiting the use of squid as bait in bottom longline fishing activities could result in bait losses due to the greater ability of squid for staying on hooks, especially at greater depths. These losses would be translated into increased bait costs and labor for affected longline operators. On average, bait costs currently account for 25% of the variable trip costs. In the bottom longline component of the commercial reef fish fishery, average variable costs and bait costs are estimated at approximately $4,000 and $1,000 per trip, respectively. Additionally, restrictions on bait type may adversely impact CPUE in the fishery, resulting in either reduced total revenues or increased operational costs to maintain total harvests. The magnitude of potential increases in bait costs and impacts on CPUE, and the subsequent effects on net revenues, associated with the bait prohibitions under **Alternative 2** are unknown. However, if bait type is an important factor in the interaction between hardshell sea turtles and bottom longline gear, **Alternative 2** could be expected to result in fewer interactions between hardshell sea turtles and bottom longline gear, and may help reduce the need for more restrictive management measures in the future, with associated greater adverse economic effects, to protect these threatened species.

6.1.4 Direct and Indirect Effects on the Social Environment

Modifying baits for the bottom longline component is one of the alternatives suggested by the industry to reduce interactions with hardshell sea turtles. Preferred **Alternative 1** would have little to no effect on fishing behavior, because it would require no modification of bait use. **Alternative 2** would require those who use squid to change to other bait types. This change may have few social effects if the industry is willing to change this fishing behavior to reduce the interactions with hardshell sea turtles. Although this alternative has been suggested by some industry representatives, it is not known whether this modification concerning the use of squid is widely supported. The support for this alternative does come from several individuals who represent industry associations, so it is likely that there would be support for this alternative as long as it was chosen over the more far-reaching measures that would restrict longline fishing. Much of the bait used, other than squid, is Atlantic thread herring and other baitfish that are harvested by the regional bait fishery. One industry representative indicated that up to 70% of their longline fleet uses Atlantic thread herring alone or in conjunction with squid. If there is a substantial reduction in longline effort, the market for bait fish may be also be affected as there may be no alternative outlets for baitfish which, in turn, may cause a reduction in effort in the regional baitfish fishery (K. Bell, Fish House/Retail/Restaurant owner, personal communication). On the other hand, if there is little reduction in effort, then replacing squid could increase the demand for baitfish. Squid bait may last longer and have a better catch rate if it is harder to get off the hook, thereby reducing catch rates if alternative baits are used exclusively. The extent of either of these impacts is not known but certainly it is reasonable to expect some change in revenues as a result and subsequent profit margins for vessels that rely on squid as their primary bait.

6.1.5 Direct and Indirect Effects on the Administrative Environment

Impacts to the administrative environment would not change under **Preferred Alternative 1**. However, **Alternative 2** would create an additional restriction to the commercial reef fish fishery for law enforcement to monitor. Enforcement of bait requirements for longline gear would be difficult because bait type could only be determined before fishing occurred, and therefore, before a violation occurred.

6.2 Action 2: Restrict the Use of Bottom Longline Gear for Reef Fish in the Eastern Gulf of Mexico (east of 85°30’ W longitude, near Cape San Blas, Florida)

6.2.1 Direct and Indirect Effects on the Physical Environment

Impacts of these alternatives on the physical environment would depend on the resulting reduction in the level of fishing effort in the commercial reef fish fishery. The commercial bottom longline component of the reef fish fishery targets bottom-dwelling reef fish species. Specifics on the biology and habitat utilization of reef fish are detailed in section 3.2.1. Bottom longline gear is used to target SWG and DWG, as well as red snapper and other reef fish. Consequently, the close proximity of the deployed longline gear to the substrate adds to interactions with the habitat. Prior to 2007, bottom longline gear accounted for 36% of the commercial gag landings and 59% of the commercial red grouper landings. Vertical line gear accounted for 27% of the commercial red grouper landings and nearly all of the recreational red grouper landings. Fishing effort by the SWG bottom longline component of the reef fish fishery is most concentrated in water depths between 20 and 50 fathoms; only 3% of red grouper and 4% of gag caught during the reef fish observer study were from water of 50 fathoms or deeper.

Alternative 1 would maintain the existing levels of impact on the physical environment. Bottom Longline gear comes in direct contact with the substrate. Its potential for adverse impact is dependent on the type of habitat it is set on, the presence or absence of currents and the behavior of fish after being hooked. High (1998) used submersibles to observe longline fishing in a halibut longline fishery off of Alaska. The study found that the longline gear on the bottom would sometimes take extreme angle turns as currents, snags, and hooked fish would affect its location (High, 1998). Longlines were observed in contact with or snagged on a variety of objects including coral, and upon retrieval, corals were brought to the surface. In contrast, in a similar submersible study by Grimes et al. (1982) on a tilefish longline fishery off of New Jersey, there was no evidence that longlines shifted significantly even when set in currents. This was attributed to the use of anchors at the ends and weights placed along the line.

Vertical line gear is less likely to contact the bottom than bottom longlines, but still has the potential to snag and entangle bottom structures and cause damage to the substrate (Barnette 2001). If any hook-and-line gear is lost or improperly disposed of, it can entangle marine life (Hamilton 2000; Barnette, 2001). Entangled gear often becomes fouled with algal growth. If this gear becomes entangled on corals, the algae can eventually overgrow and kill the coral.

Anchor damage by vertical line fishing vessels, including both commercial and recreational vessels, is also potentially damaging to the substrate. Hamilton (2000) points out that "favorite" fishing areas such as reefs are targeted and revisited multiple times, particularly with the advent of global positioning technology. The cumulative effects of repeated anchoring could damage the hard bottom areas where fishing for reef fish occurs.

Alternative 2, closing specific areas to longlining, could geographically shift the fishing effort. In addition, the area closures may cause a gear shift from bottom longline to vertical line gear. **Option a** establishes a north-south boundary between 27^o and 28^o N latitude for a closure to bottom longline gear. This area closure would reduce the physical environment impacts from bottom longline gear between 27^o and 28^o N latitude from bottom longline gear; however, a gear shift may increase impacts associated with vertical line gear in the closed area. The impacts from bottom longline gear on the physical environment north and south of the closed area would most likely increase due to the geographic shift in fishing effort. **Option b** establishes a north-south boundary between the 26^o and 28^o N latitude for a closure to bottom longline gear. This area closure would reduce the physical environment impacts between 26^o and 28^o N latitude from bottom longline gear; however, a gear shift may increase impacts associated with vertical line gear in the closed area. The impacts from bottom longline gear on the physical environment north and south of the closed area would most likely increase due to the geographic shift in fishing effort. **Preferred Option c**, if implemented as a stand-alone restriction under this action, would eliminate the commercial fishing effort in the bottom longline component of the reef fish fishery east of Cape San Blas, Florida, and in turn the physical impacts of this gear to the environment in the eastern Gulf. However, a shift in effort from bottom longline to vertical line gear may occur and result in increased impacts associated with the vertical gear, but these impacts would likely be less than those incurred by bottom longline gear.

Alternative 3 would restrict the commercial fishing effort in the bottom longline component of the reef fish fishery by specific water depths based on the generalized bathymetric contours. **Alternative 3 Options a-d** would move the bottom longline component of the reef fish fishery to water depths greater than the current 20 fathom regulation boundary. Moving the bottom longline gear boundary would decrease the impacts to the physical environment from the gear within the closed areas. The geographic shift of fishing effort in the bottom longline component of the reef fish fishery may increase the physical impacts in deeper waters associated with the modified closure areas. In turn, as the regulation boundary increases in depth, **Options a-d,** respectively, a corresponding shift from bottom longline to vertical line gear may occur. The impact on the physical environment from bottom longline gear would be decreased; however, a shift in effort from bottom longline to vertical line gear would still create physical impacts, but these would likely be less than those incurred by bottom longline gear.

Alternative 4 adjusts the length of the bottom longline gear fishing season. **Preferred Option a** decreases the commercial fishing effort in the bottom longline component of the reef fish fishery by reducing the fishing season from year-round (**Option c**) to a three-month period (June-August). **Option b** decreases the fishing season to a five-month period (April-August). **Option a** and **Option b** would decrease the impacts on the physical environment from bottom longline gear during the closed season; however, the impacts may increase during the adjusted season due to an increase in fishing effort. Additionally, a shift in effort from bottom longline to vertical line gear may occur during the closed season causing an increase of impacts to the physical environment associated with the vertical line gear.

6.2.2 Direct and Indirect Effects on the Biological/Ecological Environment

Direct effects of the Gulf reef fish fishery on sea turtles occur when sea turtle interactions with fishing gear result in the incidental capture injury or mortality. A variety of factors may affect the likelihood and frequency of sea turtles being caught in reef fish bottom longline gear. The spatial overlap between fishing effort and sea turtles is one such factor. The more abundant sea turtles are in a given area where the fishing gear is set, the greater probability a sea turtle would be incidentally caught on the gear.

The distribution of sea turtles in the eastern Gulf is presented in several studies. A satellite telemetry study (Figure 6.2.2.1) conducted from 1998-2002 tagged 24 female loggerhead sea turtles (Schroeder et al. manuscript in prep). Further analysis of the telemetry data indicates that while sea turtles move throughout the areas of the eastern Gulf, some sea turtles remain in offshore areas year-round (A. Meylan, Biologist, FWRI, personal communication). The highest concentration of time spent by the sea turtles was in water depths between 20 fathoms and 40 fathoms (Figure 6.2.2.2). Some migratory tracks show loggerhead sea turtles moving along shore, usually in depths less than 50 fathoms, along the entire west coast of Florida (FWC letter to Crabtree, December 9, 2008). Some migratory tracks also show loggerhead sea turtles in much deeper water while traversing the Gulf and Caribbean. However, 89% of foraging destinations of female loggerhead sea turtles were in depths of 50 fathoms or less (A.D. Tucker, Mote Marine Laboratory unpublished data; see Appendix B). An aerial survey (NMFS 2009b) observed sea turtles during the summer and winter of 2007. For the sea turtles observed in water depths greater than 20 fathoms and east of Cape San Blas, Florida ($85^{o}30'$ W), the majority were found in water depths between 20 fathoms and 50 fathoms (Figure 6.2.2.2). Loggerhead sea turtle encounter rates were generally higher in the summer (Figure 6.2.2.3) than the winter in water depths between 20 fathoms and 60 fathoms (Figure 6.2.2.4). However, the sea turtle encounter rate for the aerial survey may be influenced by the probability of sighting a sea turtle associated with the time the sea turtles spend near the surface which would also be dependent of the sea turtle dive profile. Currently, it is unknown whether or not there is a statistical correlation between the depth ranges and sea turtle sightings. Additional studies by Braun-McNeill and Epperly (2002), and Davis et al. (2000) present the distribution of loggerhead sea turtles in the Gulf based on Marine Recreational Fishery Statistics Survey and aerial survey, respectively. These studies provide spatial distributions of loggerhead sea turtles that may indicate a spatial correlation in the geographic extent of the population in the Gulf. The spatial correlation is important for estimating the probability associated with reducing sea turtle interactions with the bottom longline component of the reef fish fishery through establishing closed areas.

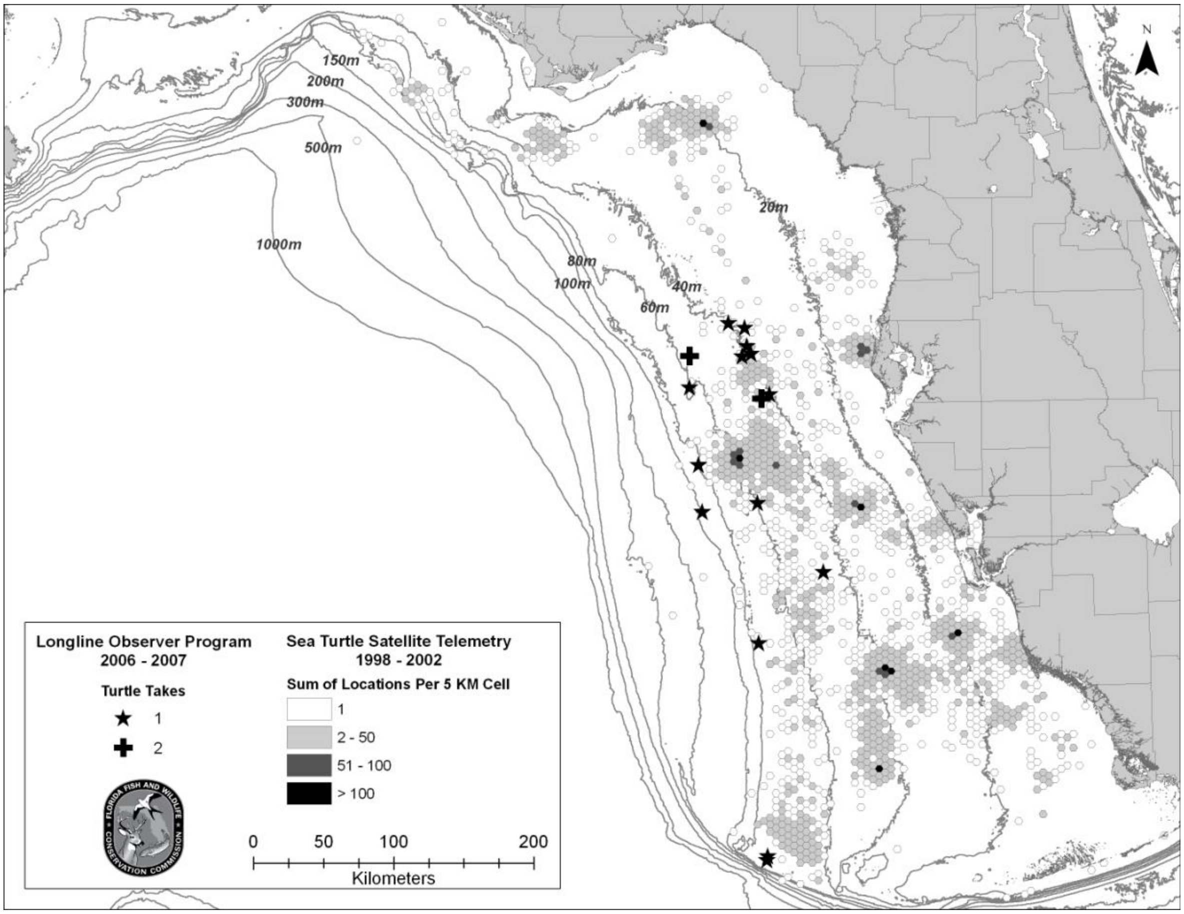

Figure 6.2.2.1. Spatial frequency distribution of sea turtle satellite telemetry data from 1998-2002 (Schroeder et al., manuscript in prep) and SEFSC sea turtle take data from bottom longline observer data during 2006-2007 (NMFS-SEFSC 2008). The depth contours are presented in meters (conversion: 1 meter = 0.5468 fathom). Using this conversion, 50 fathoms is approximately 91 meters in depth.

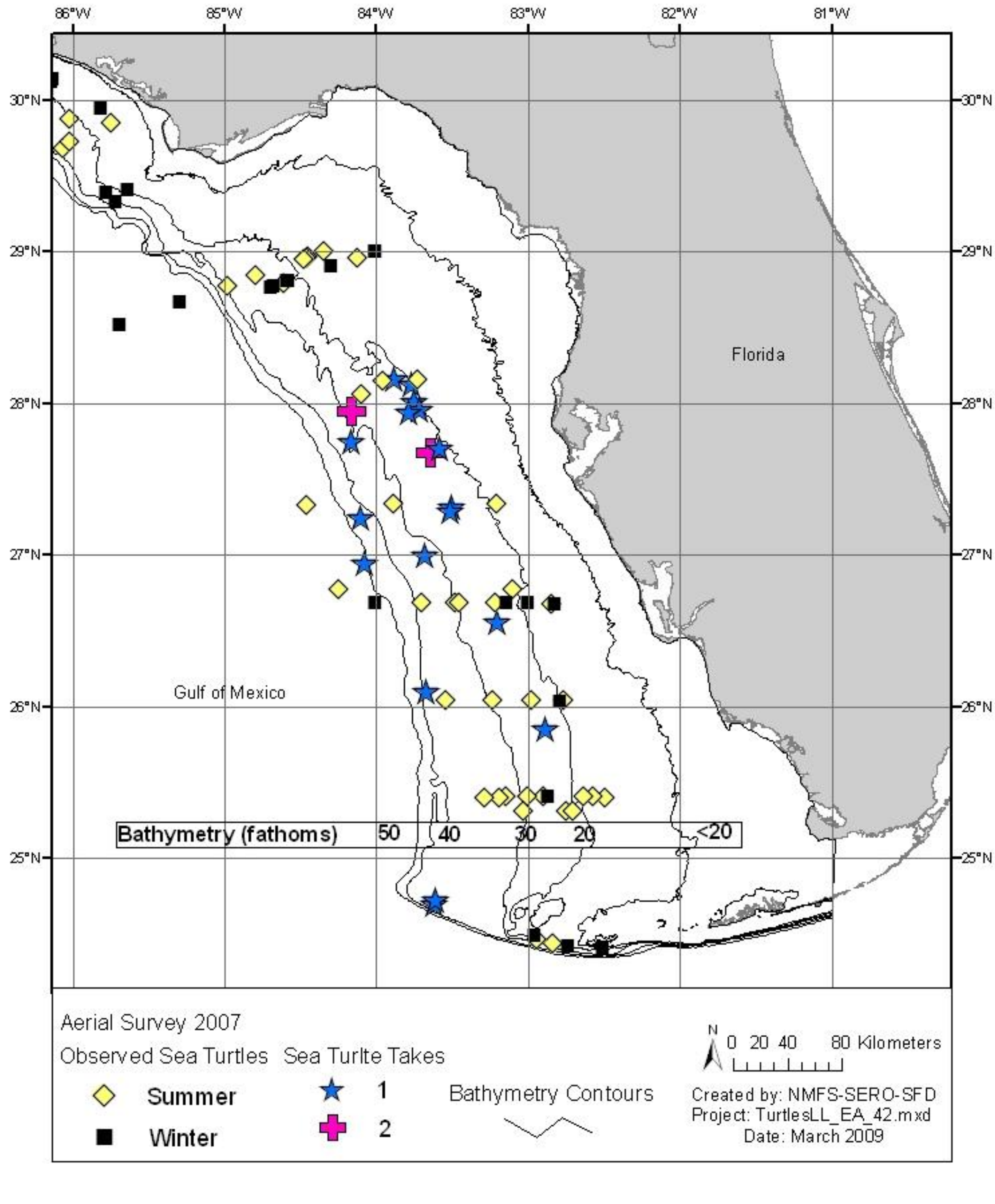

Figure 6.2.2.2. SEFSC observed sea turtle take data (NMFS-SEFSC 2008; 2009) and sea turtle location data from the aerial survey study (NMFS 2009b). The map shows the sea turtles observed in depths greater than 20 fathoms. The aerial surveys were conducted during the summer and winter 2007; observer data is from 2006-2008.

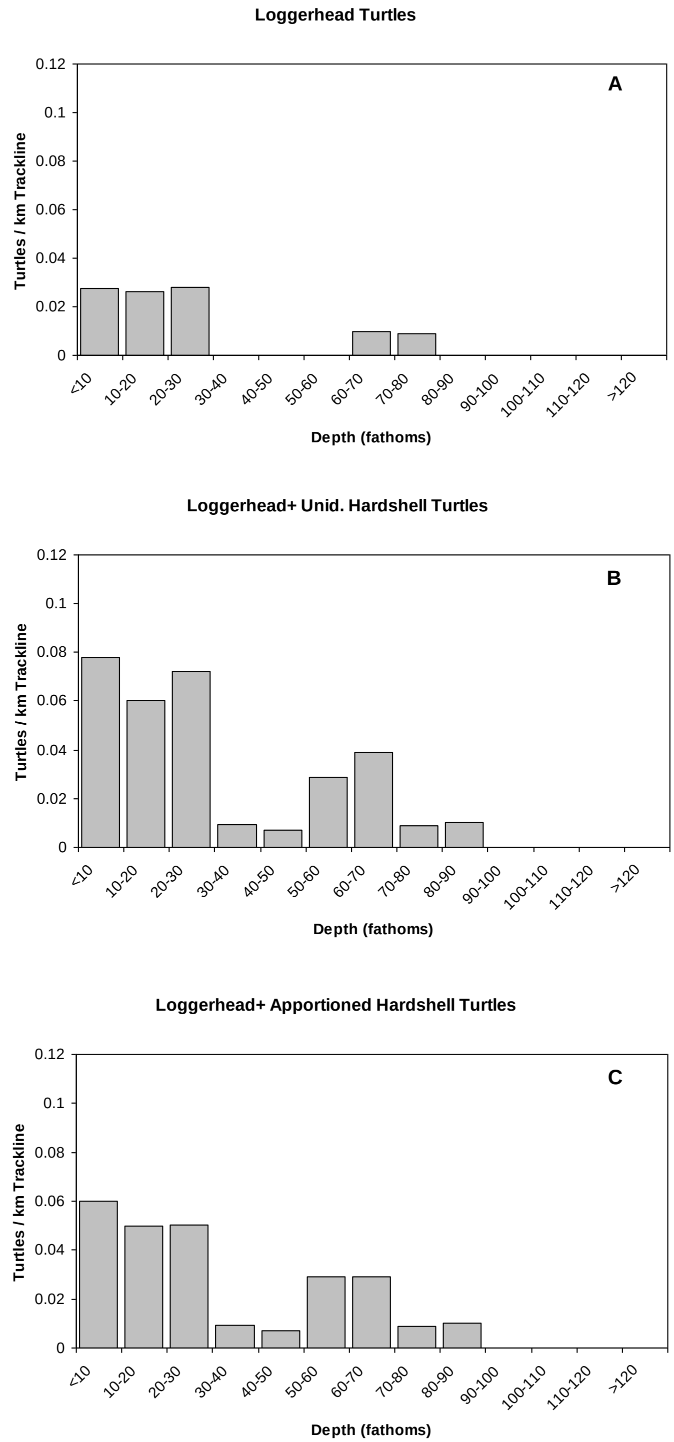

Figure 6.2.2.3. Loggerhead sea turtle encounter rate (number of sea turtles per km of aerial survey trackline) as a function of depth during the winter survey. Plots include (A) identified loggerhead sea turtles, (B) loggerhead sea turtles plus all unidentified hardshell sea turtles, and (C) loggerhead sea turtles with apportioned hardshell sea turtles based on neighborhood averaging (NMFS 2009b).

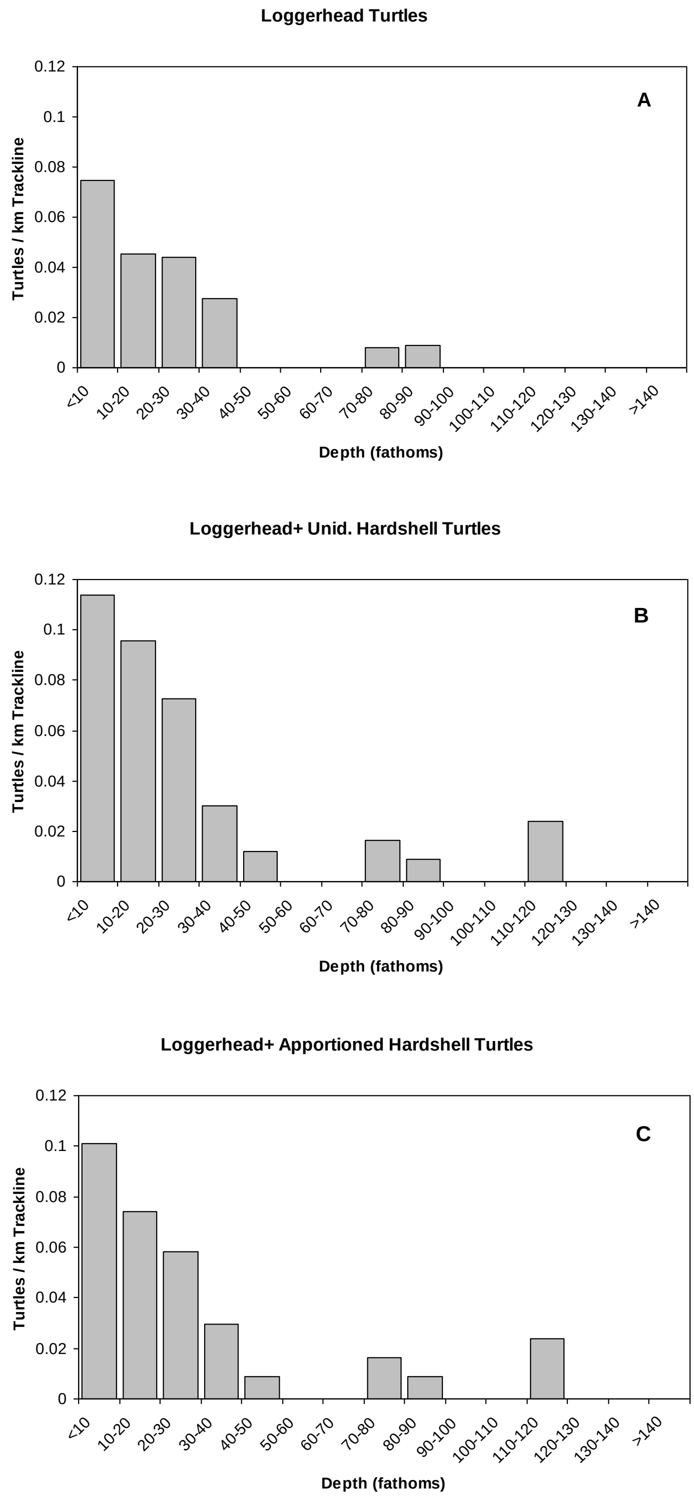

Figure 6.2.2.4. Loggerhead sea turtle encounter rate (number of sea turtles per km of aerial survey trackline) as a function of depth during the summer survey. Plots include (A) identified loggerhead sea turtles, (B) loggerhead sea turtles plus all unidentified hardshell sea turtles, and (C) loggerhead sea turtles with apportioned hardshell sea turtles based on neighborhood averaging (NMFS 2009b).

The biological impacts on sea turtles would depend on the reduction in the level of fishing effort in the commercial reef fish fishery. If the Council had chosen **Alternative 1,** no action, other actions would need to be taken to reduce sea turtle takes sufficiently to protect and conserve sea turtles.

Alternative 2 closes specific areas for fishing with bottom longline gear. These areas coincide with the distribution of sea turtles in the Gulf as suggested by the previously discussed studies. **Alternative 2 Options a** and **b** would prohibit the use of bottom longline gear in areas based on north-south latitude boundaries that are 60 or 120 miles apart, respectively, which may cause fishing effort to geographically shift to other areas in the Gulf. The geographic shift would increase fishing effort and potentially sea turtle interactions in the other areas. For an in depth discussion of geographic shift of fishing effort and potential gear conversion, see section 6.2.3. **Alternative 2 Option a**, closing the north-south boundary between 27^{o} and 28^{o} N latitude, would encompass 57% of the observed sea turtle takes (Table 2.2.1, NMFS-SEFSC 2009). **Alternative 2 Option b,** closing the north-south boundary between 26^{o} and 28^{o} N latitude, doubles the closure area in **Option a,** and would encompass 71% of the observed sea turtle takes (Table 2.2.1, NMFS-SEFSC 2009). Analysis of the logbook dataset shows 43% of SWG bottom longline trips reported during 2006-2007 in waters from 27 to 28^{o} N latitude (**Alternative 2, Option a**) and 69% were from 26 to 28^{o} N latitude (**Alternative 2, Option b**) (NMFS 2009a). In response to the closure area, a gear shift from bottom longline to vertical line gear may occur. The interactions with sea turtles and bottom longline gear may decrease while interactions with vertical lines may increase. However, the interactions of sea turtles with vertical line gear appear to be less frequently documented with no observed takes in the RFOP in 2006-2008 (NMFS-SEFSC 2009). Additionally, mortality is believed to be substantially less with interactions between sea turtles and vertical line gear because although hooked, the sea turtles are able to reach the surface to breathe. **Alternative 2 Preferred Option c**, if implemented as a stand-alone restriction under this action, would prohibit the use of bottom longline gear to harvest reef fish in the entire latitudinal extent of the eastern Gulf. This closure would encompass 100% of the observed sea turtle takes (Table 2.2.1, NMFS-SEFSC 2009). The impact on sea turtles would include reduced takes by the bottom longline component of the reef fish fishery from the decrease in fishing effort and elimination of gear. However, a shift in effort from bottom longline to vertical line gear may cause an increase in sea turtle interactions in the vertical line component.

Alternative 3 would close an area based on water depth contours. The least restrictive closure at 30 fathoms (**Alternative 3 Option a**) could displace 39% of the bottom longline fishing effort estimated from the logbook dataset (NMFS 2009a). The most restrictive closure at 50 fathom **(Alternative 3 Option d)** could displace an estimated 74% of the bottom longline fishing effort estimated from the logbook dataset (NMFS 2009a). Currently, in the eastern Gulf (east of 85^{o}30’ W longitude), bottom longline gear can only be used at depths greater than 20 fathoms (36.6 m) (**Alternative 1)**. All but one sea turtle take documented by observers (NMFS-SEFSC 2009) were on sets at 50 fathoms or less, and 89% of sea turtles taken were on sets at 40 fathoms or less. The average fishing depth for observed sets that captured sea turtles was 28.5 fathoms, as opposed to an average fishing depth of 36.6 fathoms for all observed sets. Since loggerhead sea turtles spend most of their time in the top three fathoms of water and may dive to 100 fathoms (Spotila 2004), the probability of interactions between the bottom longline gear increases in these coinciding depth ranges.

An aerial survey by the SEFSC (NMFS 2009b) showed sightings of sea turtles on the west Florida shelf (Figure 6.2.2.2). Of the sea turtles observed in depths greater than 20 fathoms, the concentrations of sea turtles were low in depths greater than 60 fathoms in winter (Figure 6.2.2.3) and in depths greater than 40 fathoms in summer (Figure 6.2.2.4). Distribution of bottom longline fishing effort, based on the logbook data, is greatest between 20 fathoms and 45 fathoms (NMFS 2009a). The closure of areas based on these depths would displace the majority of the fishing effort. The shift in fishing effort may include a geographic or gear shift in effort.

For **Alternative 3 Options a-d**, the probability of interactions with sea turtles would be reduced in waters less than the selected fathom regulation line (Figure 2.2.2) due to the reduction in overall fishing effort; however, the probability of interaction may either increase or decrease in waters greater than the fathom regulation line depending on whether a geographic or gear effort shift occurs in the fishery. Analysis of the logbook dataset shows 74% of SWG bottom longline trips occurred in water depths from 20 to 50 fathoms during 2006-2007 (NMFS 2009a). The 2006-2007 SWG bottom longline fishing effort between the 20 and 30 fathoms was 39% and 23% between the 30 and 40 fathoms. If fishing effort shifts geographically to deeper water, sea turtle interactions could be reduced although probably not eliminated. A closure based on the 35 fathom contour (**Alternative 3 Preferred Option b**) may reduce bottom longline fishing effort; however, it could cause an increase in effort between 35 and 50 fathoms. In turn, the geographically displaced effort could result in an equal amount of sea turtle interactions in water depths greater than 35 fathoms (**Alternative 3 Preferred Option b**). Additionally, if a shift in fishing effort occurs from bottom longline to vertical line gear, it is likely that sea turtle interactions with vertical line would increase. For an in depth discussion of geographic shift of fishing effort and potential gear conversion, see section 6.2.3.

Alternative 4 Options a and b, would decrease the length of the bottom longline fishing season. This would in turn reduce the fishing effort during the spring and summer months. The aerial survey recorded more sea turtles in the summer than the winter months in the eastern Gulf in waters deeper than 20 fathoms (NMFS 2009b). Although the shortened bottom longline gear season may cause higher effort during the winter months, it is likely that the overall sea turtle interactions would be reduced. Although most of the bottom longline fishing effort occurs during April-August, the fishing effort of the bottom longline component of the reef fish fishery for SWG is distributed throughout the year (NMFS 2009a). **Alternative 4 Preferred Option a** closes the fishing season during June-August which coincides with the highest rate of sea turtle interactions according to the current information from the observer study (NMFS-SEFSC 2009). However, a concentration of sea turtle takes in April 2008 (NMFS-SEFSC 2009) may suggest extending the closure to include April-August (**Alternative 4 Option b**)**.** A year-round closure (**Alternative 4 Option c**) would eliminate bottom longline fishing effort and in turn reduce sea turtle interactions with bottom longline gear. If **Alternative 4 Option c** was implemented, a shift from bottom longline to vertical line gear may occur, this could result in a potential increase in interactions between sea turtles and vertical line gear.

The combination of the **Action 2** alternatives, such as prohibiting longlining during April-August (**Alternative 4 Option b**) in the EEZ between 26^{o} and 28^{o} N latitude **(Alternative 2 Option b)** for water depths less than 35 fathoms (**Alternative 3 Preferred Option b**), could result in a combination of fishing effort reduction, geographical effort shift, and a shift in gear to vertical lines. Based on the logbook fishing effort information during 2006-2007, this combination of options may displace or reduce 43% of fishing effort for this spatial and temporal area. The combination of the preferred alternatives (**Alternative 2 Option c, Alternative 3 Option b, Alternative 4 Option a**) would prohibit the use of bottom longline gear in water depths less than 35 fathoms for the entire latitudinal extent of the eastern Gulf during the months of June-August. Based on the logbook fishing effort information during 2006-2007, this combination of options may displace or reduce approximately 68% of fishing effort for this spatial and temporal area. However, depending on the distribution of sea turtles throughout the Gulf, effort shift either geographically or to another gear type may limit the reduction in overall sea turtle takes in the fisheries. If sea turtles are spatially and temporally ubiquitous throughout the eastern Gulf, and the sea turtle interactions are correlated with only with fishing effort, then a net reduction in bottom longline fishing effort must occur to decrease the sea turtle takes.

To account for effort shifts, calculations of percent reductions in effective effort (relative to 2007-2008) can be used as an estimate of potential turtle bycatch reduction. Effective effort is the number of hooks as reduced by scalar reduction in sea turtle bycatch rate following redistribution of effort from 20-35 fathoms to deeper water during seasonal closures (NMFS 2009c). Give the preferred closure of eastern Gulf waters less than 35 fathoms during June-August, if all effort shifts to deeper water during the closure, effective effort would be reduced 14% (7-17%, 95% CI); if 50% of effort shifts to deeper water, effective effort would be reduced 16% (13-18%, 95% CI).

Reef Fish

The analysis below is based on data from logbooks submitted to the SEFSC. Data are from trips in statistical areas 1-8 (eastern Gulf); area 8 extends west of 85°30' W longitude, so the analysis may overestimate the expected effects of the proposed alternatives. The analysis mainly uses logbook data from 2005-2007 because data are incomplete for 2008. Analyses involving depth omit 2005 data because many logbook entries in this year did not include depth data. During 2005-2007, longline landings in the eastern Gulf averaged 77% groupers and tilefishes; in 2008, these species made up 93% of longline landings (through September 15). Therefore, most of the analysis focuses on the grouper and tilefish sectors of the reef fish fishery.

The biological impacts of **Alternative 1** would be the same as currently realized by the gear. Longline landings of all grouper and tilefish species for 2005-2007 averaged approximately 5 million pounds GW on an average 1,280 trips per year. During 2005-2007, an annual average of 122 vessels made an average of 944 trips that used bottom longline gear and landed SWG (at least one record in the logbook) in the eastern Gulf. SWG include red grouper, black grouper, gag, rock hind, red hind, yellowmouth grouper, yellowfin grouper, and scamp. In 2005-2007, red grouper dominated the commercial longline SWG landings by weight (78%; NMFS 2009a).

Restricting the use of bottom longline gear should reduce effort in the reef fish fishery. Reduced effort would reduce direct fishing mortality of many target species as well as discard mortality of target and non-target species. Longline landings make up 71% of the total commercial red grouper landings (NMFS 2009a) and have an estimated release mortality for red grouper of 45% versus 10% for vertical lines (SEDAR 12 2007). Thus reductions in longline effort could reduce both directed fishing mortality and release mortality for red grouper even if vertical line fishing increased.

Some fishermen currently using longline gear may switch to vertical line gear if areas, depths, or months are closed to bottom longlining. The amount of potential effort shift to vertical line gear cannot be estimated at this time. For most species, CPUE is higher with longline gear than vertical line gear, so an effort shift should result in reduced landings. Conversely, some SWG species are more easily caught with vertical lines and landings could increase. Only 3% of DWG were landed with vertical lines, so any prohibitions on bottom longlines that include deep water would substantially impact landings in this sector of the fishery.

Alternatives in this amendment could create an area within which bottom longline gear is restricted while buoy gear is allowed. Buoy gear is legally defined as fishing gear consisting of a float and one or more weighted lines suspended there from, generally long enough to reach the bottom. A hook or hooks (usually 6-10) are on the lines at or near the end. The float and line(s) drift freely and are retrieved periodically to remove catch and re-bait hooks. Buoy gear is included in the general category of hook-and-line gear (50 CFR 622.2), and is listed as an authorized gear in the Gulf reef fish hook-and-line component of the fishery under the Allowable Gear Rule (50 CFR 600.725, 64 FR 67511). Buoy gear was reported to be used in the Gulf reef fish fishery between 1984 and 1992, primarily off Louisiana to target red snapper and yellowedge grouper. The use of buoy gear appears to have dropped off rapidly after the longline and buoy gear boundary was established in 1990. Vessel logbooks for commercial reef fish vessels were implemented in 1991, but the SEFSC discontinued including a separate column for buoy gear in 1993. Although no buoy gear has been reported to be used in the Gulf EEZ since 1992, anecdotal information suggests that some fishermen are attempting to revive its use.

Although the amount of catch with buoy gear appears comparable to that of bandit rigs, buoy gear was reported to catch a broader size range of fish (GMFMC 1989). Buoy gear is reported to be effective where fish are scattered over a wide area as individuals and not in schools. No bycatch data are available for buoy gear in the Gulf, but Olsen et al. (1974) reported the most frequently caught fish using buoy gear off the U.S. Virgin Islands were red snappers, groupers, and jacks, and the general size and species composition was similar to that from electric reel fishing. The weights used range from one to six pounds, and soak times are generally one to one and a half hours. If a sea turtle is hooked by this gear, heavier weights could create difficulty for a hooked sea turtle trying to get to the surface to breathe, but the short soak times could improve survival. At this time, no information is known about the interaction with buoy gear and sea turtle hooking incidents.

Effort could also shift to other species besides groupers. During 2005-2007, 23% of fish landed from longline trips were species other than grouper or tilefish species (NMFS 2009a). Three reef fish species outside the grouper and tilefish complex are undergoing overfishing and could be impacted by an effort shift. Red snapper is under an IFQ program that limits effort and would prevent increases in landings. During 2005-2007, 16% of greater amberjack and 13% of gray triggerfish were landed with longline gear. Gray triggerfish occur mainly in depths less than 50 fathoms (SEDAR 9 2006c). Greater amberjack occur in a wide range of depths, but as pelagic feeders should not interact with longline gear except in relatively shallow water or as gear is deployed or retrieved in deeper water. The highest landings are for vertical line gear in 30-40 fathoms for greater amberjack (28% of all landings) and in 20-40 fathoms for gray triggerfish (55% of all landings). The CPUE of both these species is substantially higher for vertical line gear than for longline gear (NMFS 2009a). For that reason, any shift in effort from longline to vertical line gear could result in increases in catch of these species. A substantial increase in catch could threaten rebuilding plans for these species. However, in 2005 more than a quarter of vessels landing greater amberjack and more than half of vessels landing gray triggerfish reported less than 100 pounds of landings of those species (GMFMC 2008b), implying a relatively large number of vessels operate on a part-time basis catching greater amberjack and gray triggerfish, or these species are sources of secondary revenue for operators primarily targeting other reef fish. Landings did not exceed quotas for either of these species in 2008 (first year of quotas).

Of longline trips from logbooks reporting SWG landings, 49% were between 27^o and 28^o N latitude (**Alternative 2, Option a**) and 80% were between 26^o and 28^o N latitude (**Alternative 2, Option b**). During 2006-2007, 43% of SWG longline trips reported through logbooks were in waters from 27^o to 28^o N latitude and 69% were from 26^o to 28^o N latitude; logbook landings show 42% of SWG longline landings were from 27^o to 28^o N latitude and 64% were from 26^o to 28^o N latitude (NMFS 2009a).

Pairing options from **Alternative 2** with options from **Alternatives 3 or 4** would result in different effects to landings. For example, a prohibition of longline gear in waters less than 50 fathoms for the area between 26^o and 28^o N latitude would correspond with 53% of all SWG longline landings during 2006-2007 (Table 6.2.2.1). Options from **Alternative 2** could also be paired with options from **Alternative 4**. For example, a prohibition of bottom longline gear between 26^o and 28^o N latitude during April-August would correspond with 28% of SWG longline landings for the whole Gulf during 2005-2007 (Table 6.2.2.2).

Table 6.2.2.1. Longline SWG landings (to the nearest 100 pounds GW) and number of trips in the Gulf (2006-2007 averages) for combined options in Alternative 2 and Alternative 3 (NMFS 2009a). Only logbook records with depth recorded were included.

	Alternative 3 - Depth (fathoms)					
Alternative 2 - Area	Option a (< 30)	Preferred Option b (< 35)	Option c (< 40)	Option d (< 50)	All depths	Trips
Option a (27-28^o)	701,700	887,456	904,600	1,056,400	1,124,100	400
Option b (26-28^o)	1,025,500	1,310,349	1,336,900	1,605,000	1,725,300	600
Preferred Option c (Eastern Gulf)	1,400,800	1,967,851	2,236,900	2,707,100	3,010,200	1,200

Table 6.2.2.2. Longline SWG landings (to the nearest 100 pounds GW) in the Gulf (2005-2007 averages) for combined options in Alternative 2 and Alternative 4 (NMFS 2009a).

	Alternative 4 – Season		
Alternative 2 - Area	Preferred Option a (June- Aug)	Option b (Apr-Aug)	Option c (All year)
Option a (27-28°)	375,900	932,700	1,246,900
Option b (26-28°)	573,800	948,700	1,911,900
Preferred Option c (East Gulf)	1,066,800	1,743,600	3,424,900

If bottom longline gear was prohibited in a particular area **(Alternative 2, Options a and b**), fishermen would likely move to other areas to fish. A smaller closure area would increase the likelihood of effort shifting to open areas without decreasing sea turtle takes. Had **Alternative 2, Preferred Option c** been chosen and an option was not chosen for **Alternative 3**, then bottom longline fishing for reef fish would be prohibited throughout the entire eastern Gulf, and effort could only shift to other gear or non-reef fish species. By combining **Alternative 2, Preferred Option c** with an option under **Alternative 3**, bottom longline fishing would be prohibited throughout the eastern Gulf, but only at certain depths, and effort could shift to deeper water. If deeper waters are closed to longlining, fishing for DWG and tilefish would be drastically reduced because few of these species are caught using vertical lines (Table 6.2.2.3). Species undergoing overfishing could experience higher landings because vertical lines have a higher CPUE than longlines. The impacts of potential effort shift to vertical line gear on select reef fish were calculated as follows:

where $\bar{L}$ is mean annual landings (total weight in pounds GW) in the eastern Gulf from 2005–2007, δ is a scalar proportional effort shift, and $\bar{E}$ is mean annual effort (days at sea) in the eastern Gulf from 2005-2007.

Table 6.2.2.3. Percent change (relative to 2005-2007 average) in landings given prohibition of bottom longline gear in the eastern Gulf, and some proportional effort shift to vertical line gear in same region (NMFS 2009a). Negative numbers are reductions, positive numbers are increases.

	Proportional Effort Shift				
Species	0.2	0.4	0.6	0.8	1.0
SWG	-50.0	-45.3	-40.6	-35.9	-31.2
Red Grouper	-53.3	-49.0	-44.5	-40.5	-36.2
Gag	-29.6	-22.5	-15.4	-8.3	-1.2
DWG	-89.0	-85.5	-82.0	-78.5	-75.0
Greater Amberjack	+14.4	+35.5	+56.7	+77.9	+99.1
Gray Triggerfish	+13.5	+20.2	+26.9	+33.6	+40.3

Alternative 3 would prohibit bottom longline gear only in shallow water, and thus would have little impact on fishing for DWG and tilefish. Fishing effort by the SWG longline fleet is most concentrated in waters between 20 and 50 fathoms; 82% of longline trips landing SWG during 2005-2007 were in waters less than 50 fathoms (Table 6.2.2.4). During the reef fish observer study, 96% by number of gag and red grouper were caught on sets in waters less than 50 fathoms. During reef fish trips observed during the shark bottom longline observer study, 99% by number of gag and red grouper were caught on sets in waters less than 50 fathoms (Table 6.2.2.5). Logbooks from the same time period show 89% by weight of SWG longline landings were from waters less than 50 fathoms (Table 6.2.2.4).

Table 6.2.2.4 Average longline landings (to the nearest 100 pounds GW) for SWG and average numbers of longline SWG trips in the Gulf by depth (NMFS 2009a). Total includes logbook records with no depth recorded (not included in analyses).

	Depth (fathoms)							
	< 20*	20 - 30	30 - 35	35-40	40 - 50	50+	All depths	Total
Trips	95	352	294	78	161	200	1,109	1,261
Landings	178,200	963,100	826,500	192,900	537,900	280,800	2,979,400	3,069,500

*Bottom longline gear is prohibited in waters less than 20 fathoms. Trips recorded in logbooks as fishing at these depths may have been inaccurately recorded or may represent illegal fishing activity.

Table 6.2.2.5 Numbers of red grouper and gag caught on observed trips during two observer programs. Data for the Shark Bottom Longline Observer Program includes only trips when reef fish were targeted.

	Reef Fish Observer Program				Shark Bottom Longline Observer Program			
Depth (fathoms)	Red Grouper	Gag	Percent	Cumulative Percent	Red Grouper	Gag	Percent	Cumulative Percent
20-30	6,900	80	78.8	78.8	1,408	36	54.9	54.9
30-35	716	18	8.3	87.1	654	71	27.6	82.4
35-40	492	50	6.1	93.2	289	115	15.4	97.8
40-50	177	32	2.4	95.6	19	11	1.1	98.9
≥ 50	262	130	4.4	100	0	30	1.1	100
Total	8,547	310	100		2,370	261	100	

Source: Reef Fish Observer Program database, Southeast Fisheries Science Center

Some fishermen that currently use bottom longline gear may switch to vertical line gear if shallow waters are closed to longlining. Table 6.2.2.6 shows the expected changes in total SWG landings given various levels of shift in effort. These reductions were calculated as follows:

$$\text{Percent Reduction} = 1 - \frac{\bar{L}_{\text{all gears}} - \bar{L}_{\text{longline}(D)} + \delta * \bar{E}_{\text{longline(D)}} * \dfrac{\bar{L}_{\text{vertical line}(D)}}{\bar{E}_{\text{vertical line}(D)}}}{\bar{L}_{\text{all gears}}}$$

where $\bar{L}$ is mean annual landings (total weight in pounds GW) in the eastern Gulf from 2005–2007, D is depth of closure, δ is a scalar proportional effort shift, and $\bar{E}$ is mean annual effort (days at sea) in the eastern Gulf from 2005-2007.

Table 6.2.2.6 Percent change (relative to 2006-2007 average) in expected SWG landings given prohibition of bottom longline gear at various depths, and some proportional effort shift to vertical line gear in the eastern Gulf (NMFS 2009a). Negative numbers are reductions, positive numbers are increases.

	Proportional Effort Shift				
	0.2	0.4	0.6	0.8	1.0
Depth of Closure (Fathoms)					
30 (Option a)	-25.0	-22.6	-20.1	-17.7	-15.2
35 (Preferred Option b)	-32.4	-29.3	-26.2	-23.2	-20.1
40 (Option c)	-39.9	-36.2	-32.5	-28.7	-25.0
50 (Option d)	-48.2	-43.8	-39.3	-34.8	-30.3

Although total SWG landings would be reduced, some species, such as gag, have a higher CPUE for vertical lines, and therefore may show increased landings in some cases (Table 6.2.2.7). Based on regulations implemented in May 2009 under Amendment 30B, if 80% of either the gag or the red grouper quota is reached, and 100% of the quota is projected to be reached prior to the end of the fishing year, a 200-pound trip limit will be implemented for the applicable species. If 100% of any one of the three quotas is reached, the entire SWG component of the commercial sector will close for the remainder of the fishing year. During 2006-2007, red grouper landings averaged 74% of the red grouper quota. A gag quota was implemented in 2009 at 1.32 mp and will increase to 1.41 mp in 2010. Gag landings from 2006-2007 averaged 90% of the 2009 quota and 84% of the 2010 quota. Thus, if the fishery is prosecuted similarly in 2009 to previous years, 80% of the gag quota could be reached before the end of the year; however, even with a 100% shift in effort, the full quota would not be projected to be reached under any depth prohibition. Therefore, the trip limit would not be implemented and no closures would take place. Preliminary results from a new red grouper and gag stock assessment indicate the quotas for these species may need substantial reductions. In that case, the quotas would be more likely to be reached; however, the new grouper and tilefish IFQ program beginning in January 2010 should restrict catch and prevent closures. Regulations implementing the IFQ will remove the above mentioned trip limit reductions.

Table 6.2.2.7 Percent change (relative to 2006-2007 average) in expected red grouper and gag landings given prohibition of bottom longline gear at various depths, and some proportional effort shift to vertical line gear in the eastern Gulf (NMFS 2009a). Negative numbers are reductions, positive numbers are increases.

	Proportional Effort Shift				
Depth of Closure (fathoms)	0.2	0.4	0.6	0.8	1.0
Red Grouper					
30 (Option a)	-27.9	-25.6	-23.3	-21.1	-18.8
35 (Preferred Option b)	-38.8	-35.8	-32.8	-29.8	-26.8
40 (Option c)	-41.8	-38.5	-35.3	-32.0	-28.8
50 (Option d)	-48.3	-44.5	-40.7	-36.9	-33.1
Gag					
30 (Option a)	-5.7	-2.9	-0.1	+2.6	+5.4
35 (Preferred Option b)	-13.2	-8.8	-4.4	-0.1	+4.3
40 (Option c)	-16.4	-11.7	-7.1	-2.4	+2.2
50 (Option d)	-24.0	-18.1	-12.3	-6.4	-0.6

Some greater amberjack and gray triggerfish are caught on bottom longlines, but most are caught on vertical lines. Any effort shift to vertical lines could increase landings of these species (Table 6.2.2.8). Potential increases with effort shift for species undergoing overfishing were calculated as follows:

$$\text{Percent Reduction} = 1 - \frac{\overline{\mathrm{L}}_{\text{all gears}} - \overline{\mathrm{L}}_{\text{longline (D)}} + \delta * \overline{\mathrm{E}}_{\text{longline}(D)} * \dfrac{\overline{\mathrm{L}}_{\text{verticalline (D)}}}{\overline{\mathrm{E}}_{\text{verticalline (D)}}}}{\overline{\mathrm{L}}_{\text{all gears}}}$$

where $\overline{\mathrm{L}}$ is mean annual landings (total weight in pounds GW) in the eastern Gulf from 2006–2007, D is depth of closure, δ is a scalar proportional effort shift, and $\overline{\mathrm{E}}$ is mean annual effort (days at sea) in the eastern Gulf from 2006-2007.

Table 6.2.2.8. Percent change in expected greater amberjack and gray triggerfish landings given prohibition of bottom longline gear at various depths, and some proportional effort shift to vertical line gear in the eastern Gulf (NMFS 2009a). Negative numbers are reductions, positive numbers are increases.

	Proportional Effort Shift				
Depth of Closure (fathoms)	0.2	0.4	0.6	0.8	1.0
Greater Amberjack					
30 (Option a)	-1.0	+2.5	+5.9	+9.4	+12.9
35 (Preferred Option b)	0.0	+ 6.3	+ 12.6	+ 18.9	+ 25.2
40 (Option c)	+1.4	+10.0	+18.7	+27.3	+36.0
50 (Option d)	+3.2	+16.4	+29.6	+42.8	+56.0
Gray Triggerfish					
30 (Option a)	+0.2	+1.2	+2.3	+3.3	+4.3
35 (Preferred Option b)	+0.5	+3.0	+5.5	+7.9	+10.3
40 (Option c)	+0.6	+3.6	+6.7	+9.8	+12.9
50 (Option d)	+0.3	+4.8	+9.3	+13.8	+18.3

If longline fishermen do not change to vertical line gear, they may shift effort to DWG and tilefish. These species are typically caught in waters deeper than 50 fathoms. However, the DWG and tilefish quotas have been met each year since 2005. Any shift in effort to these species could cause quotas to be met earlier in the year. However, NMFS has published a final rule to implement an IFQ program for grouper and tilefish species in the Gulf, and intends to implement this program in January 2010. Under this program, closures would not occur, and fishermen could fish for whichever species they choose at any time throughout the year, if they have IFQ allocation for that species. Under a a seasonal restriction (**Alternative 4, Preferred Option a or Option b)**, fishermen could alter behavior to target SWG earlier in the year, assuming they could then target DWG and tilefish during the months when bottom longline gear is prohibited in shallower water.

By pairing options from **Alternative 3** with options from **Alternative 4,** longline gear would be prohibited in waters of particular depths during particular times of the year. For example, a prohibition on longline gear in waters less than 50 fathoms during April-August would correspond to 41% of SWG longline landings in the Gulf during 2005-2007 (Table 6.2.2.9).

Table 6.2.2.9. Longline SWG landings (to the nearest 100 pounds GW) in the Gulf (2005-2007 averages) for combined options in Alternative 3 and Alternative 4 (NMFS 2009a).

	Alternative 3 – Depth (fathoms)				
Alternative 4	Option a (< 30)	Preferred Option b (<35)	Option c (< 40)	Option d (< 50)	All depths
Preferred Option a (June-Aug)	428,700	592,185	671,300	815,100	888,500
Option b (Apr-Aug)	641,200	908,470	1,044,200	1,235,000	1,402,000
Option c (year-round)	1,400,800	1,967,851	2,236,900	2,707,100	3,010,200

Alternative 4 would restrict the use of bottom longline gear year round or during the months when most sea turtle takes were observed. This high level of takes may be because sea turtles were most abundant during that time or because the fishing effort for SWG was highest during that time. The number of SWG trips increased after May in 2005-2007 (Figure 6.2.2.5; NMFS 2009a). In recent years, many longline fishermen have targeted DWG early in the year, and then switched to SWG after DWG met its quota and closed. During the 2005-2007 and 2009 fishing seasons, the DWG catches met the quota and DWG was closed in June (a premature May closure in 2008 was followed by a 10-day re-opening in November because a small percent of the quota remained). However, fishermen anticipating prohibition of bottom longline gear in shallow water later in the year may alter behavior and target SWG earlier in the year, assuming they could then target DWG while the longline prohibition is in effect.

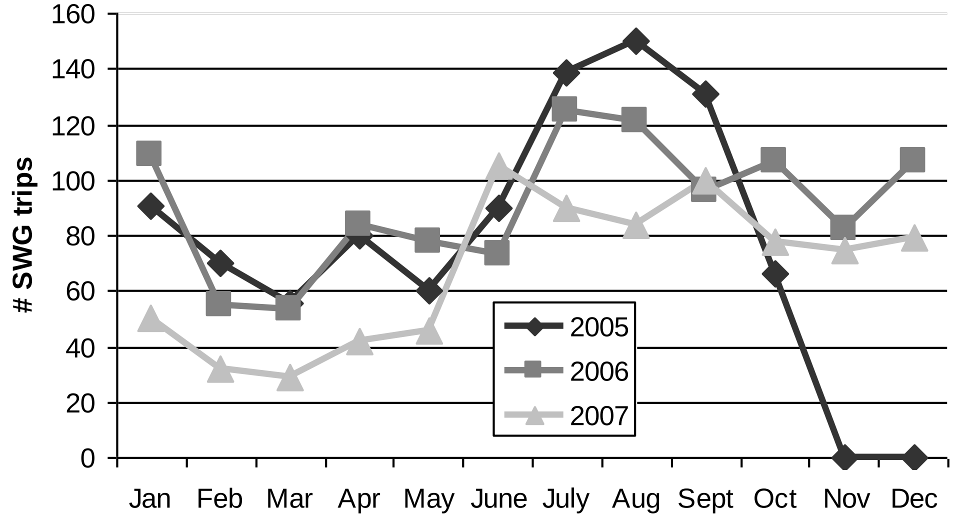

Figure 6.2.2.5. Number of trips landing SWG with longline gear in the eastern Gulf by month (NMFS 2009a). Note: In 2005, the SWG quota was met and that sector closed in October.

Alternative 4, Preferred Option a would prohibit the use of bottom longlines during the shortest period of time. The month with the largest number of SWG longline trips each year (2005-2007) falls within June-August and 30% of SWG landings were reported from these months. By choosing an option under **Alternative 3**, primarily SWG landings should be impacted; had the Council not chosen an option under **Alternative 3**, the prohibition would be at all depths and DWG and tilefish could also be heavily impacted. Because DWG and tilefish are landed almost exclusively by longlines, a prohibition on the use of this gear would effectively close down those sectors of the fishery. If the IFQ is not implemented January 1, 2010, and the DWG sector is prosecuted similarly in 2010 to 2005-2009 (June closure), at most that sector would be closed one month early; however, the sector would reopen in September and could land the rest of the quota then. Until recently, the tilefish sector closed on progressively earlier dates; in 2005 it closed in November, in 2006 it closed in July, in 2007 it closed in April, and in 2008 and 2009 it closed in May. If 2010 landings follow the same trend, this option should have no impact on the tilefish sector as the quota would be met by the proposed closure date (June 1).

Alternative 4, Option b would prohibit the use of bottom longlines for five months. During 2005-2007, 46% of longline SWG trips and 51% of SWG landings were reported during April-August (NMFS 2009a). As stated above, if the Council had not also chosen an option under **Alternative 3**, the prohibition would be at all depths. If the IFQ is not implemented, and if the DWG and tilefish sectors are prosecuted similarly in 2010 to previous years, the DWG sector could be closed two to three months early and the tilefish sector could be closed one month early, with the opportunity to catch the rest of the quota after reopening in September.

Alternative 4, Option c would prohibit the use of bottom longlines year round. Depending on which other alternatives and options the chosen by the Council for this action, a year-round prohibition could effectively eliminate the entire longline component of the reef fish fishery in the eastern Gulf. Most likely if the Council had chosen this option they would also choose one or more options under **Alternatives 2 and 3** to limit the geographic extent of the gear prohibition and allow some longline fishing to occur.

The preferred options under each alternative are intended to provide the continuing viability of the bottom longline component of the reef fish fishery, while providing adequate protection to sea turtles (see discussions on page 115). The least restrictive combination, other than No Action (**Alternative 1**) would be **Option a** for each of the alternatives. This combination would prohibit the use of bottom longlines between 27^{o} and 28^{o} N latitude in waters less than 30 fathoms during June-August and would correspond to 7% of SWG longline landings in the Gulf during 2006-2007. The most restrictive, other than a year-round ban of bottom longline gear at all depths in the eastern Gulf, would be **Option c** for **Alternatives 2 and 4** and **Option d** for **Alternative 3**. This combination would prohibit the use of bottom longlines in the whole eastern Gulf in waters less than 50 fathoms year round and would correspond to 91% of SWG longline landings in the Gulf during 2006-2007.

6.2.3 Direct and Indirect Effects on the Economic Environment

The discussion of direct and indirect effects on the economic environment that are expected to result from restrictions on the use of longline gear in the eastern Gulf is preceded by a brief presentation of the assumptions and methodology used to derive expected effort reductions and associated losses in net operating revenues.

Consistent with the determination that the Gulf reef fish bottom longline component of the commercial reef fish fishery is essentially a grouper and tilefish target fishery, as discussed in Section 3.3.1, the following discussion emphasizes these components of the commercial reef fish fishery. However, reported changes in effort measures, harvests, and revenues presented in this section account for all species harvested using bottom longline gear in the appropriate affected region of the Gulf.

This analysis used logbook records from 2005-2007 with recorded landings by bottom longline gear. Statistical areas are restricted in accordance with the bottom longline gear restrictions considered. For **Alternatives 2 (a)**, **2 (b)**, and **2(c)**, trips from statistical areas 5, 4-5, and 1 to 8, are included, respectively.

This analysis did not incorporate all trips and vessels that commercially harvested reef fish using bottom longline gear. Some vessels have both longline and vertical line gear and report landings using both gears. For trips that reported using both gears, this analysis only used those trips where greater than 50% of the value of the landings was reported harvested using longline gear. Although this approach may result in an underestimation of the number of potentially affected trips and associated harvests and revenues, any underestimation is not expected to be substantial because most trips with longline harvests exceeded the 50% threshold. Also, for dual-gear trips where vertical lines accounted for the majority of harvests, the use of both gears but larger vertical line harvests demonstrates a significant flexibility to rely upon vertical line gear under this proposed action and an increased ability to avoid the adverse economic effects of the proposed action.

Based on the characteristics of each relevant trip reported in the logbook records, trips were assumed to either continue to occur and produce historical landings and revenues, or be canceled under the appropriate management scenario. Trip cancellation resulted in the loss of all ex-vessel revenues associated with all species harvested on that trip as well as all costs associated with that trip. The net effects of the resultant combination of continued and cancelled trips were summarized in terms of changes in net operating revenues (NOR). Net operating revenues were calculated as revenues minus variable operating costs. Variable operating costs include all trip costs (fuel, ice, bait, food, etc.) except payments to captain and crew (labor). Therefore, the NOR for a trip is the return used to pay all labor wages, returns to capital, and owner profits. Net operating revenues are reported in nominal dollars (averages over actual values for each year with no standardization to a common base year).

The analysis evaluated the effects of potential gear conversion by affected longline vessels from longline gear to vertical line gear. Conversion rates were modeled to vary from 0% to 100%, in 20% increments. The performance of converted longline trips, in terms of trip length, operating costs, ex-vessel revenues (which equates to harvest success), and NOR was assumed to equal that of historical vertical line trips. This assumption is expected to overestimate the true harvest success that would occur on these converted trips, resulting in an overestimation of the NOR "recovered" as a result of conversion and an underestimation of the net change in economic effects. An alternative data-based assumption of a more realistic harvest profile has not been identified. Gear conversion costs were not included in the analysis. Gear conversion costs to a vertical line bandit reel set-up are estimated at approximately $13,750 per vessel (assumes four reels; R. Spaeth, personal communication). The cost of gear conversion would not be considered a trip cost and, therefore, would not affect the estimated changes in net operating revenues.

In addition to directly affecting vessels with reef fish harvests using bottom longline gear, the proposed alternatives could also affect the harvest success of the traditional vertical line fleet. Although bottom longline vessels are believed to generally fish in different areas than vertical line vessels (successful vertical line fishing is assumed to require more pinpoint accuracy in finding suitable fish aggregations), reduced harvest pressure on the reef fish stocks as a whole as a result of the proposed alternatives could result in increased harvest rates by the vertical line fleet. Alternatively, increased competition from converted bottom longline vessels at sites more suitable to vertical line activity could result in harvest rate declines. While these possibilities are noted, this analysis assumed there would be no change in the harvest rate or economic performance of the vertical line fleet (both historic and converted). Because the actual harvest success that will develop is unknown, the effect of this assumption is unknown.

This analysis does not include any assumed behavioral or performance changes within the historical vertical line fleet. As a result, the economic performance of the historical vertical line fleet under the proposed alternatives would not be expected to change and all reported effects accrue to the longline fleet. Thus, although the analysis allows gear conversion to vertical lines and reports expected increases in vertical line trips, expected changes in NOR provided are borne by longline vessels.

Bottom longline trips are, on average, longer in terms of the number of days fished than vertical line trips. The average bottom longline trip expected to be affected by this action lasted approximately 8.5 days, whereas the average vertical line trip lasted approximately 3.5 days. Imposing the historic profile of vertical line trips on converted bottom longline trips required an assumption on how to deal with the difference in trip length. This analysis applied the alternative gear conversion rates to the number of affected bottom longline days fished, rather than the number of affected trips, then translated the number of converted days fished to an estimated number of trips using the average number of days fished per vertical line trip; for example, 35 converted days fished with bottom longlines would translate into 10 converted vertical line trips using the average of 3.5 days per vertical line trip.

This analysis does not capture the potential effects of temporal or spatial shift of affected bottom longline trips. In theory, instead of gear conversion, a behavioral response to the proposed area and seasonal restrictions could be a shift of bottom longline effort to other areas of the Gulf and/or increased effort during the months when bottom longline gear would not be prohibited. These potential effects were not included in the analysis due to additional simplifying assumptions that would be required and to data limitations. For example, historical logbook data are not reported at the needed spatial resolution to provide reliable estimates of cost structures and CPUE in continuous depth contours. Furthermore, vessels that do not normally fish outside of the 35-fathom depth contour may significantly alter their fishing behavior (e.g., trip length), especially in light of the coinciding hook restrictions. Finally, congestion may be a significant cost if enough vessels move to deeper waters; the costs due to crowding externalities outside of 35-fathoms cannot be measured at this time. Therefore, the analysis relies on a parsimonious gear conversion model to proxy possible movements by the fleet to other areas, e.g., deeper waters. The results presented under the different rates of gear conversion are assumed to adequately allow ranking of the alternatives and approximate lower and upper bounds for the expected economic effects.

All results are based on average fishery behavior as recorded in the logbook data from 2005-2007. The use of averages over this period allows for the incorporation but not overemphasis of unusual fishery events, such as the closure of the SWG fishery at the end of 2005 and the effects of red tide on subsequent catch rates.

In addition to the analytical issues thus far discussed, quota management affected the performance of the grouper component of the commercial reef fish fishery during the period on which this analysis is based (2005-2007), as well as the 2008 and 2009 fishing seasons. Specifically, gag harvests are subject to a quota, as is red grouper and the combined SWG complex and, under current management procedures, once 80% of either the gag or red grouper quota is taken, and 100% of the quota is projected to be reached prior to the end of the fishing year, a 200-pound (gutted weight) trip limit is implemented for the applicable species. If 100% of one of the three quotas is harvested (gag, red grouper, or SWG), then the entire SWG commercial fishery will close for the remainder of the fishing year. The grouper component of the commercial reef fish fishery also operates under a 6,000 trip limit. If the IFQ program approved for the gropuper and tilefish component of the commercial reef fish fishery under Amendment 29 (GMFMC 2008a) is implemented, trip limits would no longer be required This analysis does not include any quantitative estimates of the effects that could result from the elimination of trip limit effects.

This analysis also does not incorporate any other potential effects of the implementation of the IFQ program for the grouper and tilefish component of the commercial reef fish fishery, as described in Amendment 29. IFQ programs generally result in an increase in the value received for fish and NOR to fishery participants. The implementation of this IFQ program is not expected to occur until January 2010 at the earliest. An IFQ program would give bottom longline fishermen the opportunity to actively fish their allocation, sell their allocation, or sell their shares. To actively fish their allocation under the actions considered in this amendment, bottom longline fishermen may need to convert their gear, whereas selling their allocation would not require gear conversion, nor would selling their shares (thereby exiting the grouper and tilefish components of the commercial reef fish fishery). The implementation of an IFQ program would be expected to reduce the economic effects of the actions considered in this amendment due to the expected higher prices and because grouper allocation and shares would represent a sellable asset that the bottom longline participants did not previously have. However, grouper prices and the resultant value of allocation and shares may not be as high as previously expected in the absence of the proposed restrictions on the use of bottom longline gear. As discussed below, reef fish harvests are expected to decline under the proposed actions due to the removal of bottom longline gear, even under a 100% gear conversion. This would be expected to reduce the value of allocation and shares. The full effects of these processes are unknown. Overall, it is simply concluded that the implementation of an IFQ program would be expected to mitigate the projected adverse economic effects of management measures in this amendment by an unknown amount.

Finally, this analysis does not include adjustments to current market or economic conditions. As previously discussed, the analysis is based on fishing results from 2005-2007. The resultant expected changes in the quantity of fish landed and NOR under the proposed alternatives reflect general market and economic conditions from that period. Although current economic conditions are discussed qualitatively, the current general economic decline could have already resulted in reduced demand for seafood products, leading to declines in ex-vessels prices. The ability of vessels to sell their harvests at any price may be affected. This analysis does not capture these considerations and their net effect is unknown. While the regulatory-induced gear conversion of the proposed alternatives would be expected to force an economic inefficiency on the bottom longline conponent of the commercial reef fish fishery, the expected decrease in total reef fish harvests may assist in maintaining price stability, countering the effects of declined demand.

Alternative 1, the no action alternative (status quo), would continue to allow bottom longline fishing east of Cape San Blas year round in waters greater than 20 fathoms. Under this alternative, changes in fishing behavior and economic performance would not be expected to occur. However, levels of interactions between hardshell sea turtles and bottom longline gear and associated hardshell sea turtle takes would be expected to remain high. The magnitude of negative economic impacts that could result from the continued take of threatened hardshell sea turtles is not known. Furthermore, a delay in the implementation of measures reducing interactions between hardshell sea turtles and bottom longline gear could lead to more restrictive management measures at a later date, resulting in greater adverse economic impacts at that time than those of the proposed action.

Remaining management alternatives included in this action consider various prohibitions on the use of bottom longline gear in the Gulf. **Alternatives 2, 3,** and **4** would restrict the use of bottom longline gear to specific areas, depths, and time of the year, respectively. The estimated changes in effort expected to result from these alternatives are presented in Table (6.2.3.1), while the estimated changes in the expected NOR are provided in Table (6.2.3.2). Except where noted, the results presented in Tables 6.2.3.1 and 6.2.3.2 represent expected changes relative to the status quo. As such, the results for each alternative do not incorporate any change encompassed by any other alternative. To be specific, while all alternatives pertain to expected conditions in the eastern Gulf, the results for **Alternative 2 (Options a-c)** apply to all depth zones within the respective specified boundaries and months (i.e., a year-round prohibition), the results for **Alternative 3 (Options a-d)** apply to the entire eastern Gulf and all months, and the results for **Alternative 4 (Options a-c)** apply to the entire eastern Gulf and all depth zones. Thus, the results only support differentiation of the expected economic effects within each alternative across the options considered. The expected effects of the combined suite of preferred options are presented as the final scenario.

Bottom longline trip losses and corresponding decreases in NOR could be partially mitigated by longline fishermen who decide to convert to vertical line gear. It is worth noting that, given current economic conditions, vessels that wish to convert to vertical line gear may not be able to acquire sufficient funds, particularly if they require loans to do so. These funding limitations may be more pronounced in the in the short term. Funds to assist in gear conversion have been made available from the Environmental Defense Fund (EDF), and 40 vessels were in the process of converting their gear as of September 21, 2009, three vessels have completed the process, and EDF hopes to assist a total of 50 vessels (Heather Paffe, EDF, personal communication).

Alternative 2 would only allow the use of bottom longline gear in certain areas of the Gulf. Under **Option a**, bottom longline fishing would be prohibited in the EEZ between 27^{o} and 28^{o} N (approximately Charlotte Harbor to Tarpon Springs). **Option a** would be expected to result in the loss of 411 bottom longline trips per year. Additional vertical line trips resulting from proportional gear conversion would range from an estimated 201 trips with a gear conversion rate of 20% to a maximum of 1,005 extra vertical line trips if all affected longline effort is converted to vertical line trips. If no gear conversion occurs, the implementation of **Alternative 2 – Option a** would be expected to result in NOR losses of approximately \$2.9 million. If affected vessels elect to mitigate these losses by conversion to vertical line gear, the resultant losses in NOR would be expected to range from approximately \$2.6 million (20% conversion) to approximately \$1.4 million (100% conversion).

Table 6.2.3.1. Expected Changes in Longline (LL) and Vertical Line Effort (Trips)

Alternative	Longline Trip Lost	Vertical Line Trips Percent Gear Conversion					
		0%	20 %	40 %	60 %	80 %	100 %
Alt 2a: No LL between 27 - 28 N	411	0	201	402	603	804	1,005
Alt 2b: No LL between 26 - 28 N	674	0	309	618	927	1,236	1,545
Pref Alt 2c: No LL in Eastern Gulf	1,238	0	609	1,219	1,827	2,436	3,045
Alt 3a: No LL in less than 30 fathoms	619	0	308	616	924	1,232	1,540
Pref Alt 3b: No LL in less than 35 fathoms	762	0	371	742	1,113	1,484	1,855
Alt 3c: No LL in less than 40 fathoms	905	0	441	882	1,323	1,764	2,205
Alt 3d: No LL in less than 50 fathoms	1,022	0	495	990	1,435	1,880	2,325
Pref Alt 4a: No LL June to August	349	0	167	333	500	666	833
Alt 4b: No LL April to August	601	0	294	587	881	1,175	1,468
Alt 4c: No LL year-round	1,238	0	609	1,219	1,827	2,436	3,045
All Preferred (Alt 2c – Alt 3b – Alt 4a)	**243**	**0**	**109**	**219**	**327**	**437**	**545**

Table 6.2.3.2. Estimated Reductions in Net Operating Revenues (Thousands, Nominal $)

Alternative	Percent Gear Conversion					
	0%	**20 %**	**40 %**	**60 %**	**80 %**	**100 %**
Alt 2a: No LL between 27 - 28 N	$2,901	$2,602	$2,303	$2,004	$1,705	$1,406
Alt 2b: No LL between 26 - 28 N	$4,766	$4,307	$3,848	$3,388	$2,929	$2,470
Pref Alt 2c: No LL in Eastern Gulf	$8,635	$7,678	$6,720	$5,763	$4,805	$3,848
Alt 3a: No LL in less than 30 fathoms	$3,859	$3,375	$2,892	$2,408	$1,924	$1,441
Pref Alt 3b: No LL in less than 35 fathoms	$4,921	$4,340	$3,758	$3,177	$2,596	$2,014
Alt 3c: No LL in less than 40 fathoms	$6,106	$5,414	$4,721	$4,029	$3,336	$2,644
Alt 3d: No LL in less than 50 fathoms	$6,911	$6,135	$5,359	$4,583	$3,807	$3,031
Pref Alt 4a: No LL June to August	$2,085	$1,823	$1,561	$1,299	$1,037	$775
Alt 4b: No LL April to August	$4,109	$3,647	$3,185	$2,723	$2,261	$1,800
Alt 4c: No LL year-round	$8,635	$7,678	$6,720	$5,763	$4,805	$3,848
All Preferred (Alt 2c – Alt 3b – Alt 4a)	**$1,353**	**$1,181**	**$1,010**	**$838**	**$667**	**$495**

Alternative 2 - Option b would prohibit the use of bottom longline gear in the EEZ between 26^o and 28^o N (approximately Naples to Tarpon Springs). Due to the larger area covered by the prohibition considered in **Alternative 2 – Option b**, the losses in bottom longline trips and corresponding NOR are expected to be greater than those associated with **Option a**. Bottom longline fishing effort would be expected to decrease by 674 trips under **Alternative 2 – Option b**, while the expected reduction in NOR would be approximately $4.8 million, assuming no gear conversion. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 309 to 1,545 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $4.3 million and $2.5 million.

Alternative 2 – Preferred Option c would extend the prohibition on the use of bottom longline gear to the entire eastern Gulf EEZ. This option would effectively shut down longline fishing activities in the eastern Gulf. Compared to **Options a** and **b**, **Preferred Option c** would be expected to correspond to the greatest decline in bottom longline effort and loss of NOR. **Alternative 2- Preferred Option c** would be expected to result in the loss of 1,238 bottom longline trips and associated NOR of approximately $8.6 million, assuming no gear conversion. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 609 to 3,045 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $7.7 million and $3.8 million.

Alternative 3 would limit interactions between bottom longline gear and hardshell sea turtles by restricting bottom longline fishing activities to specific depths. The bottom longline component of the reef fish fishery is currently authorized to operate in water depths greater than 20 fathoms. Options under consideration would prohibit the use of bottom longline gear to harvest reef fish in the eastern Gulf in water depths less than 30 fathoms to less than 50 fathoms. **Alternative 3 - Option a** would prohibit bottom longline fishing inside the 30 fathom contour and would be expected to result in the loss of 619 bottom longline trips and approximately $3.9 million in NOR, assuming no gear conversion. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 308 to 1,540 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $3.4 million and $1.4 million.

Alternative 3 – Preferred Option b would move the bottom longline component of the reef fish fishery to water depths greater than 35 fathoms. **Alternative 3 – Preferred Option b** would be expected to result in the loss of 762 bottom longline trips and approximately $4.9 million in NOR, assuming no gear conversion. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 371 to 1,855 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $4.3 million and $2.0 million.

Alternative 3 - Option c would extend the prohibition on bottom longline gear to 40 fathom water contour. Assuming no gear conversion, **Alternative 3 - Option c** would be expected to result in the loss of 905 bottom longline trips and approximately $6.1 million in NOR. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 441 to 2,205 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $5.4 million and $2.6 million.

Alternative 3 - Option d would prohibit bottom longline fishing for reef fish inside waters less than 50 fathoms and would be expected to impact the bottom longline component of the reef fish fishery to a greater extent than **Options a, b,** and **c.** A majority of bottom longline trips in the commercial reef fish fishery occur within 50 fathoms. Assuming no gear conversion, **Alternative 3 - Option d** would be expected to result in the loss of 1,022 bottom longline trips and approximately $6.9 million in NOR. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 495 to 2,325 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $6.1 million and $3.3 million.

While most observed hardshell sea turtle takes by bottom longline gear occurred in waters less than 40 fathoms, the deeper the waters in which the bottom longline vessels operate, the smaller the expected likelihood of interaction between hardshell sea turtles and bottom longline gear. The economic value attached to the reduction of interactions between bottom longline gear and hardshell sea turtles is unknown and could not be quantified for this amendment. Therefore, a quantitative comparison between costs borne by the bottom longline vessels and the potential benefits derived from reducing interactions between hardshell sea turtles and longline gear could not be included in this analysis.

Alternative 4 would impose seasonal or permanent closures of bottom longline fishing activities. **Preferred Option a** and **Option b** would prohibit the use of bottom longline gear between June and August and between April and August, respectively. **Preferred Option a**, which is a subset of **Option b**, would be expected to result in smaller losses in bottom longline effort and associated NOR than Option a. The expected reductions in longline effort associated with **Preferred Option a** and **b** are estimated at 349 and 601 longline trips, respectively. Under **Preferred Option a** and **Option b,** assuming no gear conversion, the reductions in NOR would be expected to be approximately $2.1 million and $4.1 million, respectively. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 1,676 to 833 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $1.8 million and $775,000 for **Alternative 4 – Preferred Option a**. For **Alternative 4 – Option b**, gear conversion to mitigate these losses would be expected to result in the generation of an estimated 294 to 1,468 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $3.6 million and $1.8 million.

Alternative 4 – Option c would impose a year-round prohibition on the use of bottom longline gear in the eastern Gulf. In effect, **Option c** would shut down the bottom longline component of the commercial reef fish fishery in the eastern Gulf and would be expected to result in a loss of 1,238 bottom longline trips and approximately $8.6 million in NOR. Gear conversion to mitigate these losses would result in the generation of an estimated 609 to 3,045 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $7.7 million and $3.8 million.

Overall, the preferred alternatives and options in this action would prohibit the use of bottom longline gear in the eastern Gulf (**Alternative 2 – Preferred Option c**) in waters less than 35 fathoms deep (**Alternative 3 – Preferred Option b**) between June and August (**Alternative 4 – Preferred Option a**). The set of preferred alternatives and options selected by the Council would be expected to result in the loss of 243 bottom longline trips. Without loss mitigation through gear conversion, the expected reduction in NOR would be approximately $1.36 million. Gear conversion to mitigate these losses would be expected to result in the generation of an estimated 109 to 545 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate expected reductions in NOR would be approximately $1.2 million and $500,000.

In addition to the expected reductions in NOR anticipated under these alternatives, the projected reductions in fishing trips would also be expected to result in additional reductions in economic activity associated with trip costs. Although not quantified, the loss of these expenditures is most obvious and would be most severe if no bottom longline vessels convert to vertical line gear. Not only would NOR be reduced, which represent captain and crew wages and owner profits, but all operating costs for fuel, bait, ice, food, trip-related gear costs, etc., would not be spent, adversely affecting associated industries. As the rate of gear conversion increases, expenditure flows would recover. However, while some of these expenditure sectors may actually benefit from such conversion, others may not and overall economic disruption would be expected. As discussed above, the estimated cost to convert a longline vessel to bandit gear is approximately $13,750. Assuming that between 110 and 150 vessels converted their gear, the estimated total cost to the fleet would be approximately $1.51-$2.06 million. This may overestimate the actual cost as some vessels with bottom longline gear have both gears already on board, though not necessarily in the full arrangement that a completely converted vessel would have. While this conversion expenditure would be expected to benefit the appropriate suppliers and installers, it would represent a substantial new cost to the industry, one they may not have sufficient funds to pay for, and may have difficulty obtaining through loans. It should also be noted that vessels with bottom longline gear have a substantial financial investment in their current gear, which would be essentially useless except for the more limited harvest opportunities in the DWG and tilefish fisheries.

Overall, the net economic effect of these reductions could be substantial. Employment at multiple levels in the economy could be affected, worsening an already difficult situation due to the current general economic decline. Although the duration of the prohibition would be limited, the severity of the possible disruptions could have long-term implications as some affected entities may not be able to economically survive. This would include both fishing vessels/businesses and infrastructure businesses. Closure of a dealer, processor, or supplier due to reduced reef fish landings as a result of this action would affect not only longline vessels and these dealers, processors, or suppliers, but also the participants in all other fisheries or gear sectors that deal with these businesses.

6.2.4 Direct and Indirect Effects on the Social Environment

Action 2, restricting the longline component in the eastern Gulf has been a contentious issue for many years as mentioned earlier with regard to Secretarial Amendment 1. Alternative 1 would have few social impacts as the fishery could be prosecuted as it has in the past. However, if hardshell sea turtle interactions were not reduced through other alternatives more restrictive actions may be needed. Alternative 2 would likely have significant social impacts requiring a variety of changes in fishing behavior depending upon the option chosen. Options a and b would force longline vessels to fish in other areas or switch to another gear option such as vertical line but are less restrictive with regard to area fished than Preferred Option c.

The ability to switch to another gear may be practical for a limited subset of vessels according to industry representatives but it may not be feasible for the larger vessels to be retrofitted with vertical line gear (G. Brooks and K. Bell, personal communication). Preferred Option c would have the most significant impact but would also allow for vessels to switch gear. It is not known how many vessels would be capable of changing to vertical line gear, although it has been estimated that approximately 50 vessels may receive financial assistance from environmental groups to mitigate the transition.

There may also be a reduction in the labor force required in the fishery as vertical line vessels routinely have fewer crew on board than longline vessels. While finding crew has been difficult in the past, with the recent economic downturn one vessel owner stated that there has been increased activity on the docks with individuals seeking work as crew members on board fishing vessels in the area (G. Brooks, personal communication).

Another difficulty in switching to vertical line gear is that setting out a longline over several miles takes a different skill set than anchoring a vessel in a specific location. Captains of vertical line vessels must be adept at setting an anchor such that the tide and currents will place the vessel in the exact location near the desired bottom type. Any miscalculation can impact the catch significantly. Some captains are unable to successfully make that transition and have difficulty making profitable fishing trips while learning new fishing skills (G. Brooks, personal communication).

Furthermore, the costs of retrofitting vessels with vertical line gear and the loss of product as a result of lower catch rate may have significant impacts upon fish houses that own a fleet of vessels. Some industry representatives have suggested that with current economic conditions and other regulatory actions, the alternatives in Action 2 may force them to go out of business (R. Spaeth and K. Bell, personal communication). While the majority of grouper are landed within a localized area along Florida's west coast, the majority of product is marketed throughout the southeast region primarily in Georgia and Florida according to industry representatives (Lucas 2001).

Alternative 3 would have varying impacts depending upon which option is chosen. Option a would have the least impact as the majority of longline sets and trips are beyond 30 fathoms, yet between 20% and 40% of trips could be affected. As the options move outward in depth zones as in Preferred Option b, the impacts will be greater as the number and percentage of longline trips that are impacted increases. Again, if longline fishing is pushed out beyond the 40 or 50 fathom mark in Option c and d respectively, the majority of current longline fishing will be prohibited. As with other actions in this amendment the longline fleet could switch to vertical line gear to mitigate the impacts, although the costs and skills would again place barriers to that transition for some. If the most restrictive alternatives and options are chosen the impacts to the regional industry could be substantial.

As mentioned, some within the fishery see these actions as having possible dramatic impact not only affecting the longline component, but also the bait fishery that provides a considerable amount of bait to longline vessels. Whether sufficient numbers of vessels could transition to vertical line gear and maintain a comparable volume of product to the fish houses is unknown. The anticipated impacts would go beyond vessels and have impacts on wholesale and retail markets and restaurants who would need to find substitutes for the lost product. While imports may be substitutable in some cases, some dealers would be unable to replace the market for fresh domestic grouper with imported seafood.

Furthermore, if there is a substantial shift to imported product, the need for a waterfront facility may be less significant. A move to facilities further inland may provide reduced costs in terms of taxes and other expenses that are normally associated with a waterfront facility, thereby providing the impetus for the move once there is no longer the need to offload vessels as imports become the primary product. Yet, this loss of infrastructure would have further implications for remaining vessels and operators, not to mention the fishing community as a whole as there would be some loss of employment opportunities and other amenities that accrue from having a working waterfront. Research has shown that residents of fishing communities often value and overestimate the economic contribution of working waterfronts to their community highlighting the cultural importance of such infrastructure (Jacob et al. 2005).

Alternative 4 would prohibit longline gear during specific times of the year with Option a (June-August) the preferred. This seasonal closure is the least restrictive and would likely have a lesser impact on markets. Option b with a closure from April-August would impose a slightly longer seasonal closure which could impact landings as weather may be more of a factor in the early spring months than in early summer. The longer closure may have an effect on markets if dealers and others need to rely on other species or imports which may make it more difficult for the domestic product to remain competitive. With the year-round closure under Option c, it is likely that there will be some exodus by harvesters, especially those who are unable to convert to other gear types. There would also likely be a number of dealers who would no longer remain in business, but the extent of impact is unknown. Those that remain would likely increase their purchase of imported product or substitute other species if available.

The Preferred set of Alternatives and Options offered under **Action 2 (Alternative 2, Option c; Alternative 3, Option b; and Alternative 4 Option a)** were the result of negotiations between industry and environmental non-governmental organizations and presented to the Council as a suite of suitable alternatives during a previous council meeting. This suite of alternatives was offered in conjunction with a proposal for endorsements to fish east of Cape San Blas which will be discussed under the following action. When combined with the next preferred alternatives in **Action 3**, there could be a significant reduction in the fleet of longline vessels capable of fishing in that region of the Gulf. Under this action with the preferred alternatives, there would likely be some redirection of effort with some vessels retrofitting to bandit reel gear while others may be forced out of the fishery. The extent that this would happen is unknown and would be closely tied to **Action 3** and the options chosen for the endorsements.

The most restrictive set of alternatives and options would be **Alternative 2, Option c; Alternative 3, Option d and Alternative 4, Option c**. While this set of alternatives and options would certainly reduce the interactions between hardshell sea turtles and the longline fleet, the impact to the industry would be substantial. This set of alternatives would likely place many vessel operators and fish houses out of business. Furthermore, because we do not know the extent of the economic downturn and how resilient or vulnerable many of these coastal communities may be, the extent of the impacts of this set of alternatives is unknown. However, it would likely close several businesses and put numerous others out of work.

6.2.5 Direct and Indirect Effects on the Administrative Environment

Impacts on the administrative environment under **Alternative 1** would remain the same as current levels. However, this alternative will continue to create administrative conflicts in determining appropriate management measures for the bycatch of hardshell sea turtles.

Alternative 2 would involve an increase in law enforcement in the areas where longline fishing is restricted. As of May 6, 2007, all commercial reef fish vessels were required to have a functioning VMS, which can assist law enforcement with monitoring fishing activities. Closed areas may require increased analysis of the VMS information for potential violations. Enforcement could be particularly difficult near the boundaries. However, other closed areas in the Gulf, such as Steamboat Lumps, require similar monitoring and enforcement.

Alternative 3 would require the enforcement of a different fathom line rather than the current 20-fathom line. A 50-fathom line could actually decrease the enforcement burden because the depth boundary would be the same throughout the Gulf. The differences in distance from the coast and the size of the closed area may increase cost associated with enforcement due to fuel, time, and vessel costs. Some vessels would have both longline and vertical line gear on board, and vessels longline fishing in open areas would need to cross closed areas to reach shore.

Regulations for Madison and Swanson sites and for Steamboat Lumps require stowage of longline gear while transiting the area; transit means non-stop progression through the area. Similar regulations would need to be developed and enforced for any options under **Alternative 3**.

Alternative 4 Options a and **b** would have similar enforcement requirements as closed areas in **Alternatives 2 and 3**. Closures for limited times often create confusion among fishers as to when fishing is legal. **Option c** would be the easiest of the three options to enforce because regulations would remain constant.

For **Alternatives 2-4**, enforcement would be complicated because vertical line fishing would be allowed in areas or at times when longline fishing was prohibited. For this reason, enforcement would need to occur on the water, rather than at the dock. Each of these alternatives would also require monitoring and research to determine the extent of reductions in hardshell sea turtle bycatch and bycatch mortality. Additional monitoring required for hardshell sea turtle bycatch may include continued observer monitoring and logbook analysis. Further, any combination of alternatives and options could change the level of administrative impacts.

6.3 Action 3: Longline Endorsements

6.3.1 Direct and Indirect Effects on the Physical Environment

Alternatives for this action could have direct effects on the physical environment by influencing the total number of longline fishers and how the fishery is prosecuted. Endorsement programs are intended to reduce effort in the longline fisheries. Impacts on the physical environment would decrease with fewer vessels using bottom longline gear thereby reducing interactions of gear with the bottom habitat. Bottom longline fishers set the gear on or near the bottom where it may interact with the habitat. The potential for adverse impacts is dependent on the type of habitat the gear is set on, the presence or absence of current, and the behavior of fish after being hooked. In addition, lines can drag across the surface for considerable distances during retrieval and dislodge lightweight organisms such as invertebrates. Both longlines and handlines can entangle on corals and other hard bottom and cause physical damage. Anchors or weights on bottom longlines can also impact and damage the bottom habitat (Barnette 2001).

Alternative 1 would maintain current regulations and thereby maintain the current level of impact on the physical environment. **Alternatives 2, 3, 4, 5, 6,** and **7** will decrease the number of active vessels in the longline component and therefore should decrease adverse impacts on the physical environment. However, the criteria for participation in either program will influence the level of the reduction in impacts. Less restrictive criteria could result in smaller reductions in the number of vessels in the fishery.

6.3.2 Direct and Indirect Effects on the Biological Environment/Ecological Environment

Alternative 1 would maintain the same level of biological impacts currently in the fishery. Under **Alternative 1**, current levels of incidental catches of non-targeted reef fish species and bycatch of other species including hardshell sea turtles by bottom longline gear are expected to remain unchanged.

Action 3 could reduce interactions between hardshell sea turtles and longline gear by reducing the number of participants in the longline component of the reef fish fishery. The endorsement program in **Alternatives 2, 3, 4, 5, and 6** with **Options a** and **b** for different qualifying years could limit incidental catches of non-targeted reef fish species and bycatch of other species including hardshell sea turtles. The qualifying years for **Preferred Option b**, (i.e., 1999-2007) is a longer time period than **Option a** (1999-2004). The number of permits that qualify in 1999-2004 and 1999-2007 are similar, but there are a slightly lower number of participants under **Preferred Option b** for the higher (i.e., greater than 30,000 pounds) qualifier. **Preferred Alternative 4 Option b** would allow 61 vessels to continue to harvest reef fish using bottom longline gear in the eastern Gulf. Expected reductions in effort could directly impact the biological and ecological environment. Reductions in fishing effort and the rate of bycatch would benefit target and non-target species, as well as the habitat within which they occur. With fewer participants, the bottom longline component of the reef fish fishery may have reduced interactions with hardshell sea turtles. **Alternative 6** has the highest annual average landing qualifying criterion of 60,000 pounds gutted weight versus **Alternative 2** that requires an annual average of 20,000 pounds gutted weight. Therefore **Alternatives 6, 5, 4, 3** and **2** will likely reduce participation in the fishery and biological impacts because generally, the effort applied to the fishery can be expected to decrease as participation is consolidated among fewer individuals. **Alternative 7** would also reduce the participation in the fishery. The number of permits that could qualify for an endorsement to fish east of Cape San Blas, is expected to be somewhere between the number under **Preferred Alternative 4** and **Alternative 5**. This decreased effort would result in less gear and time used in pursuing targeted reef fish and consequently, less adverse impacts in the form of discards and bycatch of non-target species, including hardshell sea turtles. Under various effort shifting scenarios the **Preferred Alternative 4** alone could reduce effective effort between 18-37% and therefore sea turtle interactions with bottom longline gear (NMFS 2009c).

Some fishermen that do not qualify for the longline endorsement program using fish traps or longline gear under **Preferred Alternative 4 Option b** may shift fishing effort to vertical line gear. This shift in effort could have positive effect on the biological and ecological environment. For instance, interactions with vertical line gear and hardshell sea turtles were not as frequently documented. For example, the RFOP sent observers on 93 vertical line trips, without recording any hardshell sea turtle takes (NMFS-SEFSC 2008). A hardshell sea turtle that is incidentally hooked by vertical line gear, usually can still reach the surface to breathe reducing the number of mortality incidents with this fishing gear (see Section 6.2.2 for a discussion of biological and ecological effects on hardshell sea turtles).

Combining the **Preferred Alternative** in this **Action 3** with the **Preferred Altneratives** of **Action 2** would further reduce potential interactions between longlines and hardshell sea turtles. For example, the Council has chosen preferred alternatives to prohibit the use of bottom longline gear in waters shoreward of the 35 fathom depth contour during June-August in addition to a longline endorsement with a 40,000 pound qualifying threshold. Table 6.3.2.1 shows the decrease in SWG landings that would be associated with this combination of restrictions depending on the various scenarios of effort shifts. Two types of effort shift could occur. First, vessels that have traditionally used longline gear but did not qualify for an endorsement could shift to vertical line gear. Second, vessels that qualify for an endorsement could shift to deeper areas during June-August and continue to use longline gear. Although landings would decrease for most shallow-water species, catch of gag is higher with vertical line gear so landings could increase under some circumstances (Table 6.3.2.2).

Table 6.3.2.1. Percent change (relative to 2005-2007 average) in SWG landings given proportional transition of non-endorsed longline vessels into vertical line component, and proportional transition of endorsed longline vessels (40,000-pound threshold) into deeper waters during the June-August closure within 35 fathoms (NMFS 2009a). Negative numbers are reductions, positive numbers are increases.

	Effort shift to vertical line gear					
Effort shift to deeper water	0	0.2	0.4	0.6	0.8	1.0
0	-24.5	-21.6	-18.7	-15.8	-12.9	-10.0
0.2	-23.0	-20.1	-17.2	-14.3	-11.5	-8.6
0.4	-21.5	-18.6	-15.7	-12.9	-10.0	-7.1
0.6	-20.0	-17.1	-14.3	-11.4	-8.5	-5.6
0.8	-18.5	-15.7	-12.8	-9.9	-7.0	-4.1
1.0	-17.1	-14.2	-11.3	-8.4	-5.5	-2.6

Table 6.3.2.2. Percent change (relative to 2005-2007 average) in gag landings given proportional transition of non-endorsed longline vessels into vertical line component, and proportional transition of endorsed longline vessels (40,000-pound threshold) into deeper waters during the June-August closure within 35 fathoms (NMFS 2009a). Negative numbers are reductions, positive numbers are increases.

	Effort shift to vertical line gear					
Effort shift to deeper water	0	0.2	0.4	0.6	0.8	1.0
0	-13.7	-10.8	-7.8	-4.9	-1.9	+1.0
0.2	-12.0	-9.0	-6.1	-3.1	-0.1	+2.8
0.4	-10.2	-7.2	-4.3	-1.3	+1.6	+4.6
0.6	-8.4	-5.5	-2.5	+0.4	+3.4	+6.3
0.8	-6.7	-3.7	-0.8	+2.2	+5.1	+8.1
1.0	-4.9	-1.9	+1.0	+4.0	+6.9	+9.9

Any shift in effort from longline to vertical line gear could result in increases in catch of other species as well. Greater amberjack and gray triggerfish are undergoing overfishing and have a higher catch with vertical line gear. Any substantial increase in catch could threaten rebuilding plans for these species. For example, under the combination of preferred alternatives for **Actions 2** and **3**, a 100% shift of non-endorsed longline vessels to vertical line gear and a 100% shift of endorsed longline vessels to deeper water during the closed months would result in a 40% increase in landings of greater amberjack and an 11% increase in landings of gray triggerfish. However, with no effort shift, catch of greater amberjack would decrease 8% and catch of gray triggerfish would decrease 3% relative to 2006-2007 averages.

Further analysis was completed (NMFS 2009c) to estimate the expected reduction in hardshell sea turtle interactions with bottom longline gear based on **Actions 2** and **3**. These analyses of commercial logbook data indicate that various combinations of the depth closure and endorsement alternatives may achieve significant reductions in effective effort that impact sea turtle takes by the bottom longline component of the reef fish fishery in the eastern Gulf of Mexico. As with any model, the outcomes are sensitive to the assumptions.

For the cumulative effects analysis used to determine effective effort impacting sea turtle takes, effort was computed as hooks-per-set times the number of sets per trip. Effort in this analysis is referred to as 'effective effort', because it is based upon the number of hooks in use in the fishery sector, and a reduction of hooks is used as a proxy for sea turtle bycatch reduction. A major assumption of the model is that reducing the number of hooks will lead to reduced sea turtle bycatch. This is a common assumption in sea turtle bycatch studies (Johnson et al. 1999, Richards 2007, Walsh and Garrison 2006, NMFS-SEFSC 2008; 2009).

Overall, results of this analysis suggest that large reductions in effort, and corresponding sea turtle takes, would occur by combining longline endorsements (**Action 3**) and area closures (**Action 2**). There is a large amount of uncertainty surrounding the reduction estimates presented, given that fisherman behavior is difficult to predict. Sources of uncertainty are numerous and include: depth of fishing reported; sea turtle density estimates; potential changes in grouper quotas and how those changes will affect effort; and implementation of the IFQ program, which is expected to result in consolidation and modifications in effort levels. Given these uncertainties, the analyses indicate endorsements will result in greater reductions in effort than seasonal or year-round area closures inside 35 fathoms. Assuming all endorsed vessels move to deeper water during a summer closure inside 35 fathoms, annual average landings of 40,000 pounds gutted weight would reduce effort and corresponding sea turtle takes by 30-49%, depending upon the duration of the closure and assumptions regarding increases in effort. The combined **Preferred Alternatives** of **Actions 2** and **3** could reduce effective effort and corresponding sea turtle takes by 30-45% if all of the effort shifts to deeper water during the closure. Similarly, the combined **Preferred Alternatives** of **Actions 2** and **3** could reduce effective effort and corresponding sea turtle takes between 32-47%, if 50% of the effort shifted to deeper waters during the 35 fathom depth closure (NMFS 2009c). The ranges in the percent reduction expected from these two combined actions are based on various effort scenarios projected in the cumulative effects analysis (NMFS 2009c).

The mean, lower, and upper estimates for percent reductions from the 2007-2008 are shown in Table 6.3.2.3 for the constant effort scenario, and in Table 6.3.2.4 for the increasing effort scenario. These tables provide information for all closures under the three effort shifting scenarios (e.g., 100%, 75%, and 50%) to deep water and the mean, lower, and upper limits of the ratios of sea turtle population densities. Additionally, the tables provide information for three of the scalars investigated under the 35-fathom annual closure scenarios. Note that non-endorsed effort is excluded from the increased effort scenarios presented in Table 6.3.2.4, under the assumption that effort will only potentially increase on a per-vessel basis if a substantial proportion of the vessels in the fishery are eliminated through an endorsement action (NMFS 2009c).

Table 6.3.2.3. Percent reductions in effective effort in eastern Gulf of Mexico (areas 1-10) bottom longline component of the reef fish fishery impacting sea turtle take from 2007-2008 baseline under various proposed Alternatives from Actions 2 and 3 in Amendment 31, assuming constant effort. Source: NMFS 2009c

CONSTANT EFFORT			ENDORSEMENT LEVEL											
			None			40K			50K			60K		
		Effort Shift	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE
35-FATHOM CLOSURE	None	n/a		0%			37%			54%			74%	
35-FATHOM CLOSURE	Jun-Aug	100%	7	**14%**	17	41	**45%**	47	56	**59%**	60	75	**77%**	77
		75%	10	**15%**	17	42	**46%**	47	57	**59%**	60	76	**77%**	77
		50%	13	**16%**	18	44	**47%**	47	59	**60%**	61	77	**77%**	78
	Apr-Aug	100%	10	**20%**	25	43	**49%**	52	57	**61%**	63	76	**78%**	79
		75%	15	**22%**	26	45	**50%**	52	59	**62%**	64	77	**78%**	79
		50%	19	**24%**	27	48	**51%**	53	61	**63%**	64	78	**79%**	79
	Annual (W=0.636, S=0.296)	100%	5	**32%**	45	39	**56%**	64	55	**66%**	72	75	**80%**	83
		75%	18	**39%**	48	47	**60%**	66	60	**69%**	73	77	**81%**	83
		50%	31	**44%**	51	56	**64%**	68	66	**72%**	74	80	**83%**	84
	Annual (W=0.296, S=0.296)	100%	19	**40%**	49	49	**61%**	67	62	**70%**	74	78	**82%**	84
		75%	28	**44%**	51	54	**64%**	68	65	**72%**	75	80	**83%**	84
		50%	38	**48%**	53	60	**66%**	69	69	**74%**	76	81	**84%**	85
	Annual (W=0, S=0.296)	100%	34	**46%**	52	58	**66%**	69	69	**73%**	75	81	**83%**	84
		75%	40	**49%**	53	62	**67%**	70	71	**74%**	76	82	**84%**	85
		50%	45	**51%**	54	65	**69%**	70	73	**75%**	76	83	**84%**	85
50-FATHOM CLOSURE	Jun-Aug	100%	24	**24%**	24	51	**51%**	51	63	**63%**	63	79	**79%**	79
		75%	25	**25%**	25	52	**52%**	52	64	**64%**	64	79	**79%**	79
		50%	25	**25%**	25	52	**52%**	52	64	**64%**	64	80	**80%**	80
	Apr-Aug	100%	35	**35%**	35	58	**58%**	58	68	**68%**	68	81	**81%**	81
		75%	37	**37%**	37	59	**59%**	59	69	**69%**	69	82	**82%**	82
		50%	40	**40%**	40	61	**61%**	61	70	**70%**	70	83	**83%**	83

Note: 'Constant effort' assumes no increase in effort from 2007-2008 average. 'LE' denotes lower estimate; 'UE' denotes upper estimate based on 95% confidence interval in ratio of sea turtle population density. 'S' denotes summer scalar ratio for sea turtle density; 'W' denotes winter (Garrison 2009).

Table 6.3.2.4. Percent reductions in effective effort in eastern Gulf of Mexico (areas 1-10) bottom longline component of the reef fish fishery impacting sea turtle take from 2007-2008 baseline under various proposed Alternatives from Actions 2 and 3 in Amendment 31, assuming increased effort given elimination of some competition through implementation of endorsement. Source: NMFS 2009c

INCREASED EFFORT			ENDORSEMENT LEVEL								
			40K			50K			60K		
		Effort Shift	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE
	None	n/a		**18%**			**41%**			**66%**	
35-FATHOM CLOSURE	Jun-Aug	**100%**	23%	**30%**	33%	45%	**49%**	50%	68%	**70%**	71%
		75%	26%	**31%**	33%	46%	**49%**	51%	69%	**70%**	71%
		50%	29%	**32%**	34%	48%	**50%**	51%	70%	**71%**	71%
	Apr-Aug	**100%**	26%	**35%**	39%	46%	**52%**	54%	68%	**71%**	72%
		75%	30%	**37%**	40%	49%	**53%**	55%	70%	**72%**	73%
		50%	34%	**38%**	41%	51%	**54%**	55%	71%	**72%**	73%
	Annual (W=0.636, S=0.296)	**100%**	22%	**45%**	56%	44%	**59%**	66%	67%	**74%**	78%
		75%	33%	**50%**	59%	51%	**62%**	67%	71%	**76%**	79%
		50%	44%	**56%**	61%	58%	**65%**	69%	74%	**78%**	79%
	Annual (W=0.296, S=0.296)	**100%**	34%	**52%**	60%	52%	**63%**	68%	71%	**76%**	79%
		75%	42%	**55%**	61%	57%	**65%**	69%	73%	**78%**	79%
		50%	50%	**59%**	63%	62%	**67%**	70%	76%	**79%**	80%
	Annual (W=0, S=0.296)	**100%**	47%	**57%**	62%	60%	**67%**	70%	75%	**78%**	80%
		75%	51%	**59%**	63%	63%	**68%**	70%	77%	**79%**	80%
		50%	56%	**62%**	64%	66%	**69%**	71%	78%	**80%**	80%
50-FATHOM CLOSURE	Jun-Aug	**100%**	39%	**39%**	39%	54%	**54%**	54%	73%	**73%**	73%
		75%	39%	**39%**	39%	55%	**55%**	55%	73%	**73%**	73%
		50%	40%	**40%**	40%	55%	**55%**	55%	73%	**73%**	73%
	Apr-Aug	**100%**	47%	**47%**	47%	60%	**60%**	60%	75%	**75%**	75%
		75%	49%	**49%**	49%	62%	**62%**	62%	76%	**76%**	76%
		50%	51%	**51%**	51%	63%	**63%**	63%	78%	**78%**	78%

Note: 'Increased effort' assumes remaining (e.g., endorsed) vessels will increase their effort to 2003 levels due to lack of competition; no endorsement scenario not shown due to this assumption. 'LE' denotes lower estimate; 'UE' denotes upper estimate based on 95% confidence interval in ratio of sea turtle population density. 'S' denotes summer scalar ratio for sea turtle density; 'W' denotes winter (Garrison 2009).

6.3.3 Direct and Indirect Effects on the Economic Environment

Alternative 1, the no action alternative (status quo), would not establish a longline endorsement to the reef fish permit. Therefore, under **Alternative 1**, interactions between hardshell sea turtles and bottom longline gear would not be reduced. While the status quo would not be expected to result in an adverse economic effect on the bottom longline component of the reef fish fishery in the short term, delay in the implementation of adequate measures to reduce hardshell sea turtle and bottom longline gear interactions could lead to more restrictive management measures in the future, resulting in greater adverse economic impacts at that time.

Estimates of the expected reductions in total (fleet-wide) annual NOR for vessels historically operating in the bottom longline component of the reef fish fishery are provided in Table 6.3.3.1. The methods and assumptions used to derive the estimated changes in NOR are provided in Section 6.2.3. The estimates incorporate considerations of historic fishery performance for different periods of time, 1999-2004 and 1999-2007, respectively, and proportional rates of effort conversion into vertical line trips, ranging from 0 to 100% of affected trips in 20% increments.

Alternative 2 would require minimum annual average annual reef fish landings using fish traps or longline gear of 20,000 pounds per permit to qualify for a longline endorsement. **Alternative 2** would be expected to reduce the number of longline operators in the commercial reef fish fishery in the Gulf to 117 and 118 based on landings history for 1999-2007 and 1999-2004, respectively, and potentially reduce longline effort (measured in trips) by approximately 26%; the corresponding expected reduction in reef fish landings by this sector would be approximately 14% (see Tables 2.3.1 and 2.3.2). These potential reductions in landings could be mitigated if longline operators who do not qualify for an endorsement convert their gear and enter the vertical line sector of the fishery. If no gear conversion occurs, annual NOR under **Alternative 2** would be expected to be reduced by approximately $1.22 million and $656,000 under 1999-2004 and 1999-2007 fishery performance conditions, respectively. If all affected vessels convert to vertical line gear, these projected reductions in annual NOR would be expected to be reduced to $383,000 and $114,000, respectively.

Table 6.3.3.1. Expected Reductions in Net Operating Revenues ($1,000)

Alternative	Reductions in Net Operating Revenue Percent Gear Conversion					
	0%	20%	40%	60%	80%	100%
Alt 2a: 20,000 lbs. minimum (1999-2004)	$1,223	$1,055	$887	$719	$551	$383
Alt 2b: 20,000 lbs. minimum (1999-2007)	$656	$548	$439	$331	$223	$114
Alt 3a: 30,000 lbs. minimum (1999-2004)	$1,889	$1,635	$1,382	$1,129	$876	$622
Alt 3b: 30,000 lbs. minimum (1999-2007)	$1,453	$1,246	$1,038	$830	$622	$414
Alt 4a: 40,000 lbs. minimum (1999-2004)	$2,815	$2,454	$2,093	$1,732	$1,371	$1,010
PrefAlt 4b: 40,000 lbs. minimum (1999-2007)	$2,432	$2,101	$1,770	$1,439	$1,109	$778
Alt 5a: 50,000 lbs. minimum (1999-2004)	$4,030	$3,538	$3,046	$2,553	$2,061	$1,569
Alt 5b: 50,000 lbs. minimum (1999-2007)	$3,694	$3,216	$2,739	$2,261	$1,783	$1,306
Alt 6a: 60,000 lbs. minimum (1999-2004)	$5,072	$4,468	$3,864	$3,261	$2,657	$2,053
Alt 6b: 60,000 lbs. minimum (1999-2007)	$5,567	$4,900	$4,233	$3,566	$2,899	$2,233

Alternative 3 would require minimum average annual reef fish landings using fish traps or longline gear of 30,000 pounds per permit to qualify for a longline endorsement. The higher minimum landings requirement of **Alternative 3** would be expected to result in 82 and 88 qualifiers under the 1999-2007 and 1999-2004 time periods, respectively (see Table 2.3.1 and Table 2.3.2). Qualifying permits would account for approximately 72-74% of longline reef fish landings, approximately 59-61% of the longline trips, and approximately 71-74% of the longline sets in the eastern Gulf (see Tables 2.3.1 and 2.3.2). If no gear conversion occurs, annual net operating revenues under **Alternative 3** would be expected to be reduced by approximately $1.89 million and $1.45 million under 1999-2004 and 1999-2007 fishery performance conditions, respectively. If all affected vessels convert to vertical line gear, these projected reductions in annual net operating revenues would be expected to be reduced to $622,000 and $414,000, respectively. **Alternative 3**, as well as **Alternative 2**, may provide incentives for endorsement qualifiers to increase their fishing effort due to the reduced competition from other vessels. However, increases in effort are expected to be mitigated by the future implementation of the grouper and tilefish IFQ program.

Preferred Alternative 4 – Preferred Option b would require minimum annual average reef fish landings using fish traps or longline gear of 40,000 pounds per permit during the 1999-2007 period to qualify for a longline endorsement. **Preferred Alternative 4 – Preferred Option b** would be expected to limit the number of participants in the longline fishery in the eastern Gulf to 61 permits and reduce longline trips by approximately 54%. The reductions in longline effort expected from the implementation of **Preferred Alternative 4 – Preferred Option (b)** would be expected to result in greater reductions of the interactions between hardshell sea turtles and bottom longline gear while preserving approximately 60% of the historic reef fish landings using fish traps or longline gear. If no gear conversion occurs, annual NOR under **Preferred Alternative 4 – Preferred Option b** would be expected to be reduced by approximately $2.43 million. If all affected vessels convert to vertical line gear, the projected reduction in annual NOR would be expected to be reduced to $778,000. Reductions in total annual NOR would be expected to increase under **Option a** compared to **Preferred Option b**. Potential effort increases by qualifying longline operators may be a marginal consideration under **Preferred Alternative 4 – Preferred Option b** due the limited number of longline operators that would remain under the required minimum landings threshold set in this alternative. The limited number of longline operators that would remain may also suggest a greater likelihood for conversion from bottom longline gear to vertical line gear. It is also noted that the implementation of **Preferred Alternative 4 – Preferred Option b** may adversely impact the value of IFQ shares under the expected grouper and tilefish IFQ program by reducing the number of potential buyers. Overall, **Preferred Alternative 4 – Preferred Option b** may strike a balance between reducing interactions between hardshell sea turtles and bottom longline gear and providing opportunities to maintain a viable longline component of the reef fish fishery that would continue to support shore-side businesses and associated infrastructure dependent on this component of the fishery in the eastern Gulf.

Based on the composition and size distribution of the existing longline fleet, with relatively few of the larger vessels in the fleet not expected to meet the qualifying criteria, and the limited number of endorsements expected to be issued under the preferred alternative, prohibiting the transfer (**Sub-Option (i)**) of longline endorsements or limiting transfers to vessels of equal or lesser length (**Sub-Option (iii)**) would not be expected to reduce interactions between hardshell sea turtles and longline gear beyond levels expected under the preferred alternative. However, the implementation of **Sub-options (i)** or **(iii)** could result in adverse economic impacts by preventing the development of a market for endorsements or by impeding its proper functioning through restrictions on the number of potential participants and increased transaction costs. In contrast, while not expected to increase the number of interactions between hardshell sea turtles and bottom longline gear, **Preferred Sub-option (ii)** would not be expected to result in adverse economic impacts because it would allow unrestricted endorsement transfers between commercial reef fish permit holders.

Alternative 5 would require minimum annual average reef fish landings using fish traps or longline gear of at least 50,000 pounds per permit to qualify for a longline endorsement. The implementation of **Alternative 5** would be expected to result in permit endorsements to 39 and 45 permits for 1999-2007 and 1999-2004, respectively (see Table 2.3.1 and Table 2.3.2). Qualifying permits would account for 45-49% of reef fish landed using fish traps or longline gear, approximately 34-36% of the longline trips, and approximately 42-45% of the longline sets in the eastern Gulf (see Tables 2.3.1 and 2.3.2). If no gear conversion occurs, annual NOR under **Alternative 5** would be expected to be reduced by approximately $4.03 million and $3.69 million under 1999-2004 and 1999-2007 fishery performance conditions, respectively. If all affected vessels convert to vertical line gear, the projected reductions in annual NOR would be expected to be reduced to approximately $1.57 million and $1.31 million, respectively.

Alternative 6 would require minimum annual average reef fish landings using fish traps or longline gear of at least 60,000 pounds per permit to qualify for a longline endorsement. The implementation of **Alternative 6** would be expected to result in permit endorsements to 22 and 31 permits for 1999-2007 and 1999-2004, respectively (see Table 2.3.1 and Table 2.3.2). Qualifying permits would account for 30-37% of reef fish landed using fish traps or longline gear, approximately 20-26% of the longline trips, and approximately 24-32% of the longline sets in the eastern Gulf (see Tables 2.3.1 and 2.3.2). If no gear conversion occurs, annual NOR under **Alternative 6** would be expected to be reduced by approximately $5.01 million and $5.57 million under 1999-2004 and 1999-2007 fishery performance conditions, respectively. If all affected vessels convert to vertical line gear, the projected reductions in annual NOR would be expected to be reduced to approximately $2.05 million and $2.23 million, respectively.

While **Alternatives 5** and **6** would significantly curtail longline effort and interactions between hardshell sea turtles and bottom longline gear in the eastern Gulf, the higher landings thresholds required to qualify for an endorsement may result in fleet sizes that are too small to sustain shore-side businesses and associated infrastructure dependent on the longline component of the commercial reef fish fishery in the eastern Gulf.

It is important to note that the expected changes in NOR discussed above for **Alternatives 2 - 6** are aggregate changes. These estimates do not provide information on the expected economic effects on individual operations. Permit holders who qualify for an endorsement may experience increases in NOR while those who do not qualify would be expected to experience decreases.

Alternative 7 would require average annual reef fish landings using fish traps or longline gear of 30,000 pounds and a community-based criterion requiring ex-vessel values of red grouper landings to average at least 15% of the total ex-vessel value of all species landed in the community during the 1999-2007 period to qualify for the permit endorsement. Eligible vessels would have to have reported landings in a target community for at least 5 years during the 1999-2007 period. While an added focus on fishing communities reliant on the longline component of the reef fish fishery may allow several communities to sustain participation in the reef fish fishery, **Alternative 7** would not preclude a permit owner with the endorsement from landing his harvests in another community once the endorsements are granted. Further, due to several factors, including economic considerations such as ex-vessel price premiums that may be offered by a dealer in a given locality, fishermen may determine their preferred landings site and/or dealer on a case by case basis. Finally, the implementation of **Alternative 7** may raise equity and fairness issues because it would deny an endorsement to the reef fish permit to several permit owners with landings greater than or equal to the 30,000 pounds because they would not meet the required community histories.

6.3.4 Direct and Indirect Effects on the Social Environment

With regard to the impact of the various endorsement options on fishing communities, Table 6.3.4.1 provides a glimpse of what percentage of the longline fishing fleet will remain within communities with longline vessels home ported within its boundaries using the periods for the five different endorsement levels included in **Action 3**. The landings data used to qualify under this analysis includes both longline and trap landings for both periods. There were 281 vessels eligible for the endorsement period 1999-2004 under **Option a** and 297 eligible for the 1999-2007 period under **Option b** (Many communities do not appear in the table to maintain confidentiality where less than three vessels are homeported). Overall, 42% of the fleet (118 vessels) would remain under **Alternative 2 Option a** and 40% of the fleet remains (117 vessels) with **Option b**. For Pinellas County 53% of the fleet home ported there would remain under **Option a** while 46% would remain under **Option b.** Most of that fleet would be located in Madeira Beach which would see 50% of its vessels remain eligible to fish longline gear east of Cape San Blas under either option. Tarpon Springs would have 20% of its fleet eligible under **Option a** and 10% under **Option b.** For Cortez, 63% and 75% of its fleet would still be able to fish with a 20,000 lb endorsement under **Option a** and **Option b** respectively. Panama City would see just less than half of its fleet remain eligible to fish east of Cape San Blas with 47% meeting the criteria for a 20,000 lb endorsement under **Option a** and half the fleet remaining under **Option b**. Other communities discussed under Section 4 would include Apalachicola which would see all of its longline fleet remain eligible to fish the waters off Florida's west coast under either option. Steinhatchee would see 43% of its fleet remaining under either option in **Alternative 2**. Other communities described in Section 4, Key West and Fort Myers Beach would not have vessels that qualify for the lowest endorsement threshold. The community of Hudson would have no qualifying vessels under **Option b**.

Table 6.3.4.1. Percentage of longline vessels within a community that will remain under each endorsement level for communities with at least 3 vessels reporting it as homeport using both 1999-2004 and 1999-2007 time periods.

	20000 lbs		30000 lbs		40000 lbs		50000 lbs		60000 lbs	
Community	**99-04**	**99-07**	**99-04**	**99-07**	**99-04**	**99-07**	**99-04**	**99-07**	**99-04**	**99-07**
Apalachicola	100%	100%	75%	75%	50%	50%	25%	0%	25%	0%
Carrabelle	33%	67%	33%	33%	33%	0%	0%	0%	0%	0%
Clearwater	60%	80%	60%	60%	60%	40%	40%	20%	20%	20%
Cortez	63%	75%	50%	44%	31%	25%	25%	19%	19%	13%
Crystal River	57%	43%	14%	0%	0%	0%	0%	0%	0%	0%
Destin	22%	33%	11%	11%	0%	0%	0%	0%	0%	0%
Galveston	33%	33%	22%	11%	11%	11%	0%	0%	0%	0%
Hudson	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Largo	78%	56%	44%	56%	44%	44%	33%	22%	11%	11%
Madeira Beach	50%	50%	45%	50%	40%	45%	25%	35%	20%	10%
Marathon	33%	33%	33%	33%	33%	33%	0%	0%	0%	0%
Miami	88%	88%	88%	75%	75%	75%	63%	63%	50%	50%
Naples	14%	14%	14%	0%	0%	0%	0%	0%	0%	0%
New Orleans	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
New Port Richey	33%	33%	33%	0%	0%	0%	0%	0%	0%	0%
Panama City	47%	50%	31%	33%	22%	19%	14%	8%	11%	6%
Ruskin	67%	67%	67%	67%	50%	33%	33%	33%	33%	33%
Sarasota	100%	100%	100%	100%	100%	80%	100%	60%	60%	40%
Seminole	56%	56%	56%	44%	44%	44%	44%	33%	22%	11%
St Marks	40%	40%	40%	20%	20%	20%	0%	0%	0%	0%
St Petersburg	50%	33%	33%	33%	17%	33%	17%	17%	17%	0%
St Petersburg Beach	50%	50%	50%	50%	0%	0%	0%	0%	0%	0%
Steinhatchee	43%	43%	14%	14%	14%	0%	0%	0%	0%	0%
Tampa	33%	22%	22%	22%	11%	22%	0%	11%	0%	0%
Tarpon Springs	20%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Total eligible = 281/297| Pct Remaining	42%	40%	31%	28%	23%	21%	16%	13%	11%	7%

For **Alternative 3**, there would be 31% of the longline fleet that would remain eligible to fish east of Cape San Blas under **Option a** and 28% under **Option b**. Cortez would see 50% of its fleet remain eligible under **Option a** and 44% under **Option b**. Under **Option a** there would be a slight reduction of the fleet within Madeira Beach while all of the vessels that met the initial criteria would still qualify under **Option b**. Pinellas County as a whole would see only 44% of its vessels remain eligible under **Option a** and 43% under **Option b**. The communities of Crystal River, New Port Richey and Naples would no longer have vessels eligible under **Option b**.

With a 40,000 lb criterion under **Preferred Alternative 4** the remaining eligible longline fleet would be 23% for the 1999-2004 timeframe and 21% for 1999-2007. Destin and St. Petersburg Beach would no longer have vessels eligible under **Option a** and the communities of Carrabelle, Destin, St. Petersburg Beach and Steinhatchee would no longer have vessels that qualify using the 1999-2007 timeframe under **Preferred Option b**. Cortez would have only 25% of its eligible vessels still in the fishery under 1999-2007 and 31% under 1999-2004, while 40% of the Madeira Beach fleet would remain eligible under **Option a** and 45% under **Option b**. Clearwater would have 60% and 40% eligible for **Options a** and **b** respectively.

Under **Alternative 5** would leave only 16% and 13% of the fleet eligible to fish east of Cape San Blas using **Option a** and **b** respectively. Only 14% of the Panama City longline fleet would remain eligible for under **Option a** or 8% under **Option b**. Madeira Beach would have 25% of its vessels remain eligible under **Option a** and 35% remaining so under **Option b**. The community of Cortez would have 25% and 19% of its longline fleet capable of fishing the west coast of Florida's peninsula under **Options a** and **b** respectively. There would no longer be any vessels from Apalachicola, Carabelle, Galveston (Texas), St. Marks or Marathon that remained eligible. Tampa would no longer have vessels eligible under **Option a**. Pinellas County as a whole would have 29% of its eligible fleet remaining under **Option a** and 26% under **Option b**.

The most restrictive endorsement option under this action is **Alternative 6** with a 60,000 lb endorsement and would reduce the overall fleet to 18% of those eligible under **Option a**. and 11% under **Option b**. Apalachicola and St. Petersburg would not have any vessels that remain eligible under **Option b**.

Alternative 7 was added at the June Council meeting to preserve fishing infrastructure in those communities that are more reliant upon the longline fishery. National Standard 8 states that management measures (consistent with the Act) shall take into account the importance of fishery resources to fishing communities in order to provide for sustained participation and to minimize adverse economic impacts. Testimony during the June Council meeting by some individuals indicated that the more restrictive alternatives may place their business in jeopardy. With the recent emergency measure to close the fishery to longline gear inside of 50 fathoms, those vessels that had converted to vertical line gear were having difficulty reaching harvest levels that were comparable to that harvested with longline gear. Subsequently, several dealers have seen dramatically reduced landings and are unsure whether captains will be able to adapt sufficiently to this new gear type if they must convert to vertical line gear. They have also reduced the number of employees and down sized equipment needs.

Using the timeframe of 1999-2007, those communities that had red grouper landings value of at least 15% of total landing value and vessels that meet the criteria of the 30,000 lb endorsement are listed below in Table 6.3.4.2. The communities of Bokeelia, Cortez, Gulfport, Madeira Beach, Redington Shores, St. Petersburg, Tarpon Springs, and Treasure Island meet the 15% criteria for red grouper landings and have qualifying vessels for that timeframe. A total of 36 vessels meet the criteria of having landed at least 30,000 pounds and also having landed within one of the communities under **Option a** and 44 vessels meet the criteria under **Option b**. As mentioned before in Section 4, some communities may have had dealers who in the past had substantial landings of red grouper, but may no longer be in operation. For that reason, there may be no qualifying permitted vessels within those communities. However, there may be permitted vessels who qualified within a community that had sufficient landings of red grouper in the past, but no longer have dealers or fishing infrastructure at the present time.

Table 6.3.4.2. Percent of red grouper landings value from 1999-2007 and vessels that meet the 30,000 lb endorsement criteria within communities.

Community	Percentage of Red Grouper Landings Value	Communities with Vessels Meeting 30,000 lb Criteria 1999-2007
Bokeelia	16.7%	X
Cape Coral	44.9%	
Cortez	31.9%	X
Clearwater	27.7%	
Dunedin	18.0%	
Goodland	19.7%	
Gulfport	17.9%	X
Homosassa Springs	15.0%	
Madeira Beach	45.7%	X
Indian Shores	33.1%	
Myakka City	26.1%	
Nokomis	24.4%	
Redington Shores	51.9%	X
Ruskin	15.7%	
St. Cloud	26.8%	
St. Petersburg	22.2%	X
Silver Springs	19.8%	
Tallahassee	28.6%	
Tarpon Springs	15.3%	X
Thonotosassa	52.7%	
Treasure Island	59.3%	X
Venice	33.4%	

While Table 6.3.4.2 represents those communities with qualifying vessels landing with a dealer located within that community, Table 6.3.4.3 presents the percentage of vessels that will remain within a community declared as homeport city. Although a vessel may land at a dealer within a specific community, the vessels homeport may be in a different location. Qualifying landings, however, are based upon where the dealer is located. If the vessel receives an endorsement, it is assumed that future landings will be made within the community in which the landings criteria were met, in other words where the dealer is located. This may present a problem if a dealer moves or closes within a community where there may have been one entity and an endorsed vessel can no longer land within that community. This is evident when a vessels last location of landing is used for a filter to assess current practices as the only communities that would remain as eligible endorsement landing sites would be: Cortez, Madeira Beach, Redington Shores and Tarpon Springs.

Table 6.3.4.3. Percentage of longline vessels within a community with at least 15% red grouper value of landings that will remain under the 30,000 lb endorsement criteria for communities with at least 3 vessels reporting it as homeport using both 1999-2004 and 1999-2007 time periods.

Community	**Percent of vessels qualifying**	
	99-04	99-07
Apalachicola	25%	25%
Carrabelle	33%	33%
Clearwater	60%	60%
Cortez	44%	44%
Largo	44%	44%
Madeira Beach	50%	50%
Miami	25%	25%
Panama City	3%	3%
Ruskin	33%	33%
Sarasota	60%	60%
Seminole	38%	33%
St Petersburg	17%	17%
St Petersburg Beach	33%	25%
Steinhatchee	17%	17%
Tampa	25%	25%
Tarpon Springs	11%	10%
Total LL Vessels (281/297)	13%	15%

Alternative 7 under this analysis will leave 13% of the longline fleet eligible to fish east of Cape San Blas under **Option a** and 15% under **Option b**. There is one other community included in the above table that must remain anonymous to protect confidential information.

For **Alternative 7** using the landings criteria for only 2007, those communities that had red grouper as 12% of total landing value and vessels that meet the criteria of the 30,000 lb endorsement are listed below in Table 6.3.4.4. This analysis is more a reflection of the current businesses and landings associated within a community. A total of 38 vessels meet the criteria of having landed at least 30,000 pounds and also having landed within one of the communities under **Option a** and 45 vessels meet the criteria under **Option b**. However, there are only four communities that have vessels with landings that meet the 30,000 lb endorsement level: Apalachicola, Cortez, Madeira Beach and Redington Shores.

Table 6.3.4.4. Percent of red grouper landings value from 2007 and vessels that meet the 30,000 lb endorsement criteria within communities with 12% of value from red grouper.

Community	Percentage of Red Grouper Landings Value	Communities with Vessels Meeting 30,000 lb Criteria 1999-2007
Apalachicola	15.2%	X
Bokeelia	12.7%	
Cortez	31.9%	X
Clearwater	39.3%	
Dunedin	20.1%	
Eastpoint	17.6%	
Gainesville	37.6%	
Gulfport	48.8%	
Indian Shores	42.4%	
Lakeland	17.8%	
Madeira Beach	40.6%	X
Nokomis	23.0%	
Panacea	15.0%	
Redington Shores	56.8%	X
Ruskin	25.2%	
St. Cloud	28.6%	
St. Petersburg	20.4%	
Silver Springs	22.4%	
Steinhatchee	13.8%	
Tallahassee	48.5%	
Tarpon Springs	17.4%	
Venice	57.2%	

While Table 6.3.4.4 represents those communities with qualifying vessels landing with a dealer located within that community, Table 6.3.4.5 presents the percentage of vessels that will remain within a community declared as homeport city. Although a vessel may land at a dealer within a specific community, the vessels homeport may be in a different location. Qualifying landings, however, are based upon where the dealer is located. If the vessel receives an endorsement, it is assumed that future landings will be made within the community in which the landings criteria were met, in other words where the dealer is located. This may present a problem if a dealer moves or closes within a community where there may have been one entity and an endorsed vessel can no longer land within that community.

Table 6.3.4.5. Percentage of longline vessels landing within a community with at least 12% red grouper value of landings for 2007 that will remain under the 30,000 lb endorsement criteria for communities with at least 3 vessels reporting it as homeport using both 1999-2004 and 1999-2007 time periods.

Community	**Percent of vessels qualifying**	
	99-04	**99-07**
Apalachicola	0%	25%
Carrabelle	33%	33%
Clearwater	40%	60%
Cortez	38%	44%
Largo	33%	44%
Madeira Beach	45%	50%
Miami	25%	25%
Panama City	6%	6%
Ruskin	17%	33%
Sarasota	60%	60%
Seminole	25%	33%
St Marks	20%	20%
St Petersburg	17%	17%
St Petersburg Beach	100%	50%
Steinhatchee	17%	17%
Tampa	13%	11%
Tarpon Springs	11%	10%
Total LL Vessels (281/297)	14%	15%

Table 6.3.4.5 provides an assessment of how many vessels will remain eligible within each community that is designated as homeport for those longline vessels that are eligible for the 30,000 pounds endorsement and have landings within a community where red grouper is at least 12% of landed value for all landings for 2007. **Alternative 7** under this analysis will leave 14% of the longline fleet eligible to fish east of Cape San Blas under **Option a** and 15% under **Option b**. There is one other community included in the above table that must remain anonymous to protect confidential information.

Under all alternatives, the sub-options to either allow transfer of the endorsement or restrict that transfer would have social impacts. Under **Sub-option i** the prohibition of transfer would be the most restrictive in terms of the flexibility allowed within the fishery. The inability to transfer endorsements may place hardships on those who wish to enter or leave the fishery as it does not allow for that flexibility and removes some of the value of owning a longline vessel. The argument against transfer revolves around the possibility of increasing effort through capital stuffing which includes transfers to larger vessels. **Sub-option iii** would prevent this from happening by placing restrictions on the size of vessel to which an endorsement could be transferred. **Preferred Sub-option ii** would be the least restrictive in allowing complete transfer of endorsements with no restrictions and would likely be the preferred option by the industry as it would allow the most flexibility. This may become more important as management increasingly adopts "catch shares" or IFQ programs to manage different fisheries. Having the ability to transfer endorsements can add value to a reef fish permit and provide a larger market for permits.

The establishment of a longline endorsement may force some permit holders to change gear in order to remain in the fishery. As mentioned in Section 6.2.3, there are costs involved in retrofitting a vessel to vertical line and there is an additional skill set that needs to be learned in order to be successful using vertical line gear. **Alternative 1** may have little impact as long as the Council does not choose other options that would force permit holders to make other adjustments to their fishing operation. **Alternatives 2, 3 4, and 5** would allow more longline vessels to retain their gear, each being more restrictive respectively, while **Alternative 6** would be the most restrictive and require the most change within the fishery. As mentioned earlier, those vessels that have converted to vertical gear during the closure have encountered a steep learning curve for captains who are not familiar with that type of gear. While some vessels have converted to power rod and reels rather than invest in the more expensive bandit reels, the lower catch rates have hampered the conversion and may impact the long term prospects of some fish houses and the overall makeup of the reef fish fishery. **Alternative 7** may be able to help preserve the fishing infrastructure within those communities most reliant on red grouper; however, it is contingent upon those businesses remaining within those communities.

This action has some support within the industry as a means to reduce interactions with sea turtles and included a negotiated alternative with environmental non-governmental organizations at the April Council meeting. However, since additional information and analysis was provided at the June Council meeting, which included updated observer data on sea turtle takes and an analysis on projected impact of various alternatives, some environmental groups that had supported the preferred option may now support the more restrictive alternatives or actions. The change in support for the negotiated alternative may have further implications for negotiations between these parties in the future. Other social impacts would be increased competition within the vertical line component and possibly increased fishing pressure on the DWG if endorsements were accompanied by depth restrictions.

6.3.5 Direct and Indirect Effects on the Administrative Environment

This action is primarily an administrative in nature. **Alternative 1**, no action, would not increase or decrease the administrative burden managing the bottom longline component. **Alternatives 2, 3, 4, 5, 6,** and **7** would directly affect the administrative environment because permit histories and landings for both longline gear and fish traps would need to be combined for the selected qualifying years. However, **Preferred Alternative 4** should provide a long-term benefit to the administrative environment, because the number of longline endorsements would decrease. This would reduce administrative efforts needed for endorsement renewal and communicating with fishermen through Fishery Bulletins.

6.4 Action 4: Modify Fishing Practices and Gear for Vessels using Bottom Longline Gear to Harvest Reef Fish east of Cape San Blas

6.4.1 Direct and Indirect Effects on the Physical Environment

Bottom longline gear, as described in Section 6.2.1, can be destructive to the benthic substrate therefore any reduction in fishing effort would be beneficial to the physical environment. Impacts of these alternatives on the physical environment will depend on the resulting modifications to fishing effort in the commercial bottom longline component. **Alternative 1** would maintain the existing levels of impact to the physical environment, which are discussed in sections 6.2.1. **Alternatives 2, 3 and 4** could directly affect the physical environment by changes in fishing effort. These alternatives limit mainline length (**Alternative 2**), number of hooks per vessel (**Preferred Alternative 3**), and gangion length (**Alternative 4).** All three of these alternatives could directly impact the physical environment during contact with the benthic substrate by dragging, hooking, or entangling the substrate and the attached organisms. Any reduction in mainline length, number of hooks, or gangion length could reduce the probability of entanglement and damage to the benthic substrate. Currently, bottom longline operators in the reef fish fishery use mainline material composed of galvanized cable, steel cable, or monofilament, ranging in diameter from 3.2 to 4.0 mm (NMFS 2005). If mainline length were reduced under **Alternative 2,** it could cause less physical damage to the bottom by reducing the chances of entanglement of the gear (i.e., cable or monofilament) with the substrate. **Alternative 2 Options a-c**, limit mainline length to 1, 2, or 4 nautical miles, respectively. These lengths are shorter than the average mainline length used in the bottom longline reef fish fishery (NMFS 2009a). **Option d** limits mainline length to 5 nautical miles, which is still below average, but used by a greater number of bottom longline fishers. Any of the options under **Alternative 2** that limit mainline length are likely to reduce physical impact to the environment by reducing the amount of substrate impacted due to mainline length. **Preferred Alternative 3** limits the number of hooks per vessel to **Option b,** 1,000 hooks of which no more than 750 hooks are fished or rigged for fishing. Under **Alternative 3, Options a** and **c** limit the number of hooks to 500 and 1,500 respectively. Any of these options, with the exception of **Option c** would be a reduction in the average number of hooks used by the fishery, both recorded in logbooks and by observers (NMFS 2009a). The reduction in hooks fished by the bottom longline component is expected to have positive impacts on the physical environment reducing the chances of hooks snagging the substrate or becoming entangled with the substrate during haulback. Similarly, **Alternative 4 Options a-c,** limit gangion length to 2, 4, or 6 ft. respectively, reducing the probability of damage to the physical environment. It is assumed that any reduction in the length of gangions could result in a lower probability of gangions becoming entangled with the substrate, potentially pulling up attached organisms during haulback.

Increased effort would have negative impacts on the physical environment. It is possible that some bottom longline fishers could simply increase the number of sets thereby offsetting any reduction in hardshell sea turtles interactions and the benefits to the physical environment that may have been achieved otherwise. On the other hand, it can be argued that more sets per vessel would be difficult to complete simply due to daily limitations. Therefore, it is unlikely that any additional days at sea or sets will be added due to these alternatives (See section 6.4.2. for a discussion on effort shifts and compensation analysis for **Action 4** and the combined **Preferred Alternatives**).

An effort shift to vertical lines in the commercial reef fish fishery is not as likely to occur with the implementation of these actions and alternatives; however, it is possible. If effort did shift from bottom longline gear to vertical line gear due to implementation of these alternatives, then less physical damage to the environment may occur (see Section 6.2.1 for a description of vertical line gear and its effects on the physical environment).

6.4.2 Direct and Indirect Effects on the Biological Environment/Ecological Environment

Alternative 1 would maintain the same level of biological/ecological impacts currently executed in the bottom longline component of the reef fish fishery. Impacts of the following alternatives could depend on the reduction in effort in the commercial reef fish fishery.

Alternative 2 would limit mainline length in the bottom longline component of the reef fish fishery. Limiting mainline length could have positive impacts on the biological and ecological environment. The bottom longline component currently uses a range of mainline lengths. The average mainline length calculated from the 2005-2008 logbook data was from 6 to 7 nautical miles. The minimum mainline length recorded in logbooks was 0.5 nautical mile and the maximum was 26 nautical miles (NMFS 2009a). Observers in the reef fish program recorded the same average mainline length documented in logbooks (i.e., 6 nautical miles), but the maximum mainline length recorded by observers was 12 nautical miles (NMFS 2009a). **Alternative 2 Options a-d** are shorter mainline lengths than presently used by most bottom longline reef fish fishers. **Option a** limits mainline length to 1 nautical mile and **Option b** limits mainline length to 2 nautical miles. If either of these options were selected as a preferred alternative, they are likely to reduce the probability of hardshell sea turtles drowning if they become hooked or entangled in bottom longline gear. Mainline length is closely tied to soak time which is defined as the last hook in the water to the first hook hauled out of the water. A reduction in mainline length could reduce soak time due to shorter time in setting and retrieving the mainline. This could reduce the period of time the mainline is in the water and reduce hardshell sea turtle interactions with gear. However, **Options a** and **b** are not considered practical by bottom longline fishers in the reef fish fishery (G. Brooks and R. Spaeth, personal communication). **Option c** limits mainline length to 4 nautical miles. Observers did not record hardshell sea turtle takes when this length of mainline was used, but this length is shorter than the average lengths documented in logbooks or by observers (Figure 2.4.1). **Option d** limits mainline length to 5 nautical miles and was suggested by bottom longline fishers; however, there is little evidence to suggest that this length of bottom longline gear would reduce interactions with hardshell sea turtles and improve their chances of survival. Reducing mainline length could also make haulback of the mainline quicker, increasing the probability that an undersized or non-targeted reef fish will survive after dehooking and release. There could also be negative impacts to the biological and ecological environment if fishers increased effort to maintain CPUE of targeted reef fish to offset reduced mainline length, rendering reductions in bycatch of undersized or non-targeted reef fish and hardshell sea turtles irrelevant.

Preferred Alternative 3 limits the number of hooks per vessel to 1,000 hooks of which no more than 750 hooks are fished or rigged for fishing. Logbook and observer programs do not record the number of hooks per vessel, but instead the number of hooks per set. For the purposes of this alternative, it is assumed that the average number of hooks per set is fairly consistent due to the pre-cut mainline length spooled on the drum. Logbook data from 2005 and 2006 recorded an average of 1,200 hooks per set, by the bottom longline component; whereas, observers documented an average of 1,500 hooks per set (NMFS 2009a). Frequency distributions from logbooks data were created for 2006 and 2007 logbook data. Most sets had 1,000 to 1,500 hooks per set (Figure 6.4.2.1). Positive impacts to the biological and ecological environmental are likely to occur with a reduction in the amount of hooks fished. The number of targeted and non-targeted species will be reduced if the number of times the hooks are set is not increased. It is probable that the more hooks used per mainline, the greater the soak time, simply due to the amount of time it takes to haul back gear and dehook catch and bycatch (NMFS 2009c). The cumulative effects analysis found the number of hooks versus soak time was 23% correlated based on the 2006-2008 observer programs (NMFS 2009c). Reducing the number of hooks and therefore soak time could increase the probability of hardshell sea turtles surviving. Further, any decrease in the number of hooks per vessel (i.e., used per set) may reduce the number of hardshell sea turtles incidentally hooked as well as the targeted or undersized finfish catch. A reduction in bycatch for both reef fish and hardshell sea turtles would be beneficial to the biological and ecological environment. **Option a** limits the number of hooks per vessel to 500 and **Option c** limits them to 1,500. **Option a** is expected to have a greater positive impact on the biological environment than **Preferred Option b** or **c**. Observers did not record hardshell sea turtle interactions when 500 hooks per set were used, but the Council felt limiting a bottom longline vessel to 500 hooks was impractical for operation. Because **Option c** does not reduce the number of hooks as greatly as **Options a** or **b**, the impacts are not as beneficial to the biological and ecological environment. **Preferred Option b** limits hooks per vessel to 1,000 hooks of which no more than 750 hooks are fished or rigged for fishing**.** The Council felt this alternative was the middle ground between practical bottom longline gear limitation and adequately reducing hardshell sea turtle takes. Limiting the number of hooks could allow operations to run more quickly decreasing the impacts on bycatch of hardshell sea turtles and reef fish species. Observers recorded the greatest number of hardshell sea turtle takes when 1,500 and 2,100 hooks per set were used (Figure 2.4.2) suggesting **Option c** would be the least beneficial to the biological environment. **Preferred Alternative 3 Option b** alone is expected to reduce effective effort between 27-39% and therefore bycatch of reef fish and hardshell sea turtles (NMFS 2009c).

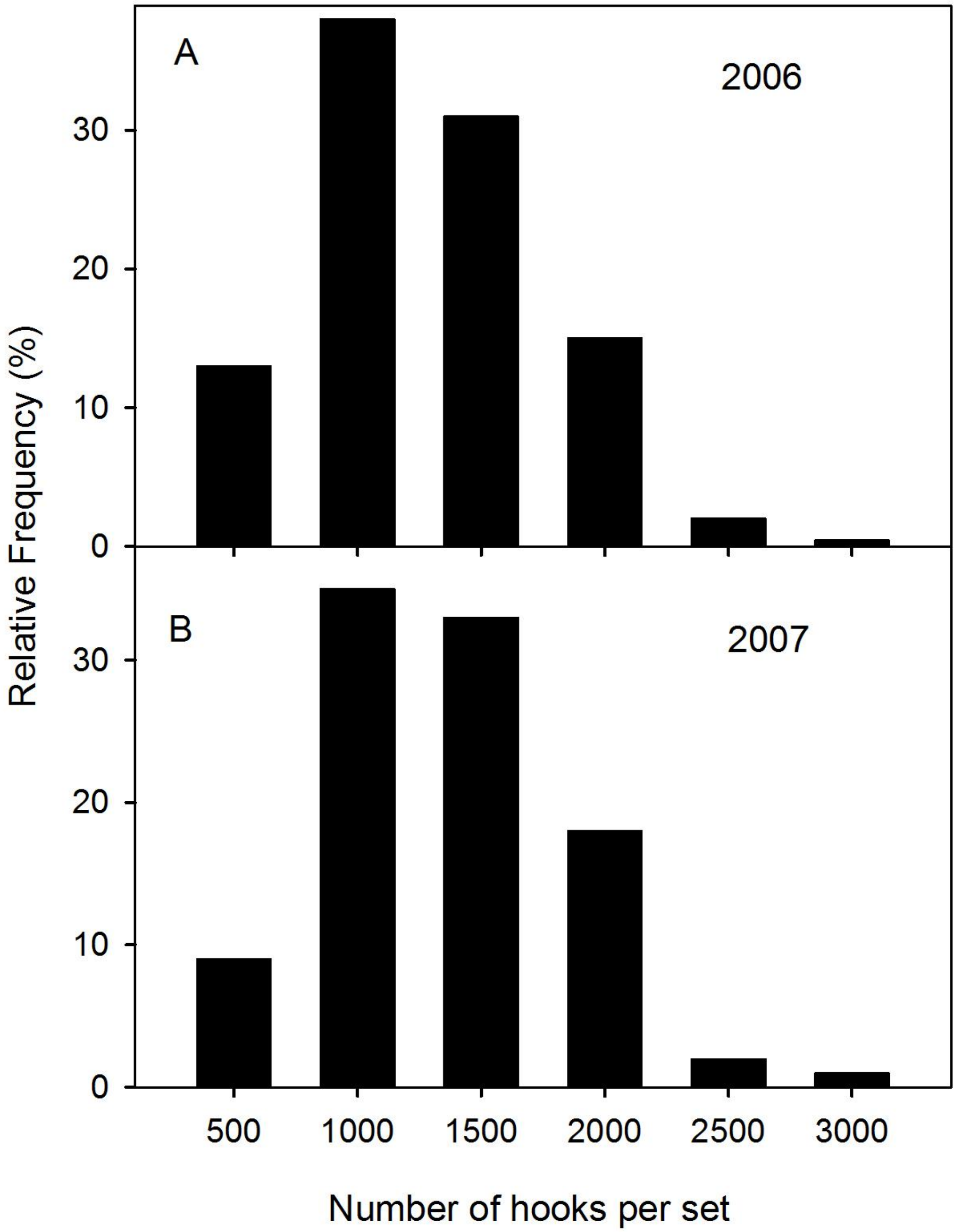

Figure 6.4.2.1. Relative frequency distribution of hooks per set (A) 2006 logbook data (B) 2007 logbook data (Source: NMFS 2009a).

Alternative 4 Options a-c could have a positive effect on the biological and ecological environment by reducing the chances of hooking or entangling hardshell sea turtles. **Alternative 4** limits gangion length in the bottom longline component. Anecdotal reports from the bottom longline fishers suggest that hardshell sea turtles were not as frequency hooked with gear until longer (i.e., 6 to 10 ft.) gangions were used. Observer data from 2005-2008 recorded 4 to 12 ft. gangions in the bottom longline component, and did not document the shorter (i.e., 2 to 3 ft.) "broomstick gangions", previously used in the fishery (NMFS 2005). **Option a** limits gangion length to 2 ft., **Option b** limits gangion length to 4 ft., and **Option c** limits gangion length to 6 ft. Observers recorded 6 and 8 ft. gangions the most frequently out of all of the observer reef fish trips (Figure 2.4.4). Bottom longline reef fish fishers typically use gangion material made of monofilament ranging in strength from 200 to 400 pound test (NMFS 2005) and lengths ranging from 4 to 12 ft. (Figure 2.4.4). Observers recorded some hardshell sea turtles takes on all gangion lengths used (Figure 2.4.3). However, the greatest frequency of no hardshell sea turtle takes recorded by observers was when 4 ft. gangions were used, versus 6, 8 and 10 ft. However, the majority of the bottom longline component of the reef fish fishery does not used 4 ft. gangions (Figure 2.4.4). Further research is needed to determine if there is a correlation between gangion length and hardshell sea turtles.

Anecdotal evidence suggests that use of longer gangions lends itself towards different fishing practices such as longer soak times. If so, fishing practices and gear that promote longer soak times may cause more damage to the biological and ecological environment. Further, some fishers in the industry have suggested that longer gangions allow the bait to float up, so that the hardshell sea turtles and reef fish are not aware of the gangion and hook attached to the mainline. This results in the hardshell sea turtle or reef fishes either becoming hooked while eating the bait or entangled while pursuing the bait. If this information is true it may be beneficial to reduce gangion length so that hardshell sea turtles are not attracted to the bait. Similarly, if this is also true for reef fish as well as hardshell sea turtles, reducing gangion length may also reduce CPUE of targeted reef fish, which could be beneficial for undersized or non-targeted reef fish. However, little data supports this hypothesis other than anecdotal evidence from members of the bottom longline industry.

There is also other information that suggests limiting gangion length may be beneficial to the biological and ecological environment. For example, if gangion lengths were limited and a hardshell sea turtle did become entangled or hooked, and it was able to break free; the probability of hardshell sea turtle survival may be higher if less line is trailing behind the sea turtle. The additional line could become entangled with the substrate or around the sea turtle's beak or fins. However, if the sea turtle is deeply hooked or is unable to break free from the mainline, gangion length may not make a significant difference in hardshell sea turtle survival. The magnitude of reduction in hardshell sea turtle takes that could be achieved by **Alternative 2** or **4** is unknown.

An effort shift in the commercial reef fish fishery is not as likely to occur with the implementation of these actions and alternatives; however, it is possible. If effort did shift from bottom longline gear to vertical line gear due to implementation of these alternatives, then greater biological or ecological damage to the environment may occur (see Section 6.2.1 for a description of vertical line gear). For some species such as gag, the CPUE is higher using vertical line versus longline. This is also true for greater amberjack and gray triggerfish potentially threatening the rebuilding plans if landings of these species greatly increased (NMFS 2009a). Similarly, if a large number of participants convert to vertical line, because of these actions and alternatives, a greater amount of bycatch and bycatch mortality for gag could increase creating more negative impacts to the biological environment due to their overfished and undergoing overfishing status (SEDAR 2009b). Section 6.2.2 also discusses impacts to the biological and ecological environment if a large number of fishers converted from bottom longline to vertical line gear.

Logbooks documented 77% of the fish harvested with bottom longline gear were groupers and tilefishes (NMFS 2009a). A reduction in the number of hooks could be beneficial to gag listed as overfished and undergoing overfishing (SEDAR 2009b), as well as other grouper species. Effort could also shift to other species besides groupers. For example, from bottom longline trips 23% of the reef fish landed were reef fish other than tilefish and grouper species such as greater amberjack and gray triggerfish (NMFS 2009a). Therefore, reduced effort (i.e., number of hooks) could also benefit other targeted and non-targeted reef fish species.

Implementation of **Action 4** could have a greater negative impact to the biological and ecological environment if fishing effort increased, by additional gear sets being deployed and retrieved to offset gear limitations; specifically **Preferred Alternative 3 Option b**. For example, if CPUE is decreased due to the number of hooks then fishers might increase effort to make up for reduced catch, negatively affecting the biological and ecological environment. It could also be argued that more sets per vessel would be difficult to complete simply due to daily limitations and therefore it is unlikely that any additional days at sea or sets will be spent due to **Preferred Alternative 3 Option b**.

Combined Effects of Preferred Alternatives

The Council's combined suite of preferred alternatives require a 40,000 pound endorsement to fish east of Cape San Blas with bottom longline gear, closure of fishing with bottom longline gear from 35 fathoms shoreward during the months of June-August, and limitation in the number of hooks per vessel to 1,000 of which 750 can be rigged for fishing or fished. These combined preferred alternatives are expected to achieve between a 48-67% reduction in effective effort and therefore, interactions with hardshell sea turtles and bottom longline gear (See Section 6.3.2 or NMFS 2009c for a definition of effective effort). The range in reduction is based on various analysis of effort shifting scenarios in the bottom longline component of the reef fish fishery (NMFS 2009c).

Effort was summarized on a trip level basis. Sets-per-day were computed as sets-per-trip divided by days at sea and number of hooks was computed as hooks-per-set times sets-per-trip (NMFS 2009c). In conjunction with the sensitivity runs previously described (e.g., increasing versus constant effort), three different effort compensation approaches were used for discussion of the expected reduction in effective effort resulting in the reduction in hardshell sea turtle interactions for **Preferred Actions 2**, **3**, and **4**. The first scenario discussed was the "no effort compensation", under this scenario the number of sets-per-trip remained at the baseline levels. The expected reduction under this effort scenario would result in a 61-67% expected reduction in effort and therefore sea turtle interactions (Table 6.4.2.1). There are two “high effort compensation” scenarios. One would result in a 54-63% reduction in effort assuming endorsed vessels maintain the baseline (2007-2008) effort levels and compensate for the hook reduction by assuming trips previously made with greater than 1,000 hooks would compensate by making an average of 2.6 sets-per-day (Table 6.4.2.2). This effort scenario is believed to be the most probable scenario of effort compensation discussed in the NMFS (2009c) analysis. Under the “highest effort” compensation scenario, vessels with an endorsement increase effort to the 2003 effort levels, which was the highest recorded effort during the 1999-2007 time period. Then the anticipated reduction in effort and therefore sea turtle interactions under the highest effort compensation would be between 48-55% (Table 6.4.2.3). There are numerous assumptions associated with the expected reductions in effort in the bottom longline component of the reef fish fishery (see section 6.3.2 or NMFS 2009c). A major assumption of the model is that reducing the number of hooks will lead to reduced sea turtle bycatch (NMFS 2009c).

Table 6.4.2.1. Percent reductions in effective effort in eastern Gulf of Mexico (areas 1-10) bottom longline component of the reef fish fishery impacting sea turtle take from 2007-2008 baseline under various proposed Alternatives from Actions 2 and 3 in Amendment 31, assuming constant effort and a reduction to 750 hooks per vessel with no effort compensation for reduced hooks.

CONSTANT EFFORT			ENDORSEMENT LEVEL											
			None			40K			50K			60K		
		Effort Shift	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE
	None	n/a		39%			61%			71%			84%	
35-FATHOM CLOSURE	Jun-Aug	100%	43	47%		61	66%		71	74%		84	85%	
		75%		48%			66%			75%			85%	
		50%		48%	49		67%	67		75%	75		86%	86
	Apr-Aug	100%	45	51%		63	69%		73	76%		84	86%	
		75%		52%			69%			77%			86%	
		50%		54%	55		70%	71		77%	78		86%	87
	Annual (W=0.636, S=0.296)	100%	42	58%		65	73%		74	79%		85	87%	
		75%		62%			76%			81%			88%	
		50%		66%	70		78%	81		83%	84		89%	90
	Annual (W=0.296, S=0.296)	100%	50	63%		69	76%		76	82%		86	89%	
		75%		66%			78%			83%			89%	
		50%		68%	71		80%	81		84%	85		90%	90
	Annual (W=0, S=0.296)	100%	60	67%		75	79%		81	84%		88	89%	
		75%		69%			80%			84%			90%	
		50%		70%	72		81%	82		85%	85		90%	90
50-FATHOM CLOSURE	Jun-Aug	100%		53%			70%			77%			87%	
		75%		53%			70%			77%			87%	
		50%		54%			70%			77%			87%	
	Apr-Aug	100%		60%			74%			80%			88%	
		75%		61%			75%			80%			88%	
		50%		63%			75%			81%			89%	
	Annual	100%		86%			92%			94%			96%	
		75%												
		50%												

Note: 'Constant effort' assumes no increase in effort from 2007-2008 average. 'LE' denotes lower estimate; 'UE' denotes upper estimate based on 95% confidence interval in ratio of sea turtle population density. 'S' denotes summer scalar ratio for sea turtle density; 'W' denotes winter (Garrison 2009).

Table 6.4.2.2. Percent reductions in effective effort in eastern Gulf of Mexico (areas 1-10) bottom longline component of the reef fish fishery impacting sea turtle take from 2007-2008 baseline under various proposed Alternatives from Actions 2 and 3 in Amendment 31, assuming constant effort and a reduction to 750 hooks per vessel with effort compensation assuming trips with >1000 hooks will make an average of 2.56 (± 0.14) sets per day.

CONSTANT EFFORT			ENDORSEMENT LEVEL											
			None			40K			50K			60K		
		Effort Shift	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE
35-FATHOM CLOSURE	None	n/a		**27%**			**55%**			**67%**			**80%**	
35-FATHOM CLOSURE	Jun-Aug	100%	30	**36%**		54	**60%**		66	**70%**		80	**82%**	
		75%		**37%**			**61%**			**70%**			**82%**	
		50%		**38%**	41		**61%**	63		**71%**	72		**83%**	83
35-FATHOM CLOSURE	Apr-Aug	100%	32	**41%**		56	**63%**		68	**72%**		81	**83%**	
		75%		**42%**			**64%**			**72%**			**83%**	
		50%		**44%**	47		**65%**	66		**73%**	74		**84%**	84
35-FATHOM CLOSURE	Annual (W=0.636, S=0.296)	100%	29	**49%**		58	**68%**		68	**75%**		81	**85%**	
		75%		**53%**			**71%**			**77%**			**86%**	
		50%		**57%**	63		**73%**	77		**79%**	81		**87%**	88
35-FATHOM CLOSURE	Annual (W=0.296, S=0.296)	100%	39	**54%**		62	**71%**		71	**78%**		83	**86%**	
		75%		**57%**			**73%**			**79%**			**87%**	
		50%		**60%**	64		**75%**	78		**80%**	82		**87%**	88
35-FATHOM CLOSURE	Annual (W=0, S=0.296)	100%	49	**59%**		69	**74%**		76	**80%**		85	**87%**	
		75%		**61%**			**76%**			**81%**			**87%**	
		50%		**62%**	65		**77%**	78		**81%**	83		**88%**	88
50-FATHOM CLOSURE	Jun-Aug	100%		**44%**			**64%**			**73%**			**84%**	
		75%		**44%**			**65%**			**73%**			**84%**	
		50%		**44%**			**65%**			**74%**			**84%**	
50-FATHOM CLOSURE	Apr-Aug	100%		**52%**			**69%**			**76%**			**86%**	
		75%		**54%**			**70%**			**77%**			**86%**	
		50%		**55%**			**71%**			**78%**			**87%**	
50-FATHOM CLOSURE	Annual	100%		**80%**			**89%**			**92%**			**95%**	
		75%												
		50%												

Note: 'Constant effort' assumes no increase in effort from 2007-2008 average. 'LE' denotes lower estimate; 'UE' denotes upper estimate based on 95% confidence interval in ratio of sea turtle population density. 'S' denotes summer scalar ratio for sea turtle density; 'W' denotes winter (Garrison 2009).

Table 6.4.2.3. Percent reductions in effective effort in eastern Gulf of Mexico (areas 1-10) bottom longline component of the reef fish fishery impacting sea turtle take from 2007-2008 baseline under various proposed Alternatives from Actions 2 and 3 in Amendment 31, assuming increasing effort following 2003 proxy levels and a reduction to 750 hooks per vessel with effort compensation assuming trips with >1000 hooks will make an average of 2.56 (± 0.14) sets per day.

INCREASED EFFORT			ENDORSEMENT LEVEL								
			40K			50K			60K		
		Effort Shift	LE	Mean	UE	LE	Mean	UE	LE	Mean	UE
35-FATHOM CLOSURE	None	n/a		**45%**			**61%**			**77%**	
35-FATHOM CLOSURE	Jun-Aug	**100%**	48	**52%**		62	**65%**		77	**79%**	
		75%		**53%**			**66%**			**79%**	
		50%		**54%**	55		**66%**	67		**80%**	80
35-FATHOM CLOSURE	Apr-Aug	**100%**	49	**56%**		64	**68%**		78	**80%**	
		75%		**57%**			**68%**			**80%**	
		50%		**58%**	60		**69%**	70		**81%**	81
35-FATHOM CLOSURE	Annual (W=0.636, S=0.296)	**100%**	47	**63%**		62	**72%**		77	**82%**	
		75%		**66%**			**74%**			**83%**	
		50%		**69%**	73		**76%**	79		**84%**	86
35-FATHOM CLOSURE	Annual (W=0.296, S=0.296)	**100%**	55	**67%**		67	**75%**		80	**84%**	
		75%		**69%**			**76%**			**84%**	
		50%		**71%**	75		**78%**	80		**85%**	86
35-FATHOM CLOSURE	Annual (W=0, S=0.296)	**100%**	63	**71%**		73	**77%**		82	**85%**	
		75%		**72%**			**78%**			**85%**	
		50%		**73%**	75		**79%**	80		**86%**	86
50-FATHOM CLOSURE	Jun-Aug	**100%**		**58%**			**69%**			**81%**	
		75%		**59%**			**69%**			**81%**	
		50%		**59%**			**70%**			**81%**	
50-FATHOM CLOSURE	Apr-Aug	**100%**		**64%**			**73%**			**83%**	
		75%		**65%**			**74%**			**83%**	
		50%		**66%**			**75%**			**84%**	

Note: 'Increased effort' assumes remaining (e.g., endorsed) vessels will increase their effort to 2003 levels due to lack of competition; no endorsement scenario not shown due to this assumption. 'LE' denotes lower estimate; 'UE' denotes upper estimate based on 95% confidence interval in ratio of sea turtle population density. 'S' denotes summer scalar ratio for sea turtle density; 'W' denotes winter (Garrison 2009).

6.4.3 Direct and Indirect Effects on the Economic Environment

Alternative 1, the no action alternative (status quo), would not require any changes in current fishing practices and gear to harvest reef fish using bottom longline gear in the eastern Gulf. Because no changes in current fishing practices or gear would be required, **Alternative 1** would not be expected to result in any changes in fishing behavior and economic performance. However, under the status quo alternative, levels of interactions between hardshell sea turtles and longline gear and associated hardshell sea turtle takes would be expected to remain high. The magnitude of negative economic impacts that could result from the continued take of threatened hardshell sea turtles is not known. Furthermore, a delay in the implementation of measures reducing interactions between hardshell sea turtles and longline gear could lead to more restrictive management measures at a later date, resulting in greater adverse economic impacts at that time than those of the proposed action.

Alternative 2 considers several options limiting mainline length in the bottom longline component of the reef fish fishery in the eastern Gulf. Maximum allowable mainline lengths range from 1 to 5 nautical miles (**Options a-d**). All options considered under **Alternative 2** would establish maximum allowable mainline lengths that are shorter than the average mainline length for observed sets without hardshell sea turtle takes. Based on observer data. the mean mainline length for sets without hardshell sea turtle takes was approximately 5.3 miles, while the mean mainline length for sets with hardshell sea turtle takes was approximately 6.7 miles (see Section 2.4). Based in part on the statistically significant difference in average mainline length between sets with and without hardshell sea turtle takes, reducing the maximum allowable mainline length would be expected to reduce interactions between hardshell sea turtles and bottom longline gear. However, the magnitude of reduction in interactions anticipated from these management measures is not known. If it is assumed that fewer interactions between hardshell sea turtles and bottom longline gear would result from shorter mainlines, other things equal, **Option a** would be expected to achieve the greatest reduction in interactions. In decreasing order of effectiveness in reducing interactions, **Options b, c,** and **d** would follow. Adverse economic effects borne by the bottom longline component of the commercial reef fish fishery in the eastern Gulf accruing to mainline length restrictions would include potential reductions in total catch and gear modification costs. Fishing labor needs may increase if shorter mainline lengths increase the turnaround processing time per longline set. Additional costs could be incurred by the industry if longline operators decide to adjust other fishing practices, such as trip length or number of sets, to mitigate the potential impacts of mainline length restrictions on NOR. It might be assumed that these effects increase directly and uniformly with increasing restrictiveness of the mainline length. However, the behavioral reaction of fishermen may vary and cannot be forecast with available data. As a result, quantitative estimates of the incremental or net adverse economic effects associated with these options cannot be determined at this time.

Preferred Alternative 3 would set the maximum allowable number of hooks per vessel in the bottom longline component of the reef fish fishery in the eastern Gulf. **Options a** and **c** would restrict the maximum number of hooks per vessel to 500, and 1,500 hooks, respectively. **Preferred Option b** would restrict the maximum number of hooks per vessel to 1,000 hooks of which no more than 750 hooks could be fished or rigged for fishing. In combination with the seasonal closures proposed under Action 2 and the endorsement program considered under Action 3, **Preferred Option b** would be expected to reduce interactions between sea turtles and bottom longline gear in the eastern Gulf while preserving the gear flexibility needed to sustain bottom longline operations. Logbook and observer data do not record the number of hooks per vessel, but provide the number of hooks per set. Analyses of observer data indicate there was a statistically significant difference between the average number of hooks per mile for sets with hardshell sea turtle takes and sets without hardshell sea turtle takes. The average number of hooks per mile was greater for sets with turtle takes[11], suggesting that reductions in the maximum number of hooks per set could, other things equal, result in reductions in interactions between hardshell sea turtle interactions and bottom longline gear. Estimates of the expected economic effects that could result from reductions in the number of hooks per vessel are not quantifiable with available data. Possible adverse economic effects include reduced catch rates per set (while the options limit the number of hooks per vessel, the number of hooks per set may logically be a function of the total hooks on the vessel and the need to carry spares to reduce a need of return to shore if hooks are lost), reduced total catch, reduced efficiency, and reduced net returns. **Option a** would impose the most restrictive hook limitation and would be expected to potentially result in the greatest adverse economic effects on fishing vessels. **Option c** would allow the largest number of hooks per vessel and would be expected to accommodate more current behavior than the other options. However, as previously stated, estimates of the net economic effects of any of these options cannot be provided and, therefore, ranking these options from an economic perspective is not possible.

Alternative 4 would limit gangion length in the bottom longline component of the reef fish fishery in the eastern Gulf. Under **Options a, b,** and **c**, the maximum allowable gangion lengths would be 2, 4, and 6 ft., respectively. Anecdotal evidence suggests that shorter gangion lengths may result in fewer interactions between hardshell sea turtles and longline gear. However, hardshell sea turtle takes have been recorded at all gangion lengths. Also, analysis of observer data indicated there was no statistically significant difference between average gangion length for sets with and without hardshell sea turtle takes. Thus, potential reductions in interactions from this alternative may be limited. Furthermore, reductions in interactions may be negated if longline operators increase the number of sets to mitigate possible reductions in target catch. The possible economic effects of limits on the gangion length include initial increased gear costs (associated with re-gearing), reduced catch rates, increased costs associated with altered fishing practices, harvest reductions, and reductions in net returns. It may seem logical to presume these possible adverse effects increase as the maximum gangion length is reduced. However, data to support this presumption is not available and it is not possible to determine the net economic effects of any of the options considered. Overall, the extent (if any) to which **Alternative 4** could reduce interactions between hardshell sea turtles and longline gear and the potential economic impacts of the options considered are unknown.

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[11] Average numbers of hooks per set with and without hardshell sea turtles were estimated at 1,558 and 1,012 hooks respectively.

6.4.4 Direct and Indirect Effects on the Social Environment

The various alternatives included in **Action 4** have been suggested by industry as possible ways to reduce interactions with hardshell sea turtles. In, fact, the industry has submitted proposals to test various gear modifications, including some that appear here, to measure whether or not they actually do reduce the interactions with hardshell sea turtles. Industry representatives have indicated that gear modifications would be preferred to other actions within this document; however, it is unlikely that these actions alone would be enough to reduce the incidental interaction with hardshell sea turtles. With **Alternative 2** the mainline length would be substantially limited under **Option a** and would require a change in fishing behavior that would likely result in an increased number of sets over **Options b, c and d**. This would mean increased activity for the crew and possibly less downtime between sets. The average mainline length in the fishery today is greater than any of the options, but industry has indicated they could fish with a shorter mainline. Limiting the number of hooks under **Alternative 3** may also affect fishing behavior depending upon the vessel's current practices. One industry representative indicated that 100 hooks per mile was about the minimum used as the farther spaced out they become the less catch that occurs if fish are congregated around one area. Based upon an average mainline length of between 6-7 miles **Option a** would be less than the minimum preferred by industry (G. Brooks, personal communication). **Preferred Option b and Option c** would be closer to the normal fishing practices. For those vessels that fish more hooks, a reduction in mainline length may occur to accommodate the reduction in allowable hooks. The options under **Alternative 4** to limit gangion length cover a wide range of fishing practices. There has been an increase in gangion length over the years as there seems to be higher catches of gag with the longer length. In the early days of the fishery a shorter length of 2 ft., **Option a,** was used and referred to as "broomsticks," but this length is rarely used if at all today. Depending upon vessel characteristics, options under **Alternative 4** that limit gangion length may have differing impacts depending upon other alternatives selected. As mentioned previously, there was interest by the industry to test various combinations of gear modifications to reduce interactions with hardshell sea turtles. Which combination of these alternatives and options would be preferred by most within the industry is unknown.

6.4.5 Direct and Indirect Effects on the Administrative Environment

Impacts to the administrative environment would not change under **Alternative 1**.
Alternatives 2, **3**, and **4** would create an additional need for law enforcement by limiting, mainline length, number of hooks per vessel, and gangion length. **Preferred Alternative 3** limits the number of hooks per vessel, which is easier for law enforcement to check than number of hooks per mile or set. Out of the other alternatives the **Preferred Alternative 3**, was discussed as a more enforceable alternative compared to **Alternatives 2** and **4**. As of May 6, 2007, all commercial reef fish vessels were required to have a functioning VMS. The VMS could aid law enforcement with monitoring fishing activities, but might not supply enough detail to distinguish alternatives in **Action 4**. **Alternative 2**, **3**, and **4** could be monitored by law enforcement at the dock before or after a scheduled trip.

6.5 Cumulative Effects Analysis (CEA)

As directed by the NEPA, federal agencies are mandated to assess not only the indirect and direct impacts, but cumulative impacts of actions as well. The NEPA defines a cumulative impact 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 other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 C.F.R. 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect is when the combined effects are greater than the sum of the individual effects.

This section uses an approach for assessing cumulative effects that was initially used in Amendment 26 to the Reef Fish FMP (GMFMC 2006) and is based upon guidance offered in CEQ (1997). The report outlines 11 steps for consideration in drafting a CEA for a proposed action.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.
2. Establish the geographic scope of the analysis.
3. Establish the timeframe for the analysis.
4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.
8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

Cumulative effects on the biophysical environment, socio-economic environment, and administrative environments are analyzed below.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.

The CEQ cumulative effects guidance states this step is accomplished through three activities as follows:

I. The direct and indirect effects of the proposed actions (Section 6.1-6.6);

II. Which resources, ecosystems, and human communities are affected (Sections 3 and 4); and

III. Which effects are important from a cumulative effects perspective (information revealed in this CEA)

2. Establish the geographic scope of the analysis.

The immediate areas affected by this action and analyzed in this CEA are the federal waters of the Gulf. These are the waters extending from the seaward side of the state waters of Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida state waters to 200 miles. There are five species of sea turtles that inhabit the Gulf. These are the loggerhead, green, Kemp's ridley, leatherback, and hawksbill. Three species of grouper comprise the bulk of the eastern Gulf commercial longline component. These species are gag and red grouper in the SWG complex, and yellowedge grouper in the DWG complex. Gag are more important to the commercial vertical line component of the fishery but were added to this analysis because of reports that certain longline gear modifications (e.g., longer gangions) have been developed to increase landings of this species. Tilefish are also found in deeper waters and are an important part of the of the deepwater component of the reef fish fishery. Brief descriptions of the distribution and habitat requirements for hardshell and other sea turtles and important reef fish species to the bottom longline component of the reef fish fishery are provided below.

Sea Turtles

Loggerhead sea turtles are the most commonly sighted turtle in the Gulf (NMFS and USFWS 2007e). This species is found throughout the temperate and tropical regions of the world's oceans. Surface sightings of this species are generally near shore during the summer, and further offshore in the winter. In western North Atlantic and Gulf waters, five nesting populations have been identified (North Carolina to northeast Florida, south-eastern Florida, Panhandle Florida, northern and eastern Yucatan Peninsula, and the Dry Tortugas). A large proportion of the large immature and mature loggerhead sea turtles are found off the southern and western coasts of Florida.

Green sea turtles are distributed circumglobally in tropical and subtemperate waters (NMFS and USFWS 2007a). Young green sea turtles, after hatching, are found along drift lines of algae and other debris where they are thought to feed on a variety of prey types. However, as they mature, they become herbivorous feeding primarily on marine grasses and algae in shallow bays, lagoons, and reefs (NMFS and USFWS 2007a). Important foraging habitat in the Gulf includes Texas bays and lagoons, the north-western coast of the Yucatan Peninsula, the Gulf off the Florida coast between Yankeetown and Tarpon Springs, Florida Bay, and the Florida Keys.

Hawksbill sea turtles are found mainly in the tropical regions of the Atlantic and Pacific oceans (NMFS and USFWS 2007b). In the northern Gulf, they are most commonly found off the Texas and Florida coasts. The largest nesting population occurs on beaches of the Yucatan Peninsula. Small juveniles are pelagic, but then are found on foraging grounds including coral reefs, hard bottoms, and mangrove-fringed bays. There they feed on sponges, bryozoans, coelenerates, and mollusks.

The Kemp’s ridley sea turtle is found in the western North Atlantic including the Gulf (NMFS and USFWS 2007c). This species primarily nests on a specific stretch of beach in Mexico (Rancho Nuevo). Near shore waters are thought to be important developmental habitat for juveniles. Here they feed on crabs, shrimp, mollusks, and fish. This species is known to move offshore and south off of Florida as waters cool in the winter.

Leatherback sea turtles are found in waters throughout the world (NMFS and USFWS 2007d). Nesting occurs on tropical beaches. Primary nesting beaches in the western Atlantic occur in French Guiana and Suriname. Little is known about this species. They are predominately pelagic and feed mainly on jellyfish.

Important Eastern Gulf Longline Species

Red grouper and gag account for the bulk of SWG landings in the eastern Gulf. Red grouper are found from Massachusetts to Brazil including the Gulf (Briggs 1958). They are most abundant on the Florida and Yucatan Shelves and are found in coastal waters and estuaries out to 300 ft. (Bullock and Smith 1991). Juveniles use estuarine seagrass beds and inshore reefs (patch and transitional reefs) as nursery areas (Sluka et al. 1994; Ross and Moser 1995). Adults are generally found over low relief hard bottom. Smith et al. (1975) frequently observed red grouper in diver surveys of the Florida Middle Ground. Sullivan and Sluka (1996) and Sluka and Sullivan (1996) reported that in the Florida Keys, red grouper inhabited reef-ridge, high relief spur and groove, and channel patch reefs. In the South Atlantic Bight, Huntsman (1976) found that most red grouper in headboat catches were caught at depths between 120 to 210 ft. Richardson and Gold (1997) examined genetic diversity in Gulf red grouper populations. They determined that stocks from the west Florida shelf and Campeche Banks could not be distinguished from each other and that red grouper in the Gulf should be considered a unit stock.

Gag are distributed in the western Atlantic from New York to Rio de Janeiro excluding the West Indies, and are abundant in the eastern Gulf (Briggs 1958). They are usually found in the Gulf from coastal waters to 250 ft. (Bullock and Smith 1991). Adults are generally found over reef and shelf-break habitats with males occurring further offshore (Koenig et al. 1996). Smith et al. (1975) found gag to be common in diver transects of the Florida Middle Ground. Juveniles recruit to estuarine seagrass beds in the spring at an age of about 40 to 43 days (Keener et al. 1988; Ross and Moser 1995; Koenig and Coleman 1998) and remain in the beds through the fall when they migrate to nearshore reefs. Bortone et al. (1994) reported juvenile and subadult gag on artificial reefs in nearshore waters of the Florida panhandle.

Yellowedge grouper are the major DWG species landed in the Gulf and found in the western Atlantic from North Carolina to southern Brazil, including the Gulf and the Caribbean (Cass-Calay and Bahnick 2002). They are found throughout the Gulf continental shelf, with areas of high abundance off of Texas and west Florida. On the outer continental shelf, the species occupies high-relief hard bottoms, rocky out-croppings and is often found co-occurring with snowy grouper and tilefish. Both adults and juveniles are also known to inhabit burrows. Major components of the diet comprise brachyuran crabs, fishes and other invertebrates. The species depth range is from 115 to 1,214 ft. with adults most common in waters greater than 591 ft. deep.

Tilefish occur in the Western Atlantic in deeper waters of the continental shelf from Nova Scotia to southern Florida and the Gulf (Steimle et al. 1999). The species is demersal, occurring at depths from 262 to 1,476 ft., but is most commonly found between depths of 820 to 1,148 ft. Preferred habitat is rough bottom and steep slopes. Spawning occurs in the months of March to November throughout the species range. Eggs and larvae are pelagic; early juveniles are pelagic-to-benthic. Nursery areas are found throughout the species range (Steimle et al. 1999). Late juveniles burrow and occupy shafts in the substrate. Adults also dig and occupy burrows along the outer continental shelf and on flanks of submarine canyons.

Commercial Sector of the Reef Fish Fishery

Vessels and dealers with reef fish permits are primarily found in Gulf states. Based on either mailing addresses or home ports, 98% of historical charter captain reef fish, 96% of for-hire reef fish, and 98% of commercial reef fish permitted vessels are located in Gulf states. For permitted reef fish dealers, 95% are located in Gulf states. Therefore, the primary affects of the actions in this amendment and on the reef fish fishery in general would likely be borne by participants in the Gulf region.

3. Establish the timeframe for the analysis

Sea Turtles

The hawksbill, Kemp's ridley, and leatherback sea turtles have been listed by the ESA as endangered since 1970. The green sea turtle was listed as threatened in 1978, with a designation as endangered off Florida and the Pacific coast. The loggerhead sea turtle was listed as threatened in 1978. Recently, NMFS and the USFWS published a report (Conant et al. 2009) on Western Atlantic distinct population segments (DPS) to determine the loggerhead's listing status (threatened or endangered).

Sea turtle populations have been assessed by NMFS since 1995 when the SEFSC established the Turtle Expert Working Group (TEWG). This group is a team of population biologists, sea turtle scientists, and life history specialists who are charged with compiling and examining information on the status of sea turtle species. Reports by the TEWG examining various aspects of sea turtle populations were published in 1998, 2000, 2007, and 2009.

The following is a list of reasonably foreseeable future management actions. These are described in more detail in Step 4.

- A listing petition to revise the status of loggerhead sea turtles to endangered.
- Based on documented hardshell sea turtle-fishery interactions, NMFS has identified several gear types that need to be addressed to reduce incidental capture of sea turtles. Trawl gear in other fisheries besides shrimp fisheries has been identified as a priority gear type to focus on to reduce sea turtle bycatch, given that takes are known to occur

these fisheries and that technology has been developed and tested to reduce those takes. The NMFS is developing a three-phased approach to regulating trawl fisheries.
- A BiOp analyzing the effects of the fishery managed under the Reef Fish FMP on endangered and threatened species.
- An interim rule is being developed to balance the protection of sea turtles with the allowance of a limited reef fish longline harvest.

Eastern Gulf Longline Component

Grouper stocks, the primary target of the eastern Gulf bottom longline component of the reef fish fishery, have been periodically assessed since 1991. Most assessments have focused on gag and red grouper, but yellowedge grouper (Cass-Calay and Bahnick, 2002), and goliath grouper (Porch et al., 2003; SEDAR 6, 2004b) have also been assessed. The SEDAR 10 (2006) gag stock assessment included data for analysis of stock status from 1963-2004 for commercial landings, and 1981-2004 for recreational landings. The SEDAR 12 (2007) red grouper stock assessment included landings data from 1986-2005 for both the commercial and recreational sectors. These assessments were updated in 2009 and included data through 2008 (SEDAR 2009b and 2009a, respectively). For gag, the catch data for both commercial and recreational sectors included a conversion of a portion of black grouper landings to gag to reflect misidentification of gag as black grouper, particularly during the 1980s and in the northern Gulf. In addition, most commercial grouper landings were not identified to species prior to 1986. Unclassified grouper landings are available from 1963-1985. Other reef fish species (red snapper, yellowtail snapper, vermilion snapper, gray triggerfish, hogfish, and greater amberjack) have also been assessed and a summary of these findings is presented in Section 3.2.1.

The following is a list of reasonably foreseeable future management actions. These are described in more detail in Step 4.

- Next assessments for gag and red grouper through SEDAR are scheduled to occur in mid-2011. A red snapper assessment update is also scheduled for 2009. SEDAR assessments for yellowedge grouper and tilefish are scheduled for 2010.
- Amendment 28 to the Reef Fish FMP is being developed. This amendment examines fair and equitable ways to allocate all FMP resources between recreational and commercial sectors.
- The Council will be developing either a Reef Fish amendment or a generic amendment to address ACLs and corresponding AMs. The reauthorized MSFCMA was enacted on January 12, 2007, and requires ACLs to be developed in 2010 for stocks subject to overfishing and 2011 for all other stocks.
- The Council has identified Reef Fish Amendment 32 to address potential management changes needed as a result of the red grouper and gag SEDAR updates. Specifically, gag has been determined to be overfished requiring a rebuilding plan, and the red grouper TAC will need to be reduced.

4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.

a. Past actions affecting sea turtle bycatch and the bottom longline component of the reef fish fishery (also see Section 1.3 History of Management).

Sea Turtles

- An informal ESA section 7 consultation was conducted on the Reef Fish FMP prior to its implementation in 1984. NMFS concluded the management measures proposed in the Reef Fish FMP were not likely to adversely affect any listed species under the ESA. The consultation, however, did not analyze the effects of the fishery itself.
- The effects of the Gulf reef fish fishery on endangered and threatened species were considered as part of an April 28, 1989, BiOp, which analyzed the effects of all commercial fishing activities in the Southeast Region. The BiOp concluded that commercial fishing activities in the Southeast Region were not likely to jeopardize the continued existence of any threatened or endangered species.
- Subsequent Reef Fish FMP Amendments 1-9, 11-17, and 19-22; 21 regulatory amendments; and two Secretarial plan amendments were either consulted on informally and found not likely to adversely affect any threatened or endangered species, or were determined to have no effect and not warrant consultation. All of these actions were found to not change the prosecution of the reef fish fishery in any manner that would significantly alter the potential impacts on endangered and threatened species or their designated critical habitats previously considered in the July 5, 1989, BiOp.
- NMFS published a final rule (66 FR 67495, December 31, 2001) detailing handling and resuscitation techniques for sea turtles that are incidentally caught during scientific research or fishing activities. Persons participating in fishing activities or scientific research are required to handle and resuscitate (as necessary) sea turtles as prescribed in the final rule.
- On July 6, 2004, NMFS published a final rule to implement management measures to reduce bycatch and bycatch mortality of Atlantic sea turtles in the Atlantic pelagic longline fishery (69 FR 40734). The management measures include mandatory circle hook and bait requirements, and mandatory possession and use of sea turtle release equipment to reduce bycatch mortality.
- The effects of the Gulf reef fish fishery on endangered and threatened species were considered as part of a February 15, 2005, BiOp, which analyzed the effects of all commercial fishing activities in the Southeast Region for Amendment 23. The BiOp concluded that commercial fishing activities in the Southeast Region were not likely to jeopardize the continued existence of any threatened or endangered species. However, the BiOp also identified reasonable and prudent measures to reduce sea turtle take by the fishery. To address these measures, NMFS published the final rule to implement sea turtle release gear requirements and sea turtle careful release protocols in the Gulf reef fish fishery (Amendment 18A) on August 9, 2006 (71 FR 45428). These measures require owners and operators of vessels with federal commercial or charter vessel/headboat permits for Gulf reef fish to comply with sea

turtle (and smalltooth sawfish) release protocols and have on board specific sea turtle release gear.

- Subsequent Reef Fish FMP amendments (Amendments 24-27 and 29-30B) and regulatory amendments were either consulted on informally and found not likely to adversely affect any threatened or endangered species, or were determined to have no effect and not warrant consultation. All of these actions were found to not change the prosecution of the reef fish fishery in any manner that would significantly alter the potential impacts on endangered and threatened species or their designated critical habitats previously considered in the February 15, 2005, BiOp.
- A final rule (70 FR 42508) was published on July 25, 2005, to allow any agent or employee of NMFS, the USFWS, the U.S. Coast Guard, or any other federal land or water management agency, or any agent or employee of a state agency responsible for fish and wildlife, when acting in the course of his or her official duties, to take endangered sea turtles encountered in the marine environment if such taking is necessary to aid a sick, injured, or entangled endangered sea turtle, or dispose of a dead endangered sea turtle, or salvage a dead endangered sea turtle that may be useful for scientific or educational purposes.
- NMFS implemented a series of regulations aimed at reducing potential for incidental mortality of sea turtles in commercial shrimp trawl fisheries. In particular, NMFS has required the use of turtle excluder devices (TEDs) in southeast United States shrimp trawls since 1989. These regulations have been refined over the years to ensure that TED effectiveness is maximized through proper placement and installation, configuration (e.g., width of bar spacing), floatation, and more widespread use.
- On August 3, 2007, NMFS published a final rule requiring selected fishing vessels to carry observers on board to collect data on sea turtle interactions with fishing operations, to evaluate existing measures to reduce sea turtle takes, and to determine whether additional measures to address prohibited sea turtle takes may be necessary (72 FR 43176). This rule also extended the number of days NMFS observers may be placed on vessels from 30 to 180 days.
- A revised recovery plan for the loggerhead sea turtle was published January 16, 2009 (74 FR 2995). The recovery plan for the Kemp’s ridley sea turtle is in the process of being updated. Recovery teams comprised of sea turtle experts have been convened and are currently working towards revising these plans based upon the latest and best available information.
- An emergency rule was requested by the Council restricting the bottom longline component of the reef fish fishery in the eastern Gulf to fishing outside of 50 fathoms until the DWG and tilefish quotas are filled. The quotas were filled in June 2009, at which point, the reef fish bottom longline component of the fishery was closed. The rule was effective May 18, 2009.

Eastern Gulf Longline Component

- A commercial grouper regulatory amendment established a 6,000 pound gutted weight aggregate DWG and SWG trip limit for the commercial grouper sector in January 2006.
- A March 2006 recreational grouper regulatory amendment established a recreational red grouper bag limit of one fish per person per day as part of the five-grouper per

person aggregate bag limit, prohibited for-hire vessel captains and crews from retaining bag limits of any grouper while under charter and established a recreational closed season for red grouper, gag, and black grouper from February 15 to March 15 each year.

- Reef Fish Amendment 18A examined enforcement and monitoring issues including a VMS requirement, changes to the framework for setting TAC for reef fish, and gear requirements for permitted reef fish vessels to carry turtle release gear. The final rule for this amendment was effective in September 2006, except for the VMS requirement which was effective in May 2007.
- Reef Fish Amendment 24 replaced the commercial reef fish permit moratorium with a permanent limited access system was implemented in August 2005.
- Joint Reef Fish/Coastal Migratory Pelagics (CMP) Amendment 25/17 replaced the for-hire reef fish and CMP permit moratorium with a permanent limited access system and was implemented in June 2006.
- Reef Fish Amendment 26 established an IFQ program for the red snapper component of the commercial reef fishery in the Gulf and was effective in time for the 2008 fishing year.
- Reef Fish/Shrimp Amendment 27/14 revised the red snapper rebuilding plan, provided measures to constrain the recreational harvest to its quota, and provided measures to minimize bycatch in the reef fish and shrimp fisheries. Bycatch reduction measures include permitted reef fish vessels having specific bycatch reduction gear onboard. The final rule for this amendment published in January 2008.
- The final rule for the Council's Amendment 30A published in July 2008. This rule established ACLs and AMs for greater amberjack and gray triggerfish, set quotas for greater amberjack and gray triggerfish, increased the minimum size and reduced the bag limits for greater amberjack, and increased the minimum size limit for gray triggerfish.
- Amendment 30B was approved by the Secretary in January 2009 and a final rule has published (effective May 18, 2009), except for the "Edges" portion for area closures, which was effective June 24, 2009. The purpose of the amendment is to end overfishing of gag, revise red grouper management measures as a result changes in the stock condition, establish ACLs and AMs for gag and red grouper, manage SWG to achieve OY, and improve the effectiveness of federal management measures. In addition, Amendment 30B established management targets and thresholds for gag consistent with the requirements of the SFA, set the gag and red grouper TAC, and established interim allocations for the commercial and recreational gag and red grouper fisheries.
- Because regulations ending overfishing for gag were not expected to be implemented by January 1, 2009, the Council requested NMFS develop an interim rule to put in place such regulations for the 2009 fishing year. This interim rule published December 2, 2008, and was effective January 1, 2009.
- Emergency rule effective May 18, 2009 – see above under Sea Turtles.
- Amendment 29 to the Reef Fish FMP was approved by the Secretary July 2009. This amendment establishes a grouper and tilefish IFQ program for the commercial reef fish fishery.
- The Generic Aquaculture Amendment was approved in September 2009. This

amendment provides a programmatic approach to evaluating the impacts of aquaculture proposals in the Gulf and a comprehensive framework for regulating such activities.

b. The following are recent Council or NMFS actions not summarized in Section 1.3 and CEA step 4a but are important to the eastern Gulf longline fishery in general.

Sea Turtles
The NMFS has initiated a review of the status of the loggerhead sea turtle to determine whether the action is warranted to change the current listing under the ESA from threatened to endangered. The loggerhead sea turtle is currently listed as threatened throughout its range. NMFS was petitioned on November 16, 2007, by Oceana and the Center for Biological Diversity requesting that loggerhead sea turtles in the western North Atlantic Ocean be reclassified as a DPS and that it and its essential habitat be reclassified as endangered.

In early 2008, NMFS established a Loggerhead Biological Review Team to assess the loggerhead population structure globally to determine whether DPSs exist and, if so, to assess the status of each DPS. The Loggerhead Biological Review Team reviewed and synthesized information, rendered an expert opinion, and prepared a written report (Conant et al. 2009). This report concluded that all loggerhead subpopulations are faced with a multitude of natural and anthropogenic factors that negatively influence the status of the species.

The NMFS has initiated a gear-based approach to address sea turtle bycatch (M. Barnette, SERO, personal communication). Certain types of fishing gear are more prone to the incidental capture of sea turtles than others, depending on the design of the gear, the way the gear is fished, and/or the time and area within which it is fished. An evaluation of sea turtle interactions by gear type provides a more comprehensive assessment of fishery impacts across fishing sectors as well as across state, federal, and regional boundaries. Through this strategy, NMFS seeks to address sea turtle bycatch across jurisdictional boundaries and fisheries for gear types that have the greatest impact on sea turtle populations.

Based on documented sea turtle-fishery interactions, NMFS has identified several gear types that need to be addressed to reduce incidental capture of sea turtles. Trawl gear has been identified as a priority for reducing sea turtle bycatch. The NMFS is now working to develop and implement bycatch reduction measures for trawl fisheries in addition to the shrimp fishery in the Atlantic and Gulf. Information examined included when and where sea turtle takes have occurred or where gear, time, location, fishing method, and other similarities exist between a particular trawl fishery and a trawl fishery where sea turtle takes have occurred. Turtle excluder devices have been proven an effective method to minimize adverse effects related to sea turtle bycatch in the shrimp trawl fishery and, where applicable, in the summer flounder trawl fishery. Under the above strategy, there will be a phased approach to regulating trawl fisheries. Based on the development and testing of the appropriate TED technology, some trawl fisheries may be required to use TEDs. Those fisheries in which TEDs are not appropriate may be regulated by other means, such as time and area closures.

The NMFS has also been working to develop a TED, which can be effectively used in a type of trawl known as a flynet, which is sometimes used in the Mid-Atlantic and Northeast fisheries to target sciaenids and bluefish. Limited observer data indicate that takes can be quite high in this fishery. A top-opening flynet TED was certified in 2007, but experiments are still ongoing to certify a bottom-opening TED.

Eastern Gulf Longline Component

An IFQ program (Amendment 26) for the commercial red snapper component of the reef fish fishery was implemented in January, 2007 (GMFMC 2006). Each qualifying fisherman received a percentage share of the available commercial quota (See Amendment 27/14 above) based on previous historical landings. Fisherman can now fish for red snapper as necessary to keep markets supplied year-around and expend some of their previous fishing effort toward other reef fish such as vermilion snapper or grouper. Alternate targeted species or bycatch may include gag, red grouper, or other grouper species.

The Council approved a regulatory amendment to rescind all management of the vermilion snapper management measures implemented by GMFMC (2004b). A new stock assessment indicated that those measures were not necessary and, in fact, the stock was being fished at a yield equivalent to that at F_{OY}. A rule to address actions in this amendment published in January 2008.

At their November 2007 meeting, the Council recognized the difficulties involved in decisions allocating reef fish TACs between recreational and commercial sectors. They established an Allocation Ad Hoc Committee to develop fair and equitable ways to allocate all FMP resources between recreational and commercial sectors. These principles for setting allocations are designed make decision making more transparent and understandable to the various sectors in the fishery. Amendment 28 will likely be the amendment addressing allocation.

The MSFCMA was reauthorized on January 12, 2007. It added provisions strengthening the requirements to end and prevent overfishing and rebuild U.S. stocks. It requires ACLs and corresponding AMs to ensure that overfishing does not occur. It also requires conservation and management measures be prepared and implemented within two years of notification that a stock is “overfished” or “subject to overfishing” in order to end overfishing immediately and begin rebuilding stocks. NMFS understands an ACL to mean a specified amount of a fish stock (e.g., measure of weight or numbers of fish) for a fishing year that is a target amount of annual total catch that takes into account projected estimates for landings and discard mortality from all user groups and sectors. The MSFCMA restricts ACLs from exceeding the recommendations of Council SSCs and plan amendments specify mechanisms for establishing ACLs. Measures are required by the MSFCMA to ensure accountability and ACLs will need to be developed in 2010 for stocks subject to overfishing and 2011 for all other stocks. Either a reef fish amendment or a generic amendment would be necessary to establish ACLs and AMs for reef fish stocks. Amendments 30A and 30B address catch limits and AMs for greater amberjack, gray triggerfish, gag, red grouper, and SWGs. However, these measures may be revised in a future amendment as ACLs and AMs are developed for other reef fish stocks not overfished or not undergoing overfishing.

c. The following are non-FMP actions which can influence sea turtles and the reef fish fishery.

Sea Turtles

The following refers to loggerhead sea turtles and is taken from a work being developed for a new BiOp for the reef fish fishery. Because non fishery threats to loggerhead sea turtles are similar to those for other sea turtle species, the following discussion, while focused on loggerhead sea turtles, would be applicable to the other species occurring in the Gulf.

The five-year status review of loggerhead sea turtles recently completed by NMFS and the USFWS provides a summary of natural as well as anthropogenic threats to loggerhead sea turtles (NMFS and USFWS 2007e). The diversity of a sea turtle's life history leaves them susceptible to many natural and human impacts, including impacts while they are on land, in the benthic environment, and in the pelagic environment. Hurricanes are particularly destructive to sea turtle nests. Sand accretion and rainfall that result from these storms as well as wave action can appreciably reduce hatchling success. For example, the report cites that all of the eggs over a 90-mile length of coastal Florida were destroyed in 1992 by storm surges on beaches that were closest to the eye of Hurricane Andrew (Milton et al. 1994). Also, many nests were destroyed during the 2004 and 2005 hurricane seasons. Other sources of natural mortality include cold stunning and biotoxin exposure.

Anthropogenic factors that impact hatchlings and adult female sea turtles on land, or the success of nesting and hatching include: beach erosion, beach armoring and nourishment, artificial lighting, beach cleaning, increased human presence, recreational beach equipment, beach driving, coastal construction and fishing piers, exotic dune and beach vegetation, and poaching. An increase in human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, feral hogs, dogs and an increased presence of native species (e.g., raccoons, armadillos, and opossums) which raid and feed on sea turtle eggs. Although sea turtle nesting beaches are protected along large expanses of the northwest Atlantic coast (in areas like Merritt Island, Archie Carr, and Hobe Sound National Wildlife Refuges), other areas have limited or no protection. Sea turtle nesting and hatching success on unprotected high density east Florida nesting beaches from Indian River to Broward County are affected by all of the above threats.

Loggerhead sea turtles are affected by a completely different set of anthropogenic threats in the marine environment. These include oil and gas exploration, coastal development, transportation, marine pollution, underwater explosions, hopper dredging, offshore artificial lighting, power plant entrainment and/or impingement, entanglement in debris, ingestion of marine debris, marina and dock construction and operation, boat collisions, and poaching. In addition, loggerhead sea turtles may also be facing a new threat from a little understood disease that could be either natural or anthropogenic. From October 5, 2000, to March 24, 2001, 49 debilitated loggerheads associated with the disease were found in southern Florida from Manatee County on the west coast through Brevard County on the east coast (Foley 2002). To date, the illness and epidemic has not been associated with any one specific pathogen or toxin. If the agent responsible for debilitating these sea turtles re-emerges in Florida, and if the agent is infectious, nesting females could spread the disease throughout the range of the adult loggerhead population.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Environmental Protection Agency's (EPA) climate change webpage provides basic background information on these and other measured or anticipated effects. However, the impacts on sea turtles for the most part cannot be predicted with any degree of certainty.

The Intergovernmental Panel on Climate Change has stated that global climate change is unequivocal (IPCC 2007) and its impacts may have significant impacts to the hatchling sex ratios of loggerhead sea turtles (NMFS and USFWS 2007e). In marine turtles, sex is determined by temperature in the middle third of incubation with female offspring produced at higher temperatures and males at lower temperatures within a thermal tolerance range of 25º-35°C (Ackerman 1997). Increases in global temperature could potentially skew future sex ratios toward a higher numbers of females (NMFS and USFWS 2007e). Modeling suggests that an increase of 2°C in air temperature would result in a sex ratio of over 80% female offspring for loggerheads nesting near Southport, North Carolina. The same increase in air temperatures at nesting beaches in Cape Canaveral, Florida, would result in close to 100% female offspring. More ominously, an air temperature increase of 3°C is likely to exceed the thermal threshold of most clutches, leading to death (Hawkes et al. 2007). Warmer sea surface temperatures have been correlated to an earlier onset of loggerhead nesting in the spring (Weishampel et al. 2004; Hawkes et al. 2007), as well as short inter-nesting intervals (Hays et al. 2002), and shorter nesting season (Pike et al. 2006).

The effects from increased temperatures may be exacerbated on developed nesting beaches where shoreline armoring and construction have denuded vegetation. Erosion control structures could potentially result in the permanent loss of nesting beach habitat or deter nesting females (NRC 1990). Alternatively, females may nest on the seaward side of the erosion control structures, potentially exposing them to repeated tidal overwash (NMFS and USFWS 2007e). Sea level rise from global climate change (IPCC 2007) is also a potential problem, particularly for areas with low-lying beaches where sand depth is a limiting factor, as the sea may inundate nesting sites and decrease available nesting habitat (Daniels et al. 1993, Fish et al. 2005, Baker et al. 2006). The loss of habitat as a result of climate change could be accelerated due to a combination of other environmental and oceanographic changes such as an increase in the frequency of storms and/or changes in prevailing currents, both of which could lead to increased beach loss via erosion (Antonelis et al. 2006, Baker et al. 2006).

Other changes in the marine ecosystem caused by global climate change (e.g., salinity, oceanic currents, dissolved oxygen levels, nutrient distribution, etc.) could influence the distribution and abundance of phytoplankton, zooplankton, submerged aquatic vegetation, crustaceans, mollusks, forage fish, etc., which could ultimately affect the primary foraging areas of loggerhead sea turtles.

Eastern Gulf Longline Component

The demand for liquefied natural gas (LNG) is increasing. To meet this demand, 15 new LNG terminals are proposed for the Gulf and one LNG currently exists in Lake Charles, Louisiana. Nine of the proposed facilities are closed loop systems that will not impact fishery resources, but six proposed facilities would each circulate approximately 100-200 million gallons of water per day to heat the liquefied natural gas back to its gaseous phase. Each facility would impact billions of fish eggs, larvae, and plankton each year. All fish eggs and larvae are assumed to be killed after passing through these systems. NMFS and the Council are concerned about the potential impact of these facilities on fish populations in the Gulf. One facility at Sabine Pass, Texas would filter 30% of the water in Sabine Lake each year. Because most reef fish have pelagic larvae (see Section 3.2.2), some species may be affected by these facilities. The EPA has required the power generating industry to use closed loop systems to mitigate impacts on aquatic biota.

The hurricane season is from June 1 to November 30, a time period accounting for 97% of all tropical activity affecting the Atlantic Basin (NOAA, 2007). These storms, although unpredictable in their annual occurrence, can devastate areas of the Gulf when they occur. For example, the 2005 hurricane season was the busiest and costliest on record. There were 28 named storms, including 15 hurricanes, four of which reached category 5 strength. Along the Gulf coast from the Florida Panhandle to Texas, five named storms (Tropical Storm Arlene and Hurricanes Cindy, Dennis, Katrina, and Rita) made landfall. Hurricanes Katrina (landfall August 29, 2005) and Rita (landfall September 24, 2005) were the most devastating of these storms, impacting an area stretching from eastern Texas to western Alabama and resulting in significant physical and economic damage to coastal communities. These storms exacerbated problems from the active 2004 hurricane season, especially Hurricane Ivan which caused extensive damage in the Orange Beach, Alabama – Pensacola, Florida area. Direct losses to the fishing industry and businesses supporting fishing activities included: loss of vessels, loss of revenue due to cancelled fishing trips, and destruction of marinas and other fishery infrastructure (Walker et al. 2006). However, while these effects may be temporary, those fishing related businesses whose profitability is marginal may be put out of business should a hurricane strike.

Due to the continuing rise in the cost of fishing, including increases in the cost of fuel and insurance, along with other increases in operating costs, it is becoming more difficult for many fishermen to make a living fishing. For example, 2007 fuel prices have increased nearly 2.5 times since 2002 (GMFMC 2007). This could have negative impacts on communities that are dependent on jobs that support reef fish fisheries. Reductions in TAC could result in shorter seasons for various fisheries. This may also impact the businesses that are dependent on the commercial and recreational reef fish fisheries in that there will be fewer days to sell charter services, ice, fuel, tackle, hotel rooms, and other services to people participating in the fishery.

Eighty percent of seafood consumed in the United States is imported and the amount being imported has been steadily increasing (NMFS 2007). For reef fish, imports between 1993 and 2006 increased from a low of 22 mp in 1994 to a high of 49.7 mp in 2005 (See Section 3.3.1 – Imports). This compares to average domestic Gulf grouper annual landings of 18.4 mp over this same time period. Domestic annual Gulf grouper landings have been declining since reaching a peak of 20.5 mp in 2002. The value of imports has increased from a low of $42.3 million in 1994 to $101.7 million in 2006 and is greater than domestic products which peaked in value in 2001 at $50.1 million. It should be noted the numbers presented above are not directly comparable because of differences in product such as fresh versus frozen, but the difference in magnitudes between the domestic harvests and imports shows the large market share of imports in the reef fish market. The effects of imports on domestic fisheries can cause fishermen to lose markets during fishery closures as dealers and processors use imports to meet demand, and limit the price fishermen can receive for their products through the competitive pricing of imports.

Global climate changes could have significant effects on Gulf fisheries. However, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002). Modeling of climate change in relation to the northern Gulf hypoxic zone may exacerbate attempts to reduce the area affected by these events (Justic et al. 2003).

Actions from this amendment could increase or decrease the carbon footprint from fishing. Should reef fish bottom longline vessels affected by this action convert to other types of fishing gear such as vertical line (see Section 4.3), then the carbon footprint from the reef fish fishery could increase due to more frequent trips and contribute more to global warming. If instead, these vessels are retired from the fishery and are either scrapped or used for other purposes that reduce their operations, then the carbon footprint from the operation of this fishery would be reduced and contribute less to climate change.

It is unclear how climate change would affect reef fishes, and likely would affect species differently. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact Gulf reef fish species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts will occur. Actions in this amendment are expected to reduce effort and thereby decrease fishing mortality; thus these actions may partially mitigate the negative impacts of global climate change on reef fish species.

5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.

This step should identify the trends, existing conditions, and the ability to withstand stresses of the environmental components. According to the CEQ guidance describing stress factors, there are two types of information needed. The first are the socioeconomic driving variables identifying the types, distribution, and intensity of key social and economic activities within the region. The second are the indicators of stress on specific resources, ecosystems, and communities.

Sea Turtles

With the exception of loggerhead sea turtles, the populations of the other four species of sea turtles found in the Gulf were either stable or improving. For green sea turtles, a five-year status review found improvements in the number of green sea turtles nesting in eight geographic areas considered to be primary nesting sites in the Atlantic/Caribbean, and reviewed the trend in nest count data for each (NMFS and USFWS 2007a). A similar trend was found for hawksbill sea turtles by Meylan (1999) at the two principal nesting beaches in the U.S. Caribbean and for Kemp's ridley sea turtle by USFWS (2000) and TEWG (2000) at sites located in Mexico. For leatherback sea turtles, the population status is uncertain because in some areas, the number of nesting sea turtles has declined, while in other locations, it has been increasing (TEWG 2007).

The most common bycatch sea turtle species in the eastern Gulf bottom longline component of the reef fish fishery is the loggerhead sea turtle. Analyses of nesting data from 1989-2005 by the Florida Fish and Wildlife Research Institute indicates there is a significant declining trend in nesting at beaches utilized by the south Florida nesting subpopulation (Witherington et al. 2009). Witherington et al. (2009) has argued this decline may be the result of an actual decline in the number of adult female loggerheads in the population; however, this is conjecture at this time. Conant et al. (2009) modeled the northwest Atlantic loggerhead sea turtle population at its maximum population growth rate and computed the population growth potential under known or suspected threats to different life stages. Using this approach, the model indicates the Northwest Atlantic Ocean DPS is likely to decline in the foreseeable future, even under the scenario of the lowest anthropogenic mortality rates. These results are largely driven by mortality of juvenile and adult loggerheads from fishery bycatch that occurs throughout the North Atlantic Ocean. Therefore, Conant et al. (2009) concluded that the Northwest Atlantic Ocean DPS is currently at risk of extinction.

Reef Fish

Major stresses to reef fish stocks have primarily come from overfishing which has either occurred for several species (e.g., red and goliath grouper), or is currently occurring for others (e.g., gag and greater amberjack). Trends in landings and the status reef fish stocks are summarized in Section 3.2 and are based on NMFS and SEDAR stock assessments. The following discussion summarizes information on stocks common in the eastern Gulf bottom longline component of the reef fish fishery whose status has been evaluated.

Estimated catches of gag (landings and dead discards) from 1998 to 2004 have exceeded catches in earlier years. The 2004 catch was about 85% higher than the highest estimated catches from before 1998 and about 75% higher than the more recent catches (1999) used in the last assessment. Commercial landings since the late 1990's have increased about 60% compared to the 1980's and estimated recreational landings have almost doubled from the 1980's. As would be expected, estimated annual fishing mortality rates (Fs) have also generally increased from about 0.2 in the mid-1970s to about 0.5 in 2004.

The estimated gag spawning stock biomass declined during the late 1960's and the 1970's, remained at about 20 mp during the 1980's and early 1990's. The spawning stock biomass then increased from 1997 to 2001, perhaps as a result of the higher recruitment. In recent years, estimated total biomass peaked at about 56 mp in 2002 and then declined to an estimated 51 mp in 2004.

Gag are considered to be undergoing overfishing (SEDAR 10 2006; SEDAR 2009b) and are overfished (SEDAR 2009b). Amendment 30B defined the overfished threshold (MSST) for gag. The Council is currently developing a plan to end gag overfishing and rebuild the stock in Amendment 32.

For red grouper, total landings are variable with an overall declining trend from 1986 to 1998 (9 to 4.6 mp). Total landings then increased to nearly 8 mp in 1999 where they have stabilized through 2005 averaging 7.5 mp. Within sectors, commercial longline landings gradually increase during between 1986 and 2005. Commercial handline landings declined considerably over the same time period from 3.74 mp in 1990 to less than 1 mp in 1998, but have increased to 1.5 mp in recent years. Recreational landings have been less than total commercial landings. With the exception of the 1995-1997 period when landings were much lower than average, recreational landings have fluctuated between 1 and 3 mp. From 1986, F increased steadily, peaking in 1993. After 1993, F declined through 1998. Fishing mortality increased slightly in 1999, but has been on another downward trend through 2005.

Red grouper stock abundance has averaged approximately 27.6 million fish and varies with little trend between 1986 and 1999. However, abundance jumped sharply in 2000 to 40.5 million fish when a strong 1999 year class entered the fishery. Spawning stock is measured as total female gonad weight. The estimated spawning stock has gradually improved since 1986 from just below 500 metric tons (mt) of eggs in late 1980's to over 700 mt in the last few years including the observed high of 752 mt of eggs in 2005.

A stock assessment conducted in 1999 indicated red grouper were overfished and undergoing overfishing in the 1997, the last year of data used in the assessment. A subsequent 2007 assessment using data through 2004, indicated the stock was no longer overfished or undergoing overfishing. The change in status was in part due to a strong recruitment year in 2000. Although not overfished, the 2009 stock assessment update (SEDAR 2009a) suggests harvest levels need to be reduced from those based on SEDAR 12 (2007) analyses. The Council is developing Amendment 32 which will include the setting of revised red grouper TAC and ACLs.

The status of the yellowedge grouper stock remains essentially undetermined. An age-structured stock assessment model for yellowedge grouper in the Gulf was conducted in 2002 (RFSAP 2002). The model was very sensitive to input parameters, and small changes in highly uncertain parameters resulted in large changes in the estimated status of the stock. Therefore, the RFSAP concluded that the analysis of the stock was insufficient to determine the status of the stock relative to the definitions of overfished and overfishing (RFSAP, 2002). However, because of the longevity of yellowedge grouper, they may be particularly susceptible to even relatively low fishing mortality rates. The RFSAP recommended that the commercial yield should not greatly exceed the historical average of 0.84 million pounds. The current DWG quota is 1.02 mp.

No assessment has been conducted on Gulf tilefish. Landings increased from the 1960's and peaked in 1988 at over 1 mp. From 1997 to 2006, annual landings have fluctuated between 431,000 and 734,000 pounds. The current tilefish quota is 440,000 pounds.

Ecosystem

With respect to stresses to the ecosystem from actions in this amendment, changes in the gag and red grouper fisheries are not likely to directly create additional stress. Vertical gear and longlines can damage habitat through snagging or entanglement, however, as described in Sections 6.2.1 and 6.2.2, these impacts are minimal. Changes in the population size structure as a result of shifting grouper fishing selectivity and increases in stock abundance could lead to changes in the abundance of other reef fish species that compete with grouper for shelter and food. Predators of grouper species could increase if grouper abundance is increased, while species competing for similar resources as groupers could potentially decrease in abundance if less food and/or shelter are less available. Efforts to model these interactions are still in their development stages, and so predicting possible stresses on the ecosystem in a meaningful way is not possible at this time.

Reef Fish Fisheries

Data used to monitor commercial reef fish effort includes the number of vessels with landings, the number of trips taken, and trip duration. Declines in effort may be a signal of stress within the fishery. These trends are described in Sections 2, 3.3, and 6.1-6.5, and briefly summarized here. While landings in the reef fish fishery have shown patterns of increases and decreases, the numbers of vessels actively participating in the reef fish fishery (except for gag) show a pattern of decline over time. For SWG, the average number of vessels with landings for the years 1993-1998 fell, from 1,059 to 791 in 2005-2006, and for red grouper landings for the years 1993-1998 fell, from 797 to 666, respectively (Table 3.3.1.2). For DWG vessel landings fell from 399 to 330 and for tilefish vessel landings fell from 231 to 215. This same trend is reflected by the reef fish fishery as a whole. The number of permitted vessels, which has remained relatively constant, is greater than the number of vessels having landings. This suggests there are permits not actively employed in the fishery, but could be used in the event noticeable improvements in the fishery occur. This reduction in the numbers of vessels participating in the fishery also reflects a decline in the number trips taken and days away from port by the fishery as a whole.

There are several potential reasons for the decline in effort for reef fish, SWG, and DWG. These include an increase in fishing costs, increases in harvesting efficiency, more restrictive regulations (particularly for the grouper component of the fishery), and even improvements in the stock status of certain species (effort shifting). However, data currently is inadequate to determine which factors contribute the most to declines in fishing effort for reef fish and grouper, and what might be the causes for the apparent increase in fishing effort for gag.

Social and economic characteristics of recreational anglers are collected periodically as an add-on survey to the MRFSS. Data used to monitor recreational reef fish effort in the fishery primarily comes from MRFSS and includes the number of total trips and the number of trips that catch individual species. As with the commercial sector, declines in effort may be a signal of stress within the fishery. These trends are described in Section 3.3.2. The level and pattern of change in recreational effort has remained about flat from 1993 through 1996, fluctuated between 1997 and 1999, and then increased relatively fast since 2000. Private and charter fishing modes accounted for most of grouper target trips, with the charter mode the most common mode for red grouper and private the most common for gag. For both species, Florida accounts for most landings; however, landings in Alabama have been increasing in recent years.

Summary characteristics of the for-hire fleet were analyzed as part of the analyses for the development of the current limited access system (GMFMC 2005b). These analyses indicated for-hire operations were generally profitable. Costs associated with these businesses include bookkeeping services, advertising and promotion, fuel and oil, bait expenses, docking fees, food/drink for customers and crew, ice expenses, insurance expenses, maintenance expenses, permits and licenses, and wage/salary expense. Most vessels carry per trip about half of the maximum passenger capacity. Therefore, substantial excess capacity exists in the sector. As with the commercial sector, increases in fishing costs, increases in harvesting efficiency, more restrictive regulations (particularly for the grouper component of the fishery), and changes in the stock status of certain species may affect effort in this sector.

The rapid disappearance of working waterfronts has important implications for the disruption of various types of fishing related businesses and employment within fishing communities. The process of "gentrification" which tends to push those of a lower socio-economic class out of traditional communities as property values and taxes rise has become common along coastal areas of the U.S. and around the world. Working waterfronts tend to be displaced with development that is often stated as the "highest and best" use of waterfront property, but often is not associated with water dependent occupations. With the continued removal of these types of businesses over time the local economies becomes less diverse and more reliant on the service sector and recreational tourism. As home values increase, people in lower socio-economic class find it difficult to live within these communities and consequently spend more time and expense commuting to work if jobs continue to be available. Newer residents often have no association with the water dependent employment and may see that type of work and its associated gear as unappealing to the aesthetics of the community and may work to remove fishermen from traditional workspaces through changes in zoning laws and restrictions. These processes make fishing communities less resilient and more vulnerable to other social and economic disruptions that may result from increased regulation. Some of the communities affected by this amendment may be experiencing these types of stressors and be less resilient in the face of this and other regulation.

6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.

This section examines whether resources, ecosystems, and human communities are approaching conditions where additional stresses could have an important cumulative effect beyond any current plan, regulatory, or sustainability threshold (CEQ 1997). Sustainability thresholds can be identified for some resources, which are levels of impact beyond which the resources cannot be sustained in a stable state. Other thresholds are established through numerical standards, qualitative standards, or management goals. The CEA should address whether thresholds could be exceeded because of the contribution of the proposed action to other cumulative activities affecting resources.

Sea Turtles

When the action of a federal agency may affect a species protected under the ESA, that agency is required to consult with either NMFS or USFWS, depending on the protected species that may be affected. Consultations on most listed marine species are conducted between the action agency and NMFS. Consultations are concluded after NMFS issues a BiOp. A summary of these BiOps is listed in Step 4.

The incidental take statement from the 2005 BiOp provided thresholds for hardshell sea turtle take. These take levels (total and lethal take) for the five hardshell sea turtles are indicated in Table 1.1.1. As stated in Section 1, the purpose for Amendment 31 is to reduce the hardshell sea turtle take, particularly for loggerhead sea turtles, by the eastern Gulf bottom longline component of the reef fish fishery. This component of the fishery exceeded the 2005 BiOp authorized incidental take for hardshell sea turtles and in particular loggerhead sea turtles. The effect of actions taken in this amendment would be to reduce hardshell sea turtle take to lower levels, which in turn should benefit sea turtle populations.

Grouper and Tilefish

No thresholds or benchmarks have been set for many grouper or tilefish species. However, they have been set for many of the species that comprise the bulk of the bottom longline component of the reef fish fishery. Amendment 1 to the Reef Fish FMP, implemented in 1990 before the Sustainable Fisheries Act (SFA) was passed, established the minimum spawning stock biomass at 20% SPR for all reef fish species. The Generic SFA Amendment proposed SFA definitions for OY, MSST, and MFMT for three reef fish species and generic definitions for all other reef fish. The definition of MFMT for other reef fish which includes grouper species, $F_{30\%SPR}$, was approved and implemented. Definitions for OY and MSST were disapproved because they were not biomass-based.

The recent assessment conducted for gag in 2006 under the SEDAR stock assessment process (SEDAR 10 methods and results are summarized in Section 3.2) suggests the stock is undergoing overfishing based on data through 2004. This assessment was updated with information through 2008 and suggests the stock may not only be undergoing overfishing, but may also be considered overfished (SEDAR 2009b). A brief description of the stock and its status can be found in step 5 of this CEA. Measures approved in Amendment 30B are designed to immediately relieve stress on the gag stock and over the next six years relieve stress on the ecosystem. Landings will initially be reduced by approximately 29 to 45%. Amendment 32 is being developed to end gag overfishing immediately and rebuild the stock.

For red grouper, SFA compliant thresholds and targets were defined in Secretarial Amendment 1. MFMT is defined as the fishing mortality rate at MSY. MSST is defined as $(1\text{-M})*B_{MSY}$ with natural mortality (M) equal to 0.14. MSY is the yield associated with F_{MSY} when the stock is at equilibrium and OY is the yield associated with fishing at 75% of F_{MSY} when the stock is at equilibrium.

A new stock assessment for red grouper was completed in 2007 using an age-structured production model (SEDAR 12 2007). The assessment and its results are summarized in Amendment 30B. Based on landings data from 1986 to 2005, this assessment indicated the stock had recovered from an overfished state in 1999 and so is no longer considered overfished. The assessment also indicted the stock was no longer undergoing overfishing. Therefore, harvest constraints currently placed on the stock as it recovered are being relaxed through Amendment 30B rulemaking so the stock can be harvested at OY. However, the harvest level and harvest constraints may need to be reduced given preliminary results from the 2009 stock assessment update (SEDAR 2009a). These will be examined in Amendment 32.

Stock assessments have been conducted for yellowedge grouper (Cass-Calay and Bahnick 2002) and goliath grouper (Porch et al. 2003; SEDAR 6 2004b). However, the stock status of these species is uncertain. The assessment for yellowedge grouper concluded the stock condition was unknown and the assessment for Goliath grouper indicated the stock was still overfished. A review of the Nassau grouper's stock status was conducted by Eklund (1994), and updated estimates of generation times were developed by Legault and Eklund (1998).

Reef Fish Fisheries
As indicated above, both commercial and for-hire fisheries are subject to stress as a result of increases in fishing costs, increases in harvesting efficiency, more restrictive regulations (particularly for the grouper fishery), and changes in the stock status of certain species (effort shifting). Reductions in revenues to and expenditures by these entities would likely be felt in the fishery infrastructure. For the reef fish fishery as a whole, an indicator of stress would be a decline in the number of permitted reef fish vessels. For the commercial sector, the number of vessels landing either SWG or red grouper has been decreasing (see Section 3.3.1). However, the number of permitted reef fish vessels has remained the same at about 1,000 vessels over the past few years. This indicates some reef fish fishermen are not participating in the red grouper or SWG components of the fishery. Whether they are holding their permits as speculation for selling their permit, or waiting until reef fish prices improve to a point where returning to the fishery becomes more profitable is unknown.

The for-hire sector would not directly be affected by this action. Analyses conducted on the effects of a limited access program for for-hire vessels indicated operations were generally profitable (GMFMC 2005b). However, testimony from for-hire operators in light of recent red snapper regulations have suggested some for-hire operators may go out of business, particularly in the northeastern Gulf (GMFMC 2007). Best available survey and modeling results indicate that relatively few trip cancellations were expected to occur as a result of regulations on the red snapper component of the fishery stemming from Amendment 27/14. Most survey respondents indicated that when faced with a reduced or zero red snapper bag limit, they would either continue fishing for red snapper or fish for another species. Fishing for other species may generate distributional effects (i.e., the trips may occur from different ports, modes, or seasons, resulting in one port/entity/season losing business while another gains). These distributional effects, however, cannot be predicted with current data. Further, for at least red snapper trips, preliminary data through August 2007 did not support claims of widespread reductions in charter business as a result of more restrictive red snapper measures. Thus, based on inference from the red snapper for-hire fishery, while it is possible some for-hire fishermen may go out of business as a result of recent actions from other reef fish amendments, the for-hire fishery as a whole is not believed to be experiencing widespread declines or economic harm. This amendment, because it does not include proposed management actions for the for-hire industry, should have no direct effects on this component of the reef fish fishery.

7. Define a baseline condition for the resources, ecosystems, and human communities.

The purpose of defining a baseline condition for the resource and ecosystems in the area of the proposed action is to establish a point of reference for evaluating the extent and significance of expected cumulative effects.

Sea Turtles

As mentioned in Step 3 of the CEA, all five species of sea turtles found in the Gulf were listed under the ESA in the 1970's. Additionally, NMFS has been assessing sea turtle populations since 1995 when the SEFSC established the TEWG. The TEWG has released reports in 1998, 2000, and 2007.

Many of the sea turtle population assessments are dependent on nesting beach surveys to provide trends in abundance. For green sea turtles whose abundance in the western Atlantic appears to be increasing, major nesting beaches have been surveyed starting in the 1970s to 1980s depending on the beach (NMFS and USFWS 2007a). Abundances in some areas for the hawksbill sea turtle have also showed increasing trends. Data used to assess this species in the western Atlantic includes both fishery dependent data from as early as the late 1800s, and nesting data that in some areas goes back to the 1950s (although records from most areas comes from the 1970s and later; NMFS and USFWS 2007b). Another species which has been showing an increasing trend in population abundance in the western Atlantic is the Kemp's ridley sea turtle. Major nesting beaches occur primarily in Mexico, with records on nesting individuals going back to the 1940s, although more systematic monitoring occurred in the 1960s and has continued to the present (NMFS and USFWS 2007c). On most western Atlantic nesting beaches, leatherback sea turtle trends have been increasing, although some beaches in the western Caribbean are showing a decline. Nesting data has been collected as early as the 1960s for Guyana, but most surveys did not start until the 1970s to 1980s (NMFS and USFWS 2007d).

Loggerhead sea turtle populations in the western Atlantic have been showing decline since 1998 based on nesting data (Witherington et al. 2009). Nesting data for most beaches has been collected since the late 1980s and early 1990s (NMFS and USFWS 2007e). Modeling exercises by Conant et al. (2009) led them to conclude the Northwest Atlantic Ocean loggerhead sea turtle DPS is currently at risk of extinction.

Grouper and Tilefish

The first stock assessment of gag was conducted in 1994 and then again in 1997, 2001, and 2006. The most recent assessment was completed in 2006 with an update in 2009 through the SEDAR process. The assessment showed trends in biomass, fishing mortality, fish weight, and fish length dating to the earliest periods of data collection. For this assessment, reliable commercial landings data were estimated back to 1963; however, grouper were not identified by species until 1986. Recreational data were available since 1981. Within this timeframe, gag have not been considered overfished, but some previous assessments indicated gag may have been undergoing overfishing. However, the recent stock assessment update (SEDAR 2009b) suggests the stock is undergoing overfishing and is overfished.

The first stock assessment of red grouper was conducted in 1991 and then again in 1993, 1999, 2002, and 2007. The most recent assessment was completed in 2007 with an update in 2009 through the SEDAR process (SEDAR 2009a). The assessment showed trends in biomass, fishing mortality, fish weight, and fish length dating to the earliest periods of data collection. For this assessment, reliable commercial and recreational landings data were estimated back to 1981. Within this timeframe, the assessment between 1999 and 2002 indicated this stock has been undergoing overfishing and was overfished. The most recent assessment has shown this stock has now recovered to B_{MSY}. However, a recent assessment update may require current harvest targets to be reduced (SEDAR 2009a).

For the deepwater fishery, no stock assessment has been conducted for tilefish. Commercial landings from the Gulf have been reported since 1958, and recreational landings are available back to 1986. A stock assessment for yellowedge grouper was completed in 2002; however, the status of the yellowedge grouper stock remains essentially undetermined. Commercial and recreational data specific to yellowedge grouper are available from 1986 and 1981, respectively.

The commercial grouper and tilefish components of the commercial reef fish fishery in the Gulf are composed of vessels using different gear types and catching a variety of species. A license limitation program is in effect in the commercial reef fish fishery and the harvest of commercial quantities of reef fish requires a valid reef fish permit on board the vessel. Commercial reef fish permits are renewable every year, with a grace period of one year to renew the permit. Non-renewal of a permit during this grace period results in permanent loss of the permit. On November 24, 2008, there were 884 active permits and 196 renewable permits, or a total of 1,080 permits. In terms of landings, longlines have dominated the grouper and tilefish components of the reef fish fishery. Handlines have been the dominant gear used to target gag. Except for fish traps, all the other gear types have historically accounted for relatively small amounts of grouper and tilefish landings. In addition, trap catches were only substantial for the SWG component of the fishery. There are approximately 159 Gulf reef fish dealers with active permits. Because the reef fish dealer permitting system in the Gulf is an open access program, the number of dealers can vary from year to year. For the period 2004-2007, these dealers handled an average of 10.8 MP of grouper and tilefish valued at $25.4 million. These dealer transactions were distributed as follows: Florida, 10 MP worth $23.5 million; Alabama and Mississippi, 102,000 pounds worth $222,000; Louisiana, 270,000 pounds worth $592,000; and Texas, 434,000 pounds worth $1.03 million. The rest of the transactions were handled by dealers outside of the Gulf states. The primary fishing communities involved are located along Florida's west-central coast. Others to the north and south of this area are also affected but not to the same degree. Several communities are highly reliant upon the SWG component of the fishery and especially longline gear used in that fishery.

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities. Cause-and–effect relationships are presented in Tables 6.5.1 and 6.5.2.

Table 6.5.1. The cause and effect relationship of fishing and regulatory actions for hardshell sea turtles within the time period of the CEA.

Time periods	Cause	Observed and/or expected effects
1900 -1970	Habitat destruction, harvest, and fisheries bycatch	Declines in number of nesting female sea turtles
1970-1978	Listing of sea turtles under ESA; awareness of problem; nesting site protections	Provide environment for some sea turtle populations to begin to recover
1989-2000	Require TEDs on shrimp trawls; outreach and education	Decrease neritic juvenile mortality
2001-2008	Sea turtle handling and resuscitation techniques detailed; hook, bycatch release gear, protocol requirements; large gillnet restrictions; revised TEDs for shrimp fishery; requirement for placement of observers	For most sea turtle species, populations show increasing trends; reduction in bycatch mortality

Table 6.5.2. The cause and effect relationship of fishing and regulatory actions for grouper within the time period of the CEA.

Time periods	Cause	Observed and/or expected effects
1986 -1989	Growth and recruitment overfishing	Declines in mean size and weight
1990	Minimum size limits gag red, Nassau, yellowfin, and black grouper; Goliath grouper harvest moratorium; 5-aggregate grouper bag limit; 9.2 mp SWG quota; 1.8 mp DWG quota	Slight increase in commercial landings; decline in recreational landings
1999	Increase gag size limits; 1-fish per vessel warsaw grouper and speckled hind; 1 month commercial seasonal closure	Slight increase in both commercial and recreational landings
2004-2005	Commercial trip limit; decrease in recreational aggregate bag limit; 1-fish red grouper bag limit; 0.44 mp tilefish quota	Slight decrease in commercial landings as quota filled and SWG component of the fishery closed; significant declines in recreational landings; overfishing occurring

9. Determine the magnitude and significance of cumulative effects.

The objectives of this amendment and associated EIS are to reduce the number of hardshell sea turtle takes by the bottom longline component of the reef fish fishery. Actions being considered include: 1) Modifying baits; 2) area, season, and depth restrictions; 3) reducing effort through a longline endorsement program; 4) modifying fishing practices and gear; and 5) modifying framework procedures. Discussions of the short- and long-term direct and indirect effects of each these actions are provided in Sections 6.1 through 6.5.

To examine the magnitude and significance of the cumulative effects, important valued environmental components (VECs) were identified for the overall action to be taken with this amendment. VECs are "any part of the environment that is considered important by the proponent, public, scientists and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern" (EIP 1998). For purposes of this analysis, an initial 23 potential VECs were identified, and the consequences of each alternative proposed in this amendment on each VEC were evaluated. Some of these VECs were combined into a revised VEC because many of the past, current, and reasonably foreseeable future actions (RFFA) were similar. Based on this analysis, seven VECs were determined to be the most important for further consideration. These are shown in Table 6.5.3.

VECs not included for further analysis included consumers and anglers. Consumers were eliminated from further analysis because of the high level of imported reef fish. Possible effects from reductions in domestic production would likely be offset by increased imports. Therefore, consumers would likely not be substantially affected by a reduction in domestic products. Anglers were eliminated from further analyses in this section because the reductions needed in hardshell sea turtle takes applies only to the bottom longline component of the reef fish fishery. Currently, both recreational and commercial harvests of major reef fish species are controlled by quotas, so anglers would still be limited in the fish they can harvest even if the commercial sector does not harvest its quota.

Table 6.5.3. Evaluated VECs considered for further analysis, consolidated VECs and VECs not considered for further analysis. VECs consolidated with other VECs are identified with the VEC number in the first column.

VECs considered for further evaluation	VECs consolidated for further evaluation
Habitat - Hard bottom - EFH	
Protected species - Sea turtles	
Managed resources - Shallow-water grouper - Deepwater grouper - Tilefish - Other species	Gag Red grouper Other SWG Deepwater grouper and tilefish Other reef fish Sharks
Commercial Harvester - Owner - Operator - Crew	
Dealers	
Fishing Communities - Infrastructure - Crew	
Administration	Federal rulemaking Federal enforcement Federal education State rulemaking/framework State education

The following discussion refers to the effects of past, present, and RFFAs on the various VECs. These effects are summarized in Table 6.5.4.

Habitat

EFH, as defined in the GMFMC (2004a) for the Reef Fish FMP consists of all Gulf estuaries; Gulf waters and substrates extending from the US/Mexico border to the boundary between the areas covered by the Gulf and South Atlantic Councils from estuarine waters out to depths of 100 fathoms. In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. A planktonic larval stage lives in the water column and feeds on zooplankton and phytoplankton (GMFMC 2004a). Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf (<100m) which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. However, several species are found over sand and soft-bottom substrates. For example, juvenile red snapper are common on mud-bottoms in the northern Gulf, particularly off Texas through Alabama. Also, some juvenile snapper (e.g., mutton, gray, red, dog, lane, and yellowtail snappers) and grouper (e.g., Goliath grouper, red, gag, and yellowfin groupers) have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems.

Sections 3.1 and 3.2 as well as GMFMC (2004a) describe the physical environment inhabited by groupers and tilefish. Groupers and tilefish are carnivorous bottom dwellers, generally associated (as adults) with hard-bottomed substrates, and rocky reefs. Eggs and larvae for all species are pelagic. Depending on the species, juveniles either share the same habitat as adults, or are found in different habitats and undergo an ontogenetic shift as they mature. For example, red grouper juveniles are found in nearshore waters until they reach approximately 16 inches and move offshore (GMFMC 2004a). Adults are associated with rocky outcrops, wrecks, reefs, ledges, crevices, caverns, as well as "live bottom" areas, in depths of 3 to 190 m. Juvenile gag are estuarine dependent and are found in seagrass beds (GMFMC 2004a). Adult gag are associated with hard-bottom substrates, including offshore reefs and wrecks, coral and live bottoms, and depressions and ledges. Spawning adults form aggregations in depths of 50 to 120 m, with the densest aggregations occurring around the Big Bend area of Florida. Females undergo a migration from shallower waters to the deeper waters where spawning occurs, while males generally stay at the same depths where spawning occurs (Koenig 1999).

Fishing does interact with EFH of sea turtle and reef fish species. The most sensitive gear/habitat interactions include: fish otter trawls, shrimp otter trawls, roller frame trawls, and pair trawls over coral reefs; crab scrapes over coral reefs; oyster dredges over submerged aquatic vegetation (SAV), oyster reefs, or coral reefs; rakes over coral reefs; and patent tongs over SAV, oyster reefs, or coral reefs (GMFMC 2004a). Some of these gear/habitat interactions are unlikely to occur in actual practice (e.g., shrimp trawls towed through hard-bottom areas can destroy shrimp nets and so are avoided). In general, gears that are actively fished by towing have the highest potential to alter habitats. However, some habitats, such as coral reefs and hard-bottoms are sensitive to interactions with passive gears (e.g., traps) as well. Most directed reef fish fishing activities, as described in Section 6.2.1 and 6.4.1, use longlines, vertical lines, fish traps, and spearfishing gear. These have low levels of impacts compared to many other gears.

In the past, some fishing practices have had detrimental effects on the physical environment. Gears such as roller trawls and fish traps damaged habitats while harvesting fish species. As a result of these effects, the Council identified stressed areas and prohibited some gears within the areas to reduce these impacts. Further protections have been developed, primarily by either prohibiting fishing or limiting fishing activities that can occur within certain areas. These are summarized in Section 3.1 and displayed in Figure 3.1.1. More recently, generic EFH Amendment 3 was implemented in 2006. The rule associated with this amendment prohibited bottom anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots to protect coral reefs in several HAPCs, and required a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf EEZ to minimize damage done to habitats should the chain get hung up on natural bottom structures.

Current reef fish management measures likely have minimal impacts on hard-bottom areas. Vertical gear and longlines used in the reef fish fishery can damage habitat through snagging or entanglement. Longlines can also damage hard-bottom structures during retrieval as the line sweeps across the seafloor. Additionally, anchoring over hard-bottom areas can also affect benthic habitat by breaking or destroying bottom structures. However, these gears are not believed to have much negative impact on bottom structures and are considerably less destructive than other commercial gears, such as traps and trawls. Fish traps have been used to harvest reef fish and this gear can cause significant damage to corals and other epibenthic organisms. However, this gear was prohibited from use in the fishery in February 2007.

Damage caused from reef fish fishing, while minor, is associated with the level of fishing effort (see Section 6.2.1). Therefore, actions reducing levels of effort would result in greater benefits to the physical environment because fishing related interactions with habitat would be reduced. Thus, actions described in steps 3 and 4 of this CEA such as Amendments 22, 27/14 (red snapper), 23 (vermilion snapper), 30A (greater amberjack and gray triggerfish), 30B (grouper), Secretarial Amendment 1 (red grouper) and Secretarial Amendment 2 (greater amberjack), which have reduced fishing effort for some species, and possibly the fishery on the whole, are likely to have had a positive effect on hard-bottom habitats. The RFFAs, such as subsequent Amendment 29 rulemaking and the development of ACLs and AMs should also benefit these habitats as they would also reduce or limit fishing effort. Some actions in this amendment (Actions 2 and 3) would have positive affects as they would decrease effort through consolidation.

Reef fish EFH, particularly coral reefs and SAVs, are particularly susceptible to non-fishing activities (GMFMC 2004a). The greatest threat comes from dredge-and-fill activities (ship channels, waterways, canals, and coastal development). Oil and gas activities, as well as changes in freshwater inflows, can also adversely affect these habitats. EFH and HAPC designations described in Section 3.1 are intended to promote careful review of proposed activities that may affect these important habitats to assure that the minimum practicable adverse impacts occur on EFH. However, NMFS has no direct control over final decisions on such projects. The cumulative effects of these alternatives depend on decisions made by other agencies because NMFS and the Council have only a consultative role in non-fishing activities. Decisions made by other agencies that permit destruction of EFH in a manner that does not allow recovery, such as bulkheads on former mangrove or marine vegetated habitats, would constitute irreversible commitments. However, irreversible commitments should occur less frequently as a result of EFH and HAPC designations. Accidental or inadvertent activities such as ship groundings on coral reefs or propeller scars on seagrass could also cause irreversible loss.

In general, sea turtles utilize three habitat zones in their life cycle. Females deposit eggs on sandy beaches where the young hatch. The young, once reaching marine waters, adopt a pelagic life style where they feed on a variety of pelagic prey types. Larger juveniles and adults, depending on the species, have specific foraging grounds. The loggerhead sea turtle, the species primarily taken by longline gear in the eastern Gulf, forages in the same hard-bottom habitat as many reef fish species.

As documented in Step 4c, sea turtles lay their eggs on sandy beaches. As documented in Step 4c, sea turtles can be affected by natural factors such as storm surges on beaches from hurricanes which can affect egg and hatchling survival. Anthropogenic factors include: beach erosion, beach armoring and nourishment, artificial lighting, beach cleaning, increased human presence, recreational beach equipment, beach driving, coastal construction and fishing piers, exotic dune and beach vegetation, and poaching. In addition, secondary threats from human activities from native and introduced species occur in the form of egg predation. Global warming may also affect hatching success and sea turtle demographics.

Protected Resources

Some protected resources are not susceptible to the reef fish fishery (e.g., whales); however, sea turtles and smalltooth sawfish are incidentally caught by reef fish gear and are documented in NMFS (2005). For sea turtles, the complexity of their life history leaves them susceptible to many natural and human impacts, including impacts while they are on land, in the benthic environment, and in the pelagic environment. These are summarized in Step 4c. Sea turtles in the pelagic environment, particularly loggerhead sea turtles, are exposed to a series of longline fisheries. These include the Atlantic highly migratory species pelagic longline fisheries, an Azorean longline fleet, a Spanish longline fleet, and various longline fleets in the Mediterranean Sea (Aguilar et al. 1995, Bolten et al. 1994, Crouse 1999). Loggerhead sea turtles in the benthic environment in waters off the coastal U.S. are exposed to a suite of fisheries in federal and state waters including trawl, purse seine, hook and line, gillnet, pound net, longline, and trap fisheries. Past actions to protect loggerhead sea turtles include TEDs in shrimp trawls (FMP for the Shrimp Fishery of the Gulf), the requirement of turtle-release gear on federally permitted reef fish vessels (Amendment 18A), and circle hook and dehooker requirements for reef fish fishing (Amendment 27/14). The Council is currently working on this amendment to reduce interactions with loggerhead sea turtles and reef fish bottom longline gear that can sometimes be fatal to loggerhead and other hardshell sea turtles.

Managed Resources

There are 42 species of reef fish managed in the Gulf EEZ, and of the species where the stock status is known, four of seven are undergoing overfishing (red snapper, gag, gray triggerfish and greater amberjack) and three of those four are considered overfished (gag, greater amberjack and red snapper; see Section 3.2). Recent assessments for gray triggerfish and gag (SEDAR 9 2006b and SEDAR 10 2006, respectively) suggest these two species are experiencing overfishing, and stock recovery for greater amberjack is occurring slower than anticipated. The recent gag assessment update also indicates this species is overfished (SEDAR 2009b).

In the past, the lack of management of reef fish has allowed many stocks to undergo both growth and recruitment overfishing. This has allowed some stocks to decline as indicated in numerous stock assessments (Section 3.2). For grouper that are targeted by the eastern Gulf bottom longline component of the reef fish fishery, management measures including a minimum size limit, a commercial quota, and an aggregate bag limit were implemented in 1990 (Section 1.3). None of these measures halted increases in landings. An increase in the minimum size limit and a one month commercial closure put in place in 1999 also did not end the increase in grouper landings. During this time period, red grouper became overfished and gag came close to being overfished.

Present management measures put in place primarily for red grouper through Secretarial Amendment 1, 2005 emergency and interim rules, and 2005 regulatory amendments have allowed red grouper to rebuild and no longer be considered overfished, just as these measures were designed to do. However, these measures did not limit the gag harvest enough to prevent overfishing from occurring nor prevent this species from becoming overfished. In fact, these measures, along with actions from Reef Fish Amendments 22, 27/14 (red snapper), 23 (vermilion snapper)[12], Secretarial Amendment 1 (red grouper, DWG, and tilefish) and Secretarial Amendment 2 (greater amberjack), may have redirected effort towards other reef fish species such as gag. Rulemaking from Reef Fish Amendment 30B should provide reductions in gag harvest, however, measures put in place through Amendment 32 are needed to protect this species from overharvest and rebuild the stock as a result of a recent stock assessment update (SEDAR 2009b). Amendment 30B was designed to end overfishing of gag, manage SWG commercial and recreational harvests consistent with TAC, and require compliance with federal fishery management regulations by federally permitted reef fish vessels when fishing in state waters.

Fishery management RFFAs are expected to benefit managed species. The purpose of this amendment is to reduce hardshell sea turtle take by the eastern Gulf bottom longline component of the reef fish fishery. If actions from this amendment reduce overall fishing effort, then stocks susceptible to longline gear such as red grouper may benefit. Other actions are expected to be taken by the Council that would likely be beneficial to the stock and are described in steps 3 and 4 of this CEA. As a result of the reauthorized MSFCMA, ACLs and AMs are to be applied to manage stocks. Amendment 29 proposes to rationalize effort and reduce overcapacity in the commercial grouper and tilefish fisheries in order to achieve and maintain OY in this multi-species fishery. This amendment has developed a grouper and tilefish IFQ program for the commercial sector. IFQ programs have been shown to reduce bycatch and discard mortality in fisheries because fishermen have options in terms of when and where to fish. Additionally, commercial quotas are better regulated under these programs. Other measures are intended to develop triggers for action to be taken immediately should a stock appear to be approaching an overfishing condition. These triggers for action are being developed by the Council for implementation through a generic ACL and AM amendment. The ACLs and AMs have already been developed for greater amberjack, gray triggerfish, red grouper, and gag in Amendments 30A and 30B.

Non-fishing activities are likely to adversely affect reef fish stocks. LNG facilities are being proposed in the western and northern Gulf. As described in Step 4c, these facilities can have a negative effect on species with pelagic larvae, like most reef fish species. To mitigate the effects of these facilities closed rather than open loop systems are being called for. At this time, the affect of LNG facilities is unknown and is likely to be less for reef fish species than other more coastal species such as red drum. Climate change is another factor which could have a detrimental effect on reef fish species. However, what these effects might be cannot be quantified at this time.

Commercial Harvesters (Vessel owner, Captain, and Crew)

Adverse or beneficial effects of actions on vessel owners, captains, and crew are tied to the ability of a vessel to make money. While not an all-inclusive measure, in commercial sectors, the effects of an action are usually measured in terms of the change in the net value of the fishery, defined as the difference between ex-vessel revenues for the fish sold and some measure of the costs associated with their harvest. Because this amendment is designed to

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[12] Note a 2007 regulatory amendment rescinded management measures in Amendment 23, reducing the effect of this amendment on other reef fish stocks.

reduce hardshell sea turtle take by the reef fish bottom longline component, owners and operators of vessels using this gear would be particularly affected.

Because harvest of these species was unhindered by regulations prior to 1990, many vessels were able to enter the fishery. For red grouper, the primary grouper species landed by the fishery, landings averaged at 6.2 mp from 1986-1989, 4.8 mp from 1990-1998, and 5.7 mp from 1999-2005. Gag, the second most commercially harvested species, landings have averaged approximately 1.5 mp from 1963 to 1997, and increased from 1998-2004 to an annual average of 2.7 mp. The DWG and tilefish landings have remained fairly constant and averaged 1.17 mp and 0.52 mp, respectively, from 1993-2006. To constrain harvest so as not to overexploit reef fish in general and grouper specifically, the Council implemented minimum size limits, quotas, seasonal closures, and a permit moratorium. These measures have met with limited success. NMFS implemented a tilefish quota in 2004 via Secretarial Amendment 1.

Current management measures have had a negative, short-term impact on the commercial sector of the fishery. Landing restrictions were needed to keep the commercial red grouper harvest within its quota. This forced closures in the commercial SWG component of the fishery in 2004 and 2005 to prevent the exceeding the red grouper quota. This kept many commercial vessels from taking more fishing trips during these years. As a result, a trip limit was instituted in 2005 in an attempt to lengthen the commercial season. For 2006 through 2008, the fishery did not exceed its quota. For the DWG and tilefish fishing efforts, their respective quotas have been reached generally during the summer months since 2004.

Further compounding the negative effects on the fishery are imports. Imports can cause fishermen to lose markets during and after fishery closures as dealers and processors use imports to meet demand, and limit the price fishermen receive for their products through competitive pricing of imports. Other factors which have had an adverse effect on the commercial sector include increases in fishing costs and hurricanes, which may have pushed marginal fishing operations out of business (see step 4c).

Many RFFAs are likely to have a short-term negative impact on the commercial sector. Red snapper (Amendment 27/14), gray triggerfish, and greater amberjack (Amendment 30A) have been experiencing overfishing. Measures required to end this condition and rebuild stocks have constrained the harvest for these species and are likely to increase competition within the fishery to harvest other stocks. Some short-term beneficial actions include an increase in TAC and relaxation of management measures for red grouper (Amendment 30B) and vermilion snapper (regulatory amendment) because these stocks have been rebuilt. For sea turtle take reduction, any costs associated with the proposed measures in this amendment would need to be evaluated by the owner or operator relative to the net returns from a fishing trip. If the net return is close to or less than the cost of adhering to these new measures, then the profitability of fishing with longline gear is questionable. It is likely the vessel would either not be used to fish for reef fish, or convert to another gear type, such as vertical line gear.

Because many management RFFAs are designed to manage stocks at OY (e.g., Amendment 27/14, 30A, and 30B), these actions should have long-term benefits for the commercial sector. Stocks would be harvested at a sustainable level, and at higher levels for those stocks being rebuilt. The grouper and tilefish IFQ program in Amendment 29 would allow individual fishermen to fish their shares when and where they want. As a result, fish prices are expected to increase as observed in other IFQ programs (GMFMC 2009). Some RFFAs may have negative consequences. An amendment to develop ACLs and AMs for reef fish stocks would likely require the Council to adopt more conservative harvest levels than currently in place. Additionally, negative consequences for the fishery could result through measures put in place through Amendment 32 to end gag overfishing and rebuild the stock. Other measures being developed, but whose effects are unclear at this time, include addressing allocation between the commercial and recreational reef fish fisheries, and an FMP to allow the development of offshore aquaculture in the Gulf. Depending on the allocations selected, the share of some stocks to the commercial sector may increase or decrease. As previously stated, non-management related RFFAs which could affect the commercial sector include hurricanes and increases in fishing costs. Hurricanes are unpredictable and localized in their effects. Increases in fishing costs, unless accompanied by a similar increase in price per pound of fish, are likely to decrease the profitability of fishing operations.

Dealers
Reef fish vessels and dealers are primarily located in Gulf states (step 2). Approximately 159 dealers are estimated to possess permits to buy and sell reef fish species (see Section 3.3.1). More than half of all reef fish dealers are involved in buying and selling grouper. These dealers may hold multiple types of permits. Average employment information per reef fish dealer is not known. Although dealers and processors are not synonymous entities, Keithly and Martin (1997) reported both part- and full-time employment for reef fish processors in the Southeast at approximately 700 individuals. It is assumed that all processors must be dealers, yet a dealer need not be a processor. The profit profile for dealers or processors is not known.

Measures constraining commercial landings both in the past, present, and RFFA may or may not have had negative effects on dealers. As described in step 4c, the amount of reef fish imports has doubled between 1994 and 2005. In terms of pounds, 2005 imports (49.7 mp) were more than twice domestic annual Gulf grouper landings (average 18.4 mp). This means dealers have the ability to substitute domestic product with imports. In addition, dealers also have the ability to substitute other domestic seafood products for grouper in order to satisfy public demand for seafood. Therefore, the negative effects from management actions for the fishery may not necessarily translate into negative effects for dealers. However, if dealers were to make the transition to handling more imports, the necessity of a dockside facility may have reduced importance as there is less need for docking facilities as fish are transported by other means. If dealers decide to move further inland to be near major transportation arteries, there could be negative consequences for vessels and operators who remain and require docking facilities. In addition, the fishing community may suffer the loss of employment opportunities and other amenities that accrue from having a working waterfront. As domestic fish stocks are rebuilt and management programs such as IFQs are instituted, a more stable supply of domestic reef fish should be available to dealers. This should improve their ability to market these products and increase profits.

Fishing Communities
A fishing community includes the infrastructure, which refers to fishing related businesses and includes marinas, rentals, snorkel and dive shops, boat dockage and repair facilities, tackle and bait shops, fish houses, and lodgings related to the recreational industry. This infrastructure is tied to the commercial and recreational sectors and can be affected by adverse and beneficial economic conditions in those fisheries. Therefore, the effects of past, present, and RFFAs

should reflect responses by the fisheries to these actions. Past actions allowing the recreational and commercial sectors to expand have had a beneficial effect providing business opportunities to service the need of these industries. Recent actions which have constrained the commercial sectors likely have had a negative effect on fishing communities as lower revenues resonate through the communities to support the infrastructure. This would be particularly true for those communities that depend on the eastern Gulf bottom longline component for revenues and employment. However, as conditions improve for the reef fish fishery as a whole, as described above through RFFAs to improve the conditions of managed species, similar benefits should be accrued by the infrastructure.

Administration

Administration of fisheries is conducted through federal (including the Council) and state agencies which develop and enforce regulations, collect data on various fishing entities, and assess the health of various stocks. As more regulations are required to constrain stock exploitation to sustainable levels, greater administration of the resource is needed. The NMFS Office for Law Enforcement, in cooperation with state agencies, would continue to monitor regulatory compliance with existing regulations and NMFS would continue to monitor sea turtle takes to determine if they are consistent with levels authorized in the ITS.

Table 6.5.4. The effects of past, present, and reasonably foreseeable future actions on VECs identified in Table 6.5.3.

VECs	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, and Future Actions
Habitat - hard bottom - EFH	**Negative** - combined effects of disturbance by fishing gear and non-fishing actions reduce habitat quality.	**Somewhat less negative** - combined effects of disturbance by fishing gear reduced, but still occurring so habitat quality still reduced.	**Positive, but minor** - some reduction in effort should lead to reduced disturbance from fishing actions.	**Positive** - stabilizing effort should lead to reduced disturbance from fishing actions.
Protected resources -Sea turtles	**Negative** – combined effects from fishing activities and other anthropogenic sources directly caused populations to be reduced.	**Positive** - for most sea turtle species, populations have increased due to regulation and habitat protection; **Negative** – Loggerhead populations have declined.	**Positive** – greater protection for sea turtles from fishing activities. **Negative** – protections from bottom longline may not be only source of mortality inhibiting population increase.	**Positive** – greater protection for sea turtles from fishing activities. **Negative** – protections from bottom longline may not be only source of mortality inhibiting population increase.
Managed resources - Shallow-water grouper - Deepwater grouper - Tilefish - Other species	**Negative** - for some stocks, allowed to become overfished; bycatch mortality from directed fishing for other species.	**Positive** - overfished stocks under rebuilding plans, F reduced on stocks undergoing overfishing (e.g., red grouper). **Negative** - overfishing is occurring on some stocks (e.g., gag); bycatch mortality from directed fishing for other species.	**Negative, short term** - if effort reduction for grouper, possible shifting toward other reef fish species. **Positive, long term** - As grouper stocks improve, less effort shifting toward other managed reef fish species.	**Negative, short term** - potential increased harvesting due to effort shifting, possible bycatch mortality. **Positive long term** - as stocks increase, effort redirected back towards those stocks, less bycatch.
Commercial Harvester - Owner - Operator	**Positive** - fishery has supported profitable vessels.	**Negative** - lower catch per unit effort/effort results in increased	**Negative, short term** - reducing harvests reduces profits. **Positive,**	**Negative, short term** - reducing harvests reduces profits. **Positive,**

VECs	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, and Future Actions
- Crew		fishing cost and reduces profits.	**long term** - as harvests are allowed to approach OY, profits increase and the fishery consolidates.	**long term** - as harvests are allowed to approach OY, profits increase and fishery consolidates.
Dealers	**Positive** - fishery has supported profitable landings.	**Positive or negative** – some dealers can replace domestic harvest with imports or substitutes. Others cannot.	**Positive or negative, short term** – dependent on ability to replace domestic harvest with imports or substitutes. **Positive, long term** - as harvests managed at OY, stable market.	**Positive or negative, short term** – dependent on ability to replace domestic harvest with imports or substitutes. **Positive, long term** - as harvests managed at OY, stable market.
Fishing Communities - Infrastructure - Crew	**Positive** - fishery has supported profitable fishing operations which have supported an increase in infrastructure. Recreational sector participation expands.	**Negative** – contraction of fishing operations resulting in fewer dollars available to support infrastructure.	**Negative, short term** - contraction of fishing operations resulting in fewer dollars available to support infrastructure. Recreational sector participation declines. **Positive, long term** - as harvests are allowed to approach OY, fishery expands allowing more money to support infrastructure.	**Negative, short term** - contraction of fishing operations resulting in fewer dollars available to support infrastructure. Recreational sector participation declines. **Positive, long term** - as harvests are allowed to approach OY, fishery expands allowing more money to support infrastructure.

VECs	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, and Future Actions
Administration	**Positive** - fewer regulations minimized administrative and enforcement requirements.	**Negative** - overfishing of stocks requires increased regulations and enforcement costs.	**Negative, short term** – establish bureaucracy to identify and manage fishery participants, monitor landings. **Positive, long term** – commercial sector driven management enhance monitoring and enforcement.	**Negative, short term** - overfishing of stocks requires increased regulations and enforcement costs. **Positive, long term** – commercial sector driven management enhance monitoring and enforcement.

10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.

The cumulative effects of reducing the number of sea turtle takes by the longline component of the eastern Gulf reef fish fishery on the biophysical and socioeconomic environments are positive since they will ultimately help restore/maintain sea turtles populations at a level that will protect these species under the ESA. However, short-term negative impacts on the socioeconomic environment may occur to the bottom longline component of the reef fish fishery due to the need to limit fishing activities to reduce sea turtle bycatch. These negative impacts can be minimized for the commercial sector by utilizing a combination of the actions evaluated in this amendment. Additionally, research may be able to find a way to reduce interactions between hardshell sea turtles and reef fish bottom longline gear. However, due to the magnitude sea turtle take has been exceeded by this sector of the fishery, these negative impacts may continue over the long term.

11. Monitor the cumulative effects of the selected alternative and modify management as necessary.

The effects of the proposed actions are, and will continue to be, monitored through collection of fisheries data by NMFS, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. Commercial data is collected through trip ticket programs, port samplers, observers, and logbook programs. The TEWG continues to meet and assess sea turtle populations.

6.6 Unavoidable Adverse Effects

The process of protecting threatened loggerhead sea turtles by reducing hardshell sea turtle bycatch and bycatch mortality in the reef fish bottom longline fishery through Amendment 31 is expected to have a negative short-term effect on the social and economic environment, and will create a burden on the administrative environment. No alternatives are being considered that would avoid these negative effects because they are a necessary cost associated with protecting sea turtles. The range of alternatives has varying degrees of economic costs and administrative burdens. Some alternatives have relatively small short-term economic costs and administrative burdens, but would also provide smaller and more delayed long-term benefits. Other alternatives have greater short-term costs, but provide larger long-term benefits. Therefore, it is difficult to mitigate these measures and managers must balance the costs and benefits when choosing management alternatives for the reef fish fishery.

To ensure sea turtle take is reduced, periodic monitoring of the reef fish fishery is needed to estimate the number of sea turtle interactions with the fishing gear. This monitoring is designed to incorporate new information and to address unanticipated developments in the respective fisheries and would be used to make appropriate adjustments in the reef fish regulations should fishery practices not achieve needed take reductions. Data collected for these reviews come from logbooks and observer programs funded by NMFS. Additionally, NMFS and other government agencies support research on these species by federal, state, academic, and private research entities.

Depending on the outcome of these reviews, the Council may determine further management action should be taken. What type of rule making vehicle NMFS or the Council determines is needed is difficult to predict. Actions would be dictated by the severity of takes and by the time frame needed to implement a regulatory change. The Council has three options for implementing these measures. The first is to amend the Reef Fish FMP to include new information and management actions. Recent plan amendments put forth by the Council have taken between two and three years from conception to implementation. NMFS may take other management actions through emergency or an interim measures. Emergency actions and interim measures only remain in effect for 180 days after the date of publication of the rule and may be extended by publication in the *Federal Register* for one additional period of not more than 186 days provided the public has had an opportunity to comment on the emergency actions and interim measures. The MSFCMA further states that when a Council requests that an emergency action and interim measure be taken, the Council should also be actively preparing plan amendments or regulations that address the emergency on a permanent basis.

Current reef fish regulations are labor intensive for law enforcement officials. NMFS law enforcement officials work cooperatively with other federal and state agencies to keep illegal activity to a minimum. Violators are penalized, and for reef fish commercial and reef fish for-hire operators, permits required to operate in their respective fisheries can be sanctioned.

Reef fish management measures include a number of area-specific regulations where reef fish fishing is restricted or prohibited in order to protect habitat or spawning aggregations of fish, or to reduce fishing pressure in areas that are heavily fished. Additionally, Amendment 30B includes alternative to create a new marine reserve. To improve enforceability of these areas and those being evaluated in this amendment, the Council has established a VMS program for the commercial reef fish fishery to improve enforcement. The VMS allows NMFS enforcement personnel to monitor compliance with these area-specific regulations, and track and prosecute violations.

6.7 Relationship Between Short-term Uses and Long-term Productivity

Sea turtle takes must be reduced to satisfy the requirements of the MSFCMA and ESA. As a result, many of the current participants in the bottom longline component of the reef fish fishery may never recuperate losses incurred from the more restrictive management actions imposed in the short-term. The NMFS has developed an emergency rule to reduce takes for 2009 by closing the eastern Gulf to reef fish bottom longline fishing within the 50 fathom contour. If the Council can develop long-term measures to reduce takes that have less negative effects from this rule, fewer participants may be negatively affected. Other means to continue in the fishery would be for participants to convert to less harmful gear types (e.g., vertical gear) or participate in other fisheries during times or places when reef fish bottom longline gear is not allowed.

Actions considered in this amendment should not have adverse effects on public health or safety since these measures should not alter actual fishing practices, just where or when activities can occur. Depending on the preferred alternative, longline gear may still be allowed, just limited to the extent it can be used. Unique characteristics of the geographic area are highlighted in Section 3 should season closures be selected. Adverse effects of fishing activities on the physical environment are described in detail in Section 6.1-6.5 of the actions. These sections conclude little impact on the physical environment should occur from the actions proposed in this document. Uncertainty and risk associated with the measures are also described in detail in as well as assumptions underlying the analyses.

6.8 Mitigation, Monitoring, and Enforcement Measures

As mentioned in Section 6.6, the process of managing sea turtle and reef fish populations are expected to have a negative short-term effect on the social and economic environment, and will create a burden on the administrative environment. This is particularly true for measures needed to reduce hardshell sea turtle takes by the reef fish bottom longline component. No alternatives are being considered that would avoid these negative effects because they are a necessary cost associated with protecting sea turtle populations. Therefore, it is difficult to mitigate these measures and managers must balance the costs and benefits when choosing management alternatives for the reef fish fishery.

Sea turtle populations have been assessed by NMFS since 1995 when the SEFSC established the TEWG. This group is a team of population biologists, sea turtle scientists, and life history specialists who are charged with compiling and examining information on the status of sea turtle species. To ensure grouper and tilefish stocks are managed for OY, periodic reviews of stock status are needed. These reviews are designed to incorporate new information and to address unanticipated developments in the respective fisheries and would be used to make appropriate adjustments in the reef fish regulations should harvest not achieve OY objectives. These assessments would be requested as needed by the SEDAR Steering Committee[13]. Reviews of reef fish and sea turtle populations should benefit from updated landings information through state and federal fishery monitoring programs. Additionally, NMFS and other government agencies support research on these species by federal, state, academic, and private research entities.

Actions that the Council could employ to further restrict harvest or reduce bycatch include, but would not be limited to changes in trip limits, gear use, seasonal closures, or area closures. The Council has several options for implementing these measures. The first is to amend the Reef Fish FMP to include new information and management actions. Recent plan amendments put forth by the Council have taken between two and three years from conception to implementation. The second method is a regulatory amendment based on the framework established in Amendments 1 and 4 of the Reef Fish FMP to set TAC. Because this action was developed to address ways to manage the fishery within the TACs established for managed fisheries species, this type of action could not could not be applied if sea turtle take exceeded the fisheries ITS. Recent regulatory amendments have taken between nine months and two years from conception to implementation.

The Council can also request NMFS to take other management actions through emergency or interim measures. Emergency actions and interim measures only remain in effect for 180 days after the date of publication of the rule and may be extended by publication in the *Federal Register* for one additional period of not more than 186 days provided the public has had an opportunity to comment on the emergency actions and interim measures. The MSFCMA further states that when a Council requests that an emergency action and interim measure be taken, the

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[13] It should be noted that these periodic stock assessments are not meant to replace the scheduled review by the Secretary of Commerce of rebuilding plans/regulations of overfished fisheries required under §304(e)(7) of the MSFCMA that is to occur at least every two years to ensure adequate progress toward stock rebuilding and ending overfishing. Additionally, NMFS annually reports on the status of stocks in its Report to Congress.

Council should also be actively preparing plan amendments or regulations that address the emergency on a permanent basis.

What type of rule making vehicle the NMFS or the Council determine is needed is difficult to predict and would be dictated by the severity of overages in sea turtle take as well as the time frame needed to implement a regulatory change. If the overage in takes are small, but would still allow sea turtle populations to recover within the maximum time frame required by NMFS guidance, NMFS could apply possible closures from actions being evaluated in this amendment. Should the overage be severe, the Council could ask for an emergency action or interim rule that would severely restrict or halt sea turtle takes while the Council explores management measures that would bring the takes below levels authorized by the BiOp.

Enforcing reef fish regulations are labor intensive. NMFS law enforcement officials work cooperatively with other federal and state agencies to keep illegal activity to a minimum. Violators are penalized, and for reef fish commercial and reef fish for-hire operators, permits required to operate in their respective fisheries can be sanctioned.

Several reef fish management measures include area-specific regulations (See Sections 3.1 and 6.6). To improve enforceability of these areas and those being evaluated in this amendment, the Council has established a VMS program for the commercial reef fish fishery to improve enforcement of these areas. The VMS allows NMFS enforcement personnel to monitor compliance with these area-specific regulations, and track and prosecute violations.

6.9 Irreversible and Irretrievable Commitments of Resources

There are no irreversible or irretrievable commitments of agency resources proposed herein. The actions reduce sea turtle take by the bottom longline component of the reef fish fishery are readily changeable by the Council in the future. There may be some loss of immediate income (irretrievable in the context of an individual not being able to benefit from compounded value over time) to the reef fish bottom longline component from the fishery restrictions.

6.10 Any Other Disclosures

CEQ guidance on environmental consequences (40 CFR §1502.16) indicates the following elements should be considered for the scientific and analytic basis for comparisons of alternatives. These are:

a) Direct effects and their significance.
b) Indirect effects and their significance.
c) Possible conflicts between the proposed action and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.
d) The environmental effects of alternatives including the proposed action.
e) Energy requirements and conservation potential of various alternatives and mitigation measures.
f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.

g) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.
h) Means to mitigate adverse environmental impacts.

Items a, b, d, e, f, and h are addressed in Sections 2, 3, 4, 5, and 6.1-6.6. Items a, b, and d are directly discussed in Sections 2 and 6. Item e is discussed in economic analyses in Sections 2, 3, 6, and the RIR. Alternatives that encourage fewer fishing trips would result in energy conservation. Item f is discussed throughout the document as fish stocks are a natural and depletable resource. A goal of this amendment is to make reef fish stocks sustainable resources for the nation while minimizing bycatch to the extent practicable. Mitigation measures are discussed in Section 6.10. Item h is discussed in Sections 3 and 6, with particular mention in Section 6.10.

The other elements are not applicable to the actions taken in this document. Because this amendment concerns the management of marine fish stocks, it is not in conflict with the objectives of federal, regional, state, or local land use plans, policies, and controls (Item c). However, it should be noted the goals of this amendment are to rationalize effort and reduce overcapacity in the commercial grouper and tilefish fisheries in order to achieve and maintain OY in this multi-species fishery. These are goals the federal government shares with regional and state management agencies (see Section 4.2 – Administrative environment). Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures (Item g) is not a factor in this amendment. The actions taken in this amendment will affect a marine stock and its fishery, and should not affect land-based, urban environments.

With respect to the ESA, SERO determined at least one of the four conditions requiring reinitiation of the formal consultation specified at 50 CFR 402.16 has been met for the reef fish fishery. Therefore, a reinitiation of a section 7 consultation on the subject fishery was requested in a memorandum dated September 3, 2008. However, the continued authorization of the Gulf reef fish fishery managed under the FMP was determined to not likely to jeopardize the continued existence of any listed species or destroy or adversely modify critical habitat during the consultation period under Section 7(a)(2) of the ESA.

With respect to the MMPA, fishing activities conducted under the Reef Fish FMP should have no adverse impact on marine mammals. The reef fish fishery is prosecuted primarily with longline and hook-and-line gear. These are classified in the 2009 List of Fisheries (73 FR 73032) as Category III fisheries. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to 1% of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population. The proposed actions are not expected to alter existing fishing practices in such a way as to alter the interactions with marine mammals.

Because the proposed actions are directed towards the management of naturally occurring species in the Gulf, the introduction or spread of non-indigenous species should not occur.

7.0 REGULATORY IMPACT REVIEW

7.1 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 impacts that the proposed management alternatives in this amendment to the Reef Fish FMP would be expected to have on the commercial reef fish fishery.

7.2 Problems and Objectives in the Fisheries

The problems and objectives addressed by this proposed amendment are discussed in Section 1.2 of this document and are included herein by reference. In summary, the number of loggerhead sea turtle takes authorized in the 2005 BiOp by the bottom longline component of the reef fish fishery in the Gulf has been exceeded (NMFS 2008). The ESA requires the federal government to protect and conserve species and populations that are endangered, or threatened with extinction, and to conserve the ecosystems on which these species depend, while National Standard 9 under the MSFCMA, requires that conservation and management measures to the extent practicable, minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. Management measures considered in this amendment are intended to reduce hardshell sea turtle interactions by bottom longline component of the Gulf reef fish fishery.

7.4 Description of the Fisheries

A description of the Gulf reef fish fishery is provided in Sections 3.1 and 3.2 of this document and is incorporated herein by reference.

7.5 Impacts of Management Alternatives

Detailed analyses and discussion for all alternatives for each of the management measures considered in this amendment are contained in Section 6.0 and are incorporated herein by reference.

7.5.1 Action 1: Allow or Disallow Squid Bait in the Bottom Longline Component of the Reef Fish Fishery

A detailed analysis of the expected impacts of this action is contained in Section 6.1.3 and is incorporated herein by reference. In addition to the status quo alternative, this action considers restrictions on bait types in the bottom longline component of the reef fish fishery. **Preferred Alternative 1**, the status quo alternative, would not be expected to result in any change in bait type or other behavioral changes in the short term in the bottom longline component of the commercial reef fish fishery. As a result, no short term adverse economic effects would be expected. However, if bait type is an important factor in the interaction between hardshell sea turtles and bottom longline gear, **Preferred Alternative 1** could lead to more restrictive management measures in the future, with accompanying greater adverse economic effects than protective action at this time. **Alternative 2** would prohibit the possession of squid or squid parts on vessels that have reef fish and longline gear aboard. This prohibition would be expected to result in fewer interactions between hardshell sea turtles and bottom longline gear, but could result in adverse economic impacts stemming from increased bait costs, higher labor demands, or possible reductions in catch per unit effort. The magnitude of anticipated reductions in interactions between hardshell sea turtles and bottom longline gear, the economic value associated with these reductions, and the potential adverse economic impacts to the bottom longline component of the commercial reef fish fishery cannot be quantified at this time.

7.5.2 Action 2: Restrict the Use of Bottom Longline Gear for Reef Fish in the Eastern Gulf of Mexico (east of 85^{o}30’ W longitude, near Cape San Blas, Florida)

A detailed analysis of the expected impacts of this action is contained in Section 6.2.3 and is incorporated herein by reference. **Action 2** would limit interactions between bottom longline fishing gear and hardshell sea turtles by placing various restrictions on the use of longline gear in the eastern Gulf including area, depth, and time of the year restrictions. In general, more severe restrictions on the longline fleet, e.g., a longer seasonal prohibition on the use of the gear when bottom fishing or a wider area within which the gear is restricted, would be expected to yield greater reductions in the probability of interactions between longline gear and hardshell sea turtles and would be expected to result in greater reductions in effort and net operating revenues (NOR). Under **Alternative 1** (status quo), changes in economic performance are not expected to occur. Levels of interactions between hardshell sea turtles and bottom longline gear and associated hardshell sea turtle takes are expected to remain high. Furthermore, a delay in the implementation of measures reducing interactions between hardshell sea turtles and longline gear could lead to more restrictive management measures at a later date, resulting in greater adverse economic impacts at that time.

Because each of Alternatives 2-4 dealt with a different aspect of the proposed bottom longline restriction and an option under each alternative was selected as a preferred option, the following discussion presents the range of expected effects of each alternative and options rather than detailed descriptions of the expected effects for each option, followed by a discussion of the combined expected effects of all preferred options.

Alternative 2, which would prohibit bottom longline fishing activities in certain zones, could result in bottom longline effort losses ranging from 411 to 1,238 bottom longline trips under

Option a and **Preferred Option c**, respectively. Corresponding reductions in NOR are estimated to range from $2.9 million to $8.6 million under **Option a** and **Preferred Option c**, respectively. Under **Alternative 3**, reductions in longline effort and NOR would be expected to range from 619 and 905 longline trips and $3.9 million and $6.1 million, respectively.

Alternative 3 would restrict bottom longline fishing activities to specific depths. **Option d,** the most restrictive option, would move the bottom longline fleet to water depths greater than 50 fathoms, and result in an expected loss of bottom longline effort of approximately 1,039 trips. If affected bottom longline effort is not converted into vertical line trips, the NOR for affected vessels would be expected to be reduced by approximately $7.1 million. **Option a** would move the bottom longline fleet to water depths greater than 30 fathoms and would constitute the least restrictive measure under **Alternative 3**. With a conversion of all affected bottom longline trips into vertical line trips, the expected reduction in NOR under **Option a** is estimated to be approximately $1.4 million.

The estimated reductions in bottom longline effort and NOR under **Alternative 4** are estimated to range from 349 and 1,238 longline trips and approximately $2.1 million and $8.6 million, under **Preferred Option a** and Option c, respectively.

As previously stated, for **Alternatives 2-4**, the expected reductions in NOR could be reduced if affected bottom longline trips convert to vertical line gear. Gear conversion expenditures would also be expected to benefit the appropriate suppliers and installers but would represent a substantial new cost to the longline industry. Furthermore, longline operators may have difficulty obtaining adequate loans to cover gear conversion.

Overall, the preferred alternatives and options selected by the Council would prohibit the use of longline gear in the eastern Gulf (**Alternative 2 – Preferred Option c**) in waters less than 35 fathoms deep (**Alternative 3 – Preferred Option b**) between June and August (**Alternative 4 – Preferred Option a**). This set of preferred alternatives and options, if implemented, would be expected to result in the loss of 243 bottom longline trips. Without loss mitigation through gear conversion, the expected reduction in NOR would be expected to be approximately $1.36 million. Gear conversion to reduce these losses would be expected to result in the generation of an estimated 109 to 545 vertical line trips under 20% and 100% gear conversion rates, respectively, and the appropriate reductions in NOR are expected to be approximately $1.2 million and $500,000. In addition to the expected reductions in NOR anticipated under these alternatives, projected reductions in trips would also be expected to result in additional reductions in economic activity associated with trip costs. Not only would NOR be reduced, which represent captain and crew wages and owner profits, but all operating costs for fuel, bait, ice, food, trip-related gear costs, etc., would not be spent, adversely affecting associated industries. Expenditure flows would be expected to partially recover as the rate of gear conversion increases. The aggregate net economic effect of these reductions could be substantial. Employment at multiple levels in the economy could be affected, worsening an already difficult situation due to the current general economic decline.

7.5.3 Action 3: Longline Endorsements to Fish east of Cape San Blas

A detailed analysis of the expected impacts of this action is contained in Section 6.3.3 and is incorporated herein by reference. **Action 3** would establish a permit endorsement to the reef fish permit to allow fishing for reef fish with bottom longline gear in the eastern Gulf of Mexico. **Alternative 1**, the status quo, would not establish a permit endorsement to allow fishing for reef fish with bottom longline gear in the eastern Gulf of Mexico. While not creating a permit endorsement would allow all current vessels that fish for reef fish in this area using bottom longline gear to continue to operate in their current manner and not result in any short term adverse economic effects on these participants, this action, in tandem with other measures considered, may be insufficient to adequately reduce hardshell sea turtle interactions, resulting in more severe management changes, with associated adverse economic effects, than those currently considered. **Alternatives 2-6**, under both **Options a** and **b**, would be expected to result in reductions in total annual net operating revenues for vessels in the bottom longline component of the commercial reef fish fishery. These losses would be expected to be reduced as the rate of gear conversion from bottom longline gear to vertical line gear increases for vessels that would not qualify for an endorsement. For all endorsement thresholds and gear conversion assumptions, the expected reduction in total annual NOR increases if the qualifying years are 1999-2004 compared to 1999-2007; the longer the qualifying period, the lower the total adverse economic affect on the bottom longline component of the fishery. Finally, higher minimum annual average landings thresholds are associated with greater expected adverse economic effects. While **Alternatives 2** and **3** would be expected to result in lower adverse economic effects on fishery participants than the preferred alternative, these alternatives may not support sufficient reductions in interactions between hardshell sea turtles and longline gear. **Preferred Alternative 4 – Preferred Option b** appears to strike a balance between reducing interactions between hardshell sea turtles and longline gear and providing opportunities to maintain a bottom longline sector that would continue to support shore-side businesses and associated infrastructure dependent on the sector in the eastern Gulf. The composition and size distribution of the existing bottom longline component of the commercial reef fish fleet and the limited number of endorsements expected to be issued under the preferred alternative suggest that prohibiting the transfer (**Sub-Option (i)**) of permit endorsements or limiting transfers to vessels of equal or lesser length (**Sub-Option (iii)**) would not be expected to reduce interactions between hardshell sea turtles and longline gear beyond levels expected under the preferred alternative. However, the implementation of **Sub-options (i)** or **(iii)** could result in adverse economic impacts by impeding the development or proper functioning of a market for endorsements. In contrast, **Preferred Sub-option (ii)** is not expected to result in adverse economic impacts because it would allow unrestricted endorsement transfers. **Alternatives 5** and **6** would be expected to significantly curtail bottom longline effort and interactions between hardshell sea turtles and bottom longline gear in the eastern Gulf of Mexico, but the higher landings threshold required to qualify for an endorsement to fish in the eastern Gulf may result in a fleet size that is too limited to sustain shore-side businesses and associated infrastructure dependent on the sector. **Alternative 7** could reduce longline effort and interactions between hardshell sea turtles and bottom longline gear as much as **Alternative 5,** but its implementation may not result in sustained benefits to targeted communities. **Alternative 7** may also raise fairness and equity issues by excluding permit owners who meet the landings requirement but do not live in one of the targeted fishing communities.

7.5.4 Action 4: Modify Fishing Practices and Gear for Vessels using Bottom Longline Gear to Harvest Reef Fish east of Cape San Blas

A detailed analysis of the expected impacts of this action is contained in Section 6.4.3 and is incorporated herein by reference. In addition to a no action alternative (**Alternative 1**), **Action 4** considers a series of restrictions on fishing practices and gear to reduce interactions between hardshell sea turtles and bottom longline gear in the eastern Gulf. **Alternatives 2** and **4** would set maximum allowable mainline and gangion lengths, respectively. **Preferred Alternative 3** would limit the number of hooks per vessel and the number of hooks that are fished or rigged for fishing. Modifying the fishing practices and gear to harvest reef fish using bottom longline gear in the eastern Gulf would be expected to reduce the number of interactions between hardshell sea turtle takes and bottom longline gear are expected; however, the expected net economic effects of these alternatives on fishing vessels cannot be quantitatively determined with available data. It seems probable that vessels might compensate for a hook reduction by increasing the number of sets, or make other fishing changes, diminishing the potential adverse effects of these restrictions on net operating revenues, thereby partially offsetting expected reduction in hardshell sea turtle interactions. It has been argued, however, that effort is unlikely to be increase due to other functional trip limitations on vessels and effort would not increase with hook limitations. Overall, however, the proposed hook limitation would be expected to reduce the catch per unit effort of bottom longline vessels, resulting in an unknown increase in operating costs or decrease in total revenues.

7.5.5 Combined Impacts

In combination, the preferred alternatives for Actions 2 and 3 would be expected to result in a reduction in NOR to affected bottom longline vessels of approximately $1.28 million to $3.44 million under 100% and 0% gear conversion rates, respectively. Assuming 40-60% gear conversion rates can be reasonably, the combined effects of the preferred alternatives for Actions 2 and 3 would be a reduction in NOR to affected bottom longline vessels of approximately $2.14 million (60% gear conversion) to approximately $2.57 million (40% gear conversion). As discussed in Section 7.5.4, additional unquantified adverse economic effects may accrue to the proposed hook restrictions.

As discussed in Section 6.0 and incorporated herein by reference, additional unquantified adverse economic effects would be expected to accrue to shoreside businesses associated with affected vessels. These would be expected to include, but not limited to, changes in gear, bait, and other trip related purchases, changes in product flow, and changes in ex-vessel price. These changes in business activity could be substantial enough in localized situations sufficient to result in business failure for some entities. Uncertainty associated with adaptive behavior by fishermen and associated shoreside businesses, however, particularly given that the proposed actions would not directly affect allowable commercial harvests, precludes meaningful specific forecasts of such events.

Other Gulf species, such as coastal migratory pelagics, or the vessels that target these species, would not be expected to be directly affected by this proposed action. However, these species, the vessels that target them, and associated shoreside businesses, could be indirectly affected if the proposed action results in effort shift to these species, resulting in increased harvest pressure, increased stock stress, and potentially harmful stock effects. All of the more commonly harvested commercial finfish species, however, are subject to either or both limited access permit requirements or quota management. Limited access permit restrictions would be expected to limit increased harvest pressure because entrance into the fishery would require exit by an existing participant (though effort could increase if a latent permit is purchased and actively fished), while quota management limits the total harvest. As a result, for species subject to either permit or quota restrictions, the effects of effort shift by former bottom longline reef fish vessels should largely be limited to distributional effects; the same quantity of harvests of these newly targeted species, and the revenues associated with these harvests, would be expected to be roughly equivalent to historic harvests, just distributed over different vessels. One species, Spanish mackerel, while quota managed, could easily accommodate increased effort because the commercial quota has not been harvested since the Florida net ban in the 1990's. While a change in the distribution of harvests may potentially adversely affect the profitability of current vessels, adverse stock effects, and associated economic effects, should be minimal to non-existent due to quota management. For species not subject to quota restrictions, such as dolphin or bluefish, increased harvest pressure could result in adverse stock effects and associated adverse economic effects. However, the absence of quotas for species not subject to quota management is an indication of the lack of current commercial importance of these species and, as a result, substantive effort shift to these species would not be expected.

7.6 Private and Public Costs

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

Council costs of document preparation,
meetings, public hearings, and information
dissemination……………………………………………………………………..$155,000

NMFS administrative costs of document
preparation, meetings, and review ………………………………………………...$90,000

TOTAL……………………………………………………………………...$245,000

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. To the extent that there are time and area closures proposed in this amendment, additional enforcement activity is anticipated. However, under a fixed budget, any additional enforcement activity due to the adoption of this amendment would mean a redirection of existing resources to enforce the new measures.

7.7 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: (1) An annual effect 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 or obligations of 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 this executive order. Based on the information provided above, this action has been determined to not be economically significant for purposes of E.O. 12866.

8.0 REGULATORY FLEXIBILITY ACT ANALYSIS

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

8.2 Description of reasons why action by the agency is being considered

A discussion of the reasons why action by the agency is being considered is provided in Section 1.2 of this document and is incorporated herein by reference. In summary, the purpose of this proposed rule is to reduce interactions between sea turtles and bottom longline gear in the reef fish fishery in the eastern Gulf of Mexico.

8.3 Statement of the objectives of, and legal basis for, the proposed rule

The objective of this amendment is to reduce interactions between sea turtles and bottom longline gear in the reef fish fishery in the eastern Gulf of Mexico while maintaining the economic viability in this sector of the reef fish fishery. The Magnuson-Stevens Conservation and Management Act provides the statutory basis for this proposed rule.

8.4 Description and estimate of the number of small entities to which the proposed action will apply

This proposed rule, if implemented, would be expected to directly affect commercial fishing vessels that use bottom longline gear to harvest reef fish in the eastern Gulf of Mexico. Based on logbook records, for the period 2003-2007, an average of 149 vessels per year recorded reef fishing landings using bottom longline gear. These vessels are estimated to average $108,635 per year in gross revenues and $72,649 per year in net operating revenues (NOR; revenues net of non-labor trip costs).

Some fleet activity is known to occur in the Gulf of Mexico commercial reef fish fishery. Based on permit data, the maximum number of permits reported to be owned by the same entity is 6, though additional permits may be linked through other affiliations which cannot be identified through current data. It is unknown whether all of these linked permits are for vessels that use bottom longline gear. Nevertheless, assuming each of these 6 vessels use bottom longline gear and using the average revenue per vessel provided above, the average annual combined revenues for this entity would be approximately $652,000.

The Small Business Administration has established size criteria for all major industry sectors in the U.S. including fish harvesters. A business involved in fish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $4.0 million (NAICS code 114111, finfish fishing) for all its affiliated operations worldwide. Based on the average annual gross revenue estimate provided above, all commercial reef fish vessels expected to be directly affected by this proposed rule are determined for the purpose of this analysis to be small business entities.

8.5 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.

The permit endorsement that would be established by this proposed rule, if implemented, would be a new compliance requirement. The endorsement would not require an application or additional fees. Instead, eligibility for the endorsement would be determined by NMFS, based on an evaluation of the landings history associated with each commercial reef fish permit, and the permit endorsement provided to qualified vessels. As a result, no additional costs or administrative burden would be imposed on qualifying entities. Permit holders that do not qualify for the endorsement would be prohibited from using bottom longline gear to harvest reef fish in the prescribed area. The expected economic effects of the endorsement requirement on entities that historically have harvested reef fish with bottom longline gear but would not qualify for the endorsement is discussed below. This proposed rule would not establish any new reporting or record-keeping requirements.

8.6 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.

8.7 Significance of economic impacts on small entities

<u>Substantial number criterion</u>

This proposed rule, if implemented, would be expected to directly affect all commercial vessels that harvest reef fish using bottom longline gear in the eastern Gulf of Mexico, or an estimated 149 vessels. These vessels are a subset of the estimated 994 vessels permitted to harvest commercial quantities of reef fish in the Gulf of Mexico, or approximately 15 percent of permitted vessels.

Significant economic impacts

The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability.

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

All commercial entities expected to be directly affected by the measures in this proposed rule are determined for the purpose of this analysis to be small business entities, so the issue of disproportionality does not arise in the present case.

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

To reduce interactions between sea turtles and bottom longline gear in the reef fish fishery, the proposed action would prohibit the use of bottom longline gear to fish for reef fish in the eastern Gulf of Mexico (east of 85°30' W longitude) shoreward of a line approximating the 35-fathom depth contour in June through August**,** establish a permit endorsement to fish for reef fish using bottom longline gear in the eastern Gulf of Mexico**,** and limit the number of hooks per vessel that uses bottom longline gear to harvest reef fish to 1,000 hooks of which no more than 750 hooks can be rigged for fishing or fished. The expected effects of the proposed seasonal bottom longline gear prohibition and endorsement requirement were evaluated in tandem. A more detailed discussion of the methodology and results is contained in Section 6 and is incorporated herein by reference. Vessels affected by the proposed endorsement and gear restrictions would be expected to shift their effort to areas that remain open and continue to fish with bottom longline gear, convert to vertical line gear, or cease fishing during the affected period. However, because of the absence of adequate data, effort shift was not modeled in the analysis of the expected economic effects of this proposed rule. Instead, only gear conversion was modeled, with gear conversion rates allowed to vary from 0 percent to 100 percent of affected vessels and trips. Under this modeling approach, any affected effort that did not convert was assumed to not occur, resulting in the loss of all normal harvests and revenues for that vessel and trip. As such, this is an extreme assumption. In reality, rather than trip cancellation, effort shift is likely to occur, resulting in some level of continued historic harvest. The absence of effort shift as a behavioral option in the analysis results in over-estimation of the expected economic effects of this proposed rule and the following results should be viewed as upper bounds of expected effects.

This proposed rule, if implemented, would be expected to reduce the NOR of commercial vessels that have historically harvested reef fish using bottom longline gear by $1.28 million per year (100 percent gear conversion) to $3.44 million (0 percent gear conversion). Averaged across the average number vessels per year with recorded landings of reef fish in the eastern Gulf of Mexico using bottom longline gear from 2003-2007 (149 vessels), the estimated reduction in NOR per vessel ranges from approximately $8,600 to $23,100, or approximately 12 percent to 32 percent of average annual NOR per vessel. It is noted that individual vessels may experience higher or lower losses than these averages. Gear conversion is estimated to cost approximately $13,750 per vessel, though partial financial assistance is available for up to 50 vessels from an environmental advocacy group. Additional economic losses may accrue to the restriction on the number of hooks a bottom longline vessel may carry. Although these costs cannot be quantified with available data, the proposed hook limitations may result in reduced harvest efficiency of some vessels. This would be expected to result in either reduced total harvests or increased costs to maintain normal harvests as fishermen may be required to fish longer or make more sets. Hook limitations also increase the possibility that a trip may have to be terminated early if a line is lost and insufficient replacement hooks are available to allow continued fishing.

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

A list of all actions and alternatives and their expected effects is provided in Section 6 and is incorporated herein by reference.

Four alternatives, including the no action alternative (status quo), with multiple sub-alternatives, were considered for the action to establish seasonal and area gear restrictions. One alternative and set of sub-options focused on the geographic scope of the proposed gear restriction, one alternative and set of sub-options focused on the depth specification of the proposed gear restriction, and one alternative and set of sub-options focused on the temporal application of the proposed gear restriction. The no action alternative would not have established any new gear restrictions, would not reduce interactions between sea turtles and bottom longline gear in the reef fish fishery, and would not achieve the Council's objectives.

The alternative specifications of the geographic scope of the proposed gear restrictions would have imposed the restrictions on smaller areas than the proposed rule and, as a result, would be expected to result in lower adverse economic effects than the geographic scope of this proposed rule. However, the reduced geographic scope of these alternative specifications would be expected to result in insufficient reduction in interactions between sea turtles and bottom longline gear in the reef fish fishery and would not achieve the Council's objectives.

One alternative to the depth specification of this proposed rule would have prohibited the use of bottom longline gear to harvest reef fish in waters less than 30 fathoms, which would be less restrictive than the proposed restriction, while two alternatives would have been more restrictive, prohibiting the use of the gear in waters less than 40 fathoms and 50 fathoms. The less restrictive alternative would be expected to reduce the loss of NOR to commercial vessels relative to the proposed rule. However, the reduced scope of the restriction would be expected to result in insufficient reduction in interactions between sea turtles and bottom longline gear in the reef fish fishery and would not achieve the Council's objectives. While the two more restrictive alternatives may be expected to result in greater protection to sea turtles, both would be expected to result in greater adverse economic effects than the depth specification of this proposed rule. As a result, these alternative depth specifications would not achieve the Council's objectives of sufficiently reducing interactions between sea turtles and bottom longline gear while maintaining the economic viability of the bottom longline component of the commercial reef fish fishery.

Both alternatives to the seasonal specification of this proposed rule would have increased the length of the gear prohibition and would be expected to result in greater adverse economic effects than the seasonal restriction of this proposed rule. Similar to the more restrictive depth alternatives, while increased seasonal application of the proposed gear prohibition would be expected to result in greater sea turtle protection, these alternatives would not achieve the Council's objectives of sufficiently reducing interactions between sea turtles and bottom longline gear while maintaining the economic viability of the bottom longline component of the commercial reef fish fishery.

Seven alternatives, including the no action alternative (status quo), were considered for the action to reduce the number of vessels allowed to use bottom longline gear to harvest reef fish in the eastern Gulf of Mexico. Except for the no action alternative, the alternatives varied by the minimum average annual reef fish harvest threshold that would be required to qualify for a permit endorsement that allowed the use of bottom longline gear to harvest reef fish in the eastern Gulf of Mexico, and each alternative included two sub-options for the qualifying time period from which average annual harvests would be evaluated (1999-2004 or 1999-2007) and three sub-options that addressed the transferability of the endorsement. The no action alternative would not establish a longline endorsement to the reef fish permit, would not reduce the number of vessels (permits) allowed to use bottom longline gear to harvest reef fish in the eastern Gulf of Mexico, and would not achieve the Council's objectives.

Two alternatives would have established lower average annual harvest thresholds for endorsement qualification than this proposed rule (40,000 lb, gutted weight), 20,000 lb and 30,000 lb, while two alternatives would establish higher harvest thresholds, 50,000 lb and 60,000 lb. Because lower qualification thresholds would allow more vessels to continue historic activity, these alternatives would be expected to result in lower adverse economic effects than the proposed qualification threshold. However, these two alternatives would not be expected to result in sufficient reductions in the number of vessels allowed to use bottom longline gear to harvest reef fish in the eastern Gulf of Mexico or, in turn, sufficient reductions in bottom longline effort necessary to achieve target reductions in interactions between sea turtles and bottom longline gear in the commercial reef fish fishery. As a result, these alternatives would not achieve the Council's objectives. The two alternatives that would have established higher qualification thresholds would be expected to result in fewer qualifying vessels, greater economic losses, greater reduction in interactions between sea turtles and bottom longline gear than is necessary to achieve the Council's objective, and greater jeopardy to the economic viability of the bottom longline component of the commercial reef fish fishery.

Under the seventh alternative for the action to reduce the number of vessels allowed to use bottom longline gear to harvest reef fish in the eastern Gulf of Mexico, endorsement qualification would have been based on landings histories in communities where the ex-vessel value of red grouper landings accounted for at least 15 percent of the total ex-vessel value of all species landed in the community. Qualifying permits would be required to have reported landings in these communities for at least 5 years during the period of 1999-2007, with a minimum average annual reef fish harvest threshold of 30,000 lb per permit. The net economic effects of this alternative are unknown. However, while over 80 vessels would be expected to qualify for an endorsement under a 30,000 lb-threshold without a community-linkage requirement, fewer than 50 would qualify with the imposition of the community-linkage requirement. Further, this alternative was developed in an effort to protect communities dependent on the fishery. However, the alternative was determined to not be capable of achieving the Council's objectives because vessels with the permit endorsement could not be required to continue landing their harvests in the target communities.

This proposed rule would establish endorsement qualification based on harvest history from 1999-2007. The alternative period of evaluation, 1999-2004, would, for all landings thresholds, have resulted in fewer qualifying permits and greater adverse economic effects, and greater jeopardy to the economic viability of the bottom longline component of the commercial reef fish fishery, than the proposed rule.

This proposed rule would also allow unrestricted transfer of endorsements between commercial reef fish permit holders. The alternative sub-options would have either not allowed endorsement transfer or only allowed transfer to reef fish permit holders with a vessel of equal or lesser length. Each of these sub-options would have been more restrictive than the transfer specification of this proposed rule and, as a result, would be expected to result in greater adverse economic effects, and greater jeopardy to the economic viability of the bottom longline component of the commercial reef fish fishery, than the proposed action.

Four alternatives, including the no action alternative (status quo), were considered for the action to modify fishing gear or practices. The no action alternative would not establish further restrictions on fishing gear or practices and, as a result, would not achieve the Council's objectives.

One alternative, with multiple sub-options, to the proposed fishing gear provision of the proposed rule would limit mainline length for bottom longlines, while another would limit gangion length. The economic effects of these alternatives cannot be quantitatively evaluated with available data. In general, these actions would be expected to adversely affect the catch rates, operating efficiency, and NOR of affected vessels. Whether these alternatives would result in lower adverse economic effects than the proposed hook restriction is unknown. However, available data does not indicate that these measures would be more effective in reducing interactions between sea turtles and bottom longline gear than the proposed hook restriction.

Two alternative hook limits, 500 hooks and 1,500 hooks, were considered relative to the proposed limitation. The lower hook limit would be expected to result in greater adverse economic effects than the proposed limit and is more restrictive than believed necessary to achieve the target reduction in interactions between sea turtles and bottom longline gear. Conversely, while the higher hook limit would be expected to result in lower adverse economic effects than the proposed limit, it is not believed to be sufficiently restrictive to achieve the target reduction in sea turtle interactions.

The amendment on which this proposed rule is based also considered an action to establish restrictions on the bait used in the bottom longline reef fish fishery. Two alternatives, including the no action alternative (status quo), were considered. However, the no action alternative was selected by the Council as the preferred alternative. As a result, no regulatory action is required, no direct adverse economic effects would be expected to accrue to entities involved in the fishery, and the issue of significant alternatives is not relevant.

9.0 OTHER APPLICABLE LAW

The MSFCMA (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 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.

Upon submission to the Secretary, NMFS will determine if 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. Their determination will then be 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 MSFCMA. 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 will also undergo quality control prior to being used by the agency and a pre-dissemination review.

Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. Section 1531 et seq.) requires 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. NOAA Fisheries Service, as part of the Secretarial review process, will make a determination regarding the potential impacts of the proposed actions.

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 fishing efforts, 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.

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 the public is not overburdened with information requests, the federal government's information collection procedures are efficient, and 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.

Executive Orders

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires 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. The NOAA Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

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 a) has an annual effect on the economy of $100 million or more or adversely affects 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 and communities; b) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency; c) materially alters the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or d) raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order. NMFS has preliminarily determined that this action will not meet the economic significance threshold of any criteria.

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

This Executive Order requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. Impacts of commercial and recreational fishing on subsistence fishing are a concern in fisheries management; however, there are no such implications from the action proposed in this amendment.

E.O. 12962: Recreational Fisheries

This Executive Order requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and 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. [Sentence removed]

E.O. 13089: Coral Reef Protection

The Executive Order on Coral Reef Protection requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems, and, to the extent permitted by law, ensure 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).

Regulations are already in place to limit or reduce habitat impacts within the Flower Garden Banks National Marine Sanctuary. Additionally, NMFS approved and implemented Generic Amendment 3 for EFH, which established additional HAPCs and gear restrictions to protect corals throughout the Gulf. There are no implications to coral reefs by the actions proposed in this amendment. The alternatives in Action 11 (Creation of Time/Area Closures) will reduce impacts in the areas of proposed time/area closures, but although those areas contain hard bottom habitat, they are not areas of living coral reefs.

E.O. 13132: 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 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).

Action 13 (Federal Regulatory Compliance) would affect some reef fish vessels while fishing in state waters, but only those that have federal reef fish permits, as a condition of the permit. Vessels that choose not to fish in federal waters do not need federal permits and would not be subject to the provisions of this action.

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. 13158: Marine Protected Areas

This Executive Order 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. There are several MPAs, HAPCs, and gear-restricted areas in the eastern and northwestern Gulf. Actions 10 and 11 contain alternatives regarding the establishment of additional time/area closures and the duration of both new time/area closures and existing restricted fishing areas. The existing and proposed areas in these actions are entirely within federal waters of the Gulf of Mexico. They do not affect any areas reserved by federal, state, territorial, tribal or local jurisdictions.

Essential Fish Habitat

The amended MSFCMA included a new habitat conservation provision known as EFH that requires each existing and any new FMPs to describe and identify EFH for each federally managed species, minimize to the extent practicable impacts from fishing activities on EFH that are more than minimal and not temporary in nature, and identify other actions to encourage the conservation and enhancement of that EFH. To address these requirements the Council has, under separate action, approved an EIS (GMFMC 2004a) to address the new EFH requirements contained within the MSFCMA. Section 305(b)(2) requires federal agencies to obtain a consultation for any action that may adversely affect EFH. An EFH consultation will be conducted for this action.

10.0 SCOPING HEARING SUMMARIES

SUMMARY OF THE
PUBLIC HEARINGS ON
SCOPING DOCUMENT FOR AMENDMENT 31
SEA TURTLE/LONGLINE INTERACTIONS
PANAMA CITY, FL
December 9, 2008

Attendance:
Bill Teehan, Gulf Council
Ed Sapp, Gulf Council
Carrie Simmons, Gulf Council Staff
Karen Hoak, Gulf Council Staff
Michelle Mackie, FWC Division of Marine Fisheries

The scoping meeting to address bycatch of sea turtles in the Gulf of Mexico bottom longline reef fish fishery began at 6:00 p.m. CDT, with 14 members of the public in attendance and 5 members of the public commenting on the draft amendment 31 addressing bycatch of sea turtles in the bottom longline reef fish fishery. Carrie gave a brief presentation outlining the issues, legal responsibility of the Council, and potential alternatives to reduce interactions of turtles with bottom longline gear. After the presentation the following questions were asked.

1. Do observers really get paid $1,500 per trip?

2. Where did the recreational and vertical line estimates in the table (Table 1) in the scoping document of anticipated three year incidental take in the Gulf of Mexico Reef Fish Fishery come from?

Mr. Zales requested that Council staff find out where the recreational data on that table originated.

Bart Niquet

Suggested that there were more turtle interactions with bottom longlines because there were more sea turtles alive due to the reduction in number of shrimp trawls fishing and increased restrictions with TEDs on those still in the industry. He believes that the science is flawed on the estimates of interactions of sea turtles with longlines and needs to be addressed.

Dave McKenny-Environmental Defense

Suggested speeding up the implementation of the IFQs to reduce turtle and longline interactions and meet the Endangered Species Act guidelines by potentially increasing turtle population counts.

Bob Zales, II-Panama City Boatman’s Association

He felt that if IFQs were implemented, eliminating long line altogether should not be a problem because being able to fish at a slower pace would make it possible to eliminate the gear. He believes time/area closures are good. Potentially moving the longline fishery out to around the 50 fathom line might work since during the observer study, only one turtle was taken beyond that area. He noted that the difficulty in setting longlines south of Big Bend Florida is that the longline sets impacted red snapper or other reef fish as bycatch and IFQs may not be available to many of these fishermen. As red snapper increases in abundance, it increases its range and by going outside 50 fathoms, they would be less likely to interact with them.

Jim Clements-small commercial vertical line fishermen

Until recently, he believed that longlines were bad, but not anymore. The reason he doesn't think this is because bottom reef fish longliners supply consumers in the area with fresh fish. He also didn't think that moving bottom longliners out to 50 fathoms was a bad idea, because they would just convert their gear and fish inshore, fishing harder in areas where recreational and other commercial fishers were already fishing. In addition, vertical line fishers do catch turtles.

Bob Jones-Southeastern Fisheries Association

Attached at the end of the summary is a copy of the full letter read by Bob Jones at the scoping meeting.

Summary- He is concerned about how Amendment 31 is proceeding and does not believe there is necessity or legal justification for developing a plan now. There is no good reason to proceed with Amendment 31 at this time. National standard 9 requires bycatch to be minimized to the extent practicable, but until practical measures that are not yet used in the industry are suggested, no further minimization is possible. Under section 7 of the Endangered Species Act (ESA), NMFS determines whether a fishing action poses any jeopardy for a threatened species such as loggerhead sea turtles. Only if there is a jeopardy finding is there any legal requirement to develop management measures and then only "reasonable and prudent" ones. There is no justification of Council to take action ahead of the Biological Opinion. The Council cannot have a new Amendment ready in case the "BiOp" reaches jeopardy finding since no alternatives can be developed until we see what NMFS thinks would be reasonable and prudent measures to take. The Council should cease development of Amendment 31 until NMFS can complete a Section 7 consultation and prepare and new Biological Opinion using the best scientific information including data from the 2008 observer program. If the Biological Opinion concludes with no-jeopardy finding, which is likely, the Council should not proceed with Amendment 31 until on-going studies have identified effective and practicable ways to reduce turtle takes in reef fish longlining.

The focus needs to be on research and studies to find things that will work to reduce turtle mortality. We are cooperating with NMFS's Pascagoula Lab to get a study of hook guards underway. We are working with Ocean Conservancy on a plan to use hook timers to see whether lengthening or shortening soak times might help.

We are looking at other studies on commercial trips, to investigate the effects of bait type and size, hook type and size, leader length. We recognize the industry must take the lead on this research. NMFS does not have the financial resources to do much more than they are currently doing in cooperative research because they have never been adequately funded by Congress.

Lastly, a word of advice was given to everyone involved in vertical line fishing for Gulf of Mexico reef fish, both recreational and commercial:

In 1993-95, NMFS saw no turtle takes by the vertical line fishery, any more than it did by the longliners.

In 2001-04, more turtles were reported taken by commercial vertical line (11) than by longline (9).

In 2005, the estimated takes for the entire reef fish fishery were: 85 loggerhead sea turtles and 29 other sea turtles by longliners, 65 and 31 by commercial vertical line, 53 loggerhead sea turtles and 58 other sea turtles by the recreational sector- in all, 114 by longliners, but 207 by vertical line.

In 2006-07, the observers chanced to see usually high numbers of turtle takes by longline boats and none at all by commercial vertical line.

In 2008, the observations seem more reasonable: 3 turtles taken by longline, one by commercial vertical line. We do not yet know how many total takes those represent. With lower observer coverage, the one observed vertical line take may translate into more fleet-wide takes than the three observed on longline trips do.

For 2009, nobody knows. It may be the vertical line sectors turn to face an unreasonable over estimate. The data will come from commercial vertical line fishing trips but, they will be applied in estimating takes by recreational reef fish fishing (as the commercial data was applied in 2005).

The scoping meeting concluded at 7:30 p.m. CDT. One gentleman came to the meeting after it had ended and took a copy of the scoping document and business cards to submit written comments to the Council.

Written Comments Given at the Panama City Scoping Meeting

SOUTHEASTERN FISHERIES ASSOCIATION, INC.
ALABAMA • FLORIDA • GEORGIA • MISSISSIPPI • NORTH CAROLINA • SOUTH CAROLINA

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Gulf of Mexico Fishery Management Council
Amendment 31 Scoping Hearing: Panama City, Florida
December 9, 2008

Thank you Mr. Chairman for the opportunity to participate. My name is Bob Jones. I'm the executive director of Southeastern Fisheries Association located in Tallahassee, Florida a 501 c 6 non-profit fisheries trade association. We have members from every fishery in Florida and every gear type and businesses that handles seafood.
There were over 1.9 million jobs lost in 2008 and 533,000 of them were lost in November which is the most one-month decline in 34 years. I mention job losses to reiterate how harmful the loss of one more job will be to our nation.

We are concerned how Amendment 31 is proceeding. Is there really a necessity or legal justification for developing this plan now? The scoping document suggests six Alternatives. One is an increase in observer coverage. Of the other five, the scoping document dismisses four with warnings that they "would not significantly/sufficiently/substantially reduce" loggerhead sea turtle takes. The only alternative endorsed by the document is Alt. IV: "Area or time closures".

We wonder if there is scientific evidence that turtle takes are more common in some areas, some depths or some seasons than others. We can't discern that from the information we have seen.

Between 2000 and 2004, Fish and Wildlife Research Institute's estimates of numbers of loggerhead sea turtle nests on Florida beaches dropped by about 25,000 or around 45%. We don't know why but we doubt it was because of fishing. Female loggerhead sea turtles don't lay eggs every year but when they do, they make multiple nests, 25,000 fewer nests suggest about 15,000 fewer adult females. During those same years, 2000-2004, reef-fish Longliners killed maybe as many as one hundred adult females -about one half of one percent of the "missing" turtles. In 1993-95, NMFS put observers on reef-fish boats and they saw ZERO turtle takes. No problem.

In 2001-04, a sample of commercial reef-fish boats completed "Supplementary Discard Data Program" logbooks. 20 turtle takes were reported -9 by longliners and 11 by vertical-line boats. Under the Endangered Species Act, NMFS prepared a "Biological Opinion" in 2005, which correctly concluded that the reef fish fishery did not pose any jeopardy to turtles. The total number of takes was far too low to be a significant problem. NMFS estimated the longliners would take 85 loggerhead sea turtles per three years, while commercial vertical-line boats would take 65 and the recreational reef-fish fisheries would take 53. Those takes were formally allowed, under ESA.

In 2006, new observer programs started for reef-fish boats, though only 1% of trips had an observer. In the first 18 months, 18 turtle takes were observed, all on longline trips -with 7 on just one trip. Most or all of the 18 were loggerhead sea turtles. The data are so variable that they might mean anything or nothing. NMFS's best estimate is that the longline fleet took 902 turtles in 18 months or about 600 per year. That greatly exceeded the allowed take from 2005, triggering action that has become Amendment 31. But what really happened? In the 1990s, NMFS estimated zero takes. In 2005, they estimated about 30 per year by longliners and 50 by vertical-line boats (commercial &recreational combined). And the 2008 observer data? They are not yet final but THREE turtle takes were observed aboard longliners this year and ONE on a vertical-line boat We will have to wait to hear what those mean for the total take for the year. We do know that the longliners had only 3 turtle takes in 393 observed sets, compared to 18 in 559 sets during 2006-07. If there was the same total amount of reef-fish longlining in the Gulf each year that means that the overall turtle take will be estimated at around 150 for 2008.

Did annual takes by the longliners really go 0, 30, 600, and 150? Perhaps. But is it possible, and a lot more likely, that NMFS underestimated twice, then overestimated and maybe finally got to about the right answer? Because they used an underestimate in the 2005 BiOp, the *2006-07* overestimate was above the current allowed take -but could be the result of NMFS's poor estimates of turtle takes. It is not a result of anything new the longline fishery is doing.

Various interest groups have taken those inadequate estimates by NMFS and want to use them as a reason for banning reef-fish longlining and putting the longline fleet out of business at a time when the America needs every productive job it can hang onto. This not strictly a longline fishing gear problem.

The focus needs to be on research and studies to find things that will work to reduce turtle mortality. We are cooperating with NMFS's Pascagoula Lab to get a study of hook guards underway. We are working with Ocean Conservancy on a plan to use hook timers to see whether lengthening or shortening soak times might help.

We are looking at other studies, to be run on commercial trips, to investigate the effects of bait type and size, hook type and size, leader length etc.

We recognize the industry must take the lead on this research. NMFS does not have the financial resources to do much more than they are currently doing in cooperative research because they have never been adequately funded by Congress.

Timing and Scoping

There is no good reason to proceed with Amendment 31 at this time. The scoping document

claims that Magnuson-Stevens Act requires the Council to reduce bycatch and bycatch mortality. I'm not sure that's totally accurate.
National Standard 9 requires bycatch be minimized to the extent practicable. Until someone can suggest practicable measures that are not yet being used in the fishery, no further minimization is possible. Until the industry-led studies have progressed, nobody will have any practicable measures to offer. The scoping document does not offer any.

The scoping document also refers to the Endangered Species Act (ESA). What it doesn't explain is that the ESA process starts with a "Section 7 Consultation", in which NMFS determines whether some fishing action poses any jeopardy for a threatened species, like loggerhead sea turtles. Only if there is a jeopardy finding is there any legal requirement to develop new management measures and then only "reasonable and prudent" ones.

The last Section 7 Consultation for the reef-fish fishery was done in 2005 and the resulting Biological Opinion found, as expected, no jeopardy. The 2006-07 observations of turtle takes make a new Consultation and a new "BiOp" necessary. That has not yet been done and we cannot know what it might find, though the very low numbers of turtles killed by reef-fish longlining strongly suggest that the finding will again be "no jeopardy".

There is no justification for the Council to take action ahead of the consultation. The Council cannot have a new Amendment ready in case the "BiOp" reaches a jeopardy finding since no alternatives can be developed until we see what NMFS thinks would be reasonable and prudent measures to take.

The Council should cease development of Amendment 31 until NMFS can complete a Section 7 Consultation and prepare a new BiOp, using the best available scientific information -including data from the 2008 observer reports. If the BiOp concludes with a no-jeopardy finding, as is likely, the Council should not proceed with Amendment 31 until on-going studies have identified effective and practicable ways to reduce turtle takes in reef-fish longlining.

Lastly, a word of advice to everyone involved in vertical-line fishing for Gulf of Mexico reef-fish, both recreational and commercial:

In 1993-95, NMFS saw no turtle takes by in the vertical-line fishery, any more than it did by the longliners.
In 2001-04, more turtles were reported taken by commercial vertical-line than by longline -11 to 9.
In 2005, the estimated takes for the entire reef-fish fishery were: 85 loggerhead sea turtles and 29 other sea turtles by longliners, 65 and 31 by commercial vertical line, 53 loggerhead sea turtles and 58 other sea turtles by the recreational sector -in all, 114 by longliners but 207·by vertical line.
In 2006-07, the observers chanced to see unusually high numbers of sea turtle takes by longline boats and none at all by commercial vertical-line.
In 2008, the observations seem more reasonable: 3 turtles taken by longline, one by commercial vertical-line. We do not yet know how many total takes those represent. With lower observer coverage, the one observed vertical-line take may translate into more fleet-wide takes than the

three observed on longline trips do.

And 2009 nobody knows.

It may be the vertical-line sector's turn to face an unreasonable over-estimate. The data will come from commercial vertical-line fishing trips but they will be applied in estimating takes by recreational reef-fish fishing (as the commercial data was applied in 2005).

If there is any doubt that all reef-fishing sectors are under the gun, look at the scoping document's comment on Alternative III, where it considers longliners converting to vertical-line fishing. The document concludes that such conversion "might not significantly reduce sea turtle takes". Staff is already warning that vertical-line fishing is seen as equally harmful to turtles as longline fishing and that means all commercial and recreational vertical-line fishing.

Amendment 31 must be based on the requirements of the Magnuson-Stevens Act and the Endangered Species Act. Any new regulations must be founded on scientific analysis.

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Serving the Southeastern Seafood Industry proudly since 1952

SUMMARY OF THE
PUBLIC HEARINGS ON
SCOPING DOCUMENT FOR AMENDMENT 31
SEA TURTLE/LONGLINE INTERACTIONS (WITH ATTACHMENTS)

December 10, 2008 – Madeira Beach, FL

Council members	Council and NMFS staff	51 members of the public
Julie Morris	Steven Atran	
Bob Gill	Phyllis Miranda	
Ed Sapp	Jennifer Lee	

James Holder – Supported CCA position.

Sean Gucken – CCA - CCA's long-held position is that longline gear should be removed from the fishery. Sea turtle bycatch is just one more reason to do that. Red snapper bycatch is also increasing since the longline vessels do not have IFQ shares to keep the fish.

Tony Tucker - Mote Marine Laboratory – Mote has four years of sea turtle satellite tracking data. Of 46 turtles that have been tagged, 10 stayed within the west Florida shelf zone where sea turtle takes have been observed for as long as the radio tags were active. (provided printed figures of turtle locations).

Bob Spaeth– Southern Offshore Fishing Association – Recent data since the observer study show that the longline takes of sea turtles in 2008 were 3. Additional comments were read from a written statement. Highlights include:

- Bait modifications worth investigating are bait color and bait size.
- The section titles Modify Effort should actually be Reduce Soak Time. However, shorter soak times will result in more sets. Sea turtles are mostly taken during deployment and retrieval, so this may actually increase the number of sea turtle takes.
- Area or time closures will not be effective. The distribution of observed takes may represent the distribution of observers rather than that of sea turtles. If this is the case, such closures will displace fishermen to less efficient locations and times, but will not necessarily reduce sea turtle takes.
- Additional alternatives are suggested in the written statement, including the use of acoustic turtle scarers, short-term turtle avoidance notifications, weighting gear to sink more quickly, and upgrading of turtle handling procedures.

Amendment 31 is premature. The Council should not take action until the Biological Opinion is completed.

Jessica Koelsch – Ocean Conservancy –

- Urged quick action by the Council and NMFS.
- A strong commitment is needed from all sides to test gear modifications and increase observer coverage.
- If adequate monitoring is not possible, the fishery should stop until rulemaking is completed.

- A 90% reduction is needed to get back to the 2005 BiOp sea turtle take levels. To achieve this:
  1. Convert some or all longline vessels to vertical line vessels.
  2. Time/area restrictions should be implemented to prohibit fishing where they will have the greatest impact except for experimental fishing permits.
  3. Implement complete observer coverage on all sectors of fishing
- More sea turtle studies on foraging behavior, prey items, etc.

Mark Twinam – Commercial fisherman –
- Stopping fishing as the previous person suggested is a radical solution.
- Has seen tiger sharks caught by longlines that have sea turtles in them. If longlines are stopped, more tiger sharks will survive and predation on sea turtles will increase.

Dennis O'Hern – Fishing Rights Alliance –
- Opposes use of longlines in reef fish fishery due to high bycatch mortality.
- Questioned the numbers for recreational effort on pages 20-21 of the scoping document that suggested ocean effort was over 6 million trips in 1981 and over 14 million trips in 2004.
- A possible reason for the declines seen in sea turtle nesting is correlations with increases in hurricane activity.

John Schmidt – Commercial spearfisherman –
- Has fished adjacent to longline vessels and has made several longline trips, and has seen zero bycatch. He has never seen discarded sea turtles or fish in the vicinity of a longline boat. He has also never seen discarded longline gear in the water.
- Has also seen sea turtles in some of the sharks caught.
- Supports having a reasonable monitoring system.
- Give longline fishermen fair shake.

Will Ward – Gulf Fisherman's Association –
- Supports the comments by the previous speaker.
- Gear modifications and bait changes worked well for the pelagic longline fishery.
- Agreed that IFQs can consolidate vessels and reduce effort.
- It's unfair to put people out of work without first seeking a solution.
- Recommended convening a workshop between industry representatives and NGOs to develop recommendations.

Ed Small – Commercial longline fisherman –
- Since 1999 when he switched to reef fish fishing, he has only caught one sea turtle. In earlier years, fishing for sharks in shallower waters, he would catch two or three sea turtles per trip.
- Mexico has a 2.5 million pound sea turtle quota, but no infrastructure for reporting catches.
- Compared to the Mexican catches, trying to reduce sea turtle mortality by restricting longlines is like trying to empty a bilge using an eye dropper.

Steve Furman – CCA Tampa Chapter –

- CCA Florida Chapter supports moving longlines to 50 fathoms.

Jim Clements – Commercial vertical line fisherman –

- Consider the consequences of possible actions. Longline fishing has been around more than 30 years, and catches most of the grouper.
- It's unfair to punish only the longline fishermen. All fishermen interact with sea turtles. In addition, shore lights, sea walls and jetties have negative impacts.
- Sea gulls and pelicans are lures to shore by people and negatively impact sea turtles.
- If longlines are prohibited, the fishermen will switch to vertical line and will fish closer to shore, competing with existing fishermen. The gag quota could be filled as early as May.
- In the shrimp fishery, shrimpers were not removed from the fishery due to bycatch, but instead had gear modifications (TEDs).

Elizabeth Griffin – Scientist, Oceana –

- Concerned with estimates that 50 percent of the sea turtles caught are killed.
- Oceana has petitioned NMFS to changed status of loggerhead sea turtles from threatened to endangered.
- Continued use of squid for bait should be seriously evaluated.
- A report has just been released evaluating the use of squid as bait that recommends switching from squid to fish bait for pelagic longlines. A copy was provided to staff[14] .
- Supports the idea of holding a stakeholder workshop.
- Better observer coverage is needed both before and after implementing changes. If this is not possible, the fishery should be shut down.

William Henderson – Commercial vertical line fisherman –

- Noted that there are third world countries that have sea turtle hatcheries. Suggested that also be done in the U.S.

Bob Trumble – MRAG Americas –

Was not planning to speak and did not bring documentation, but will provide written documents to Council.

MRAG Americas ran a Hawaii longline observer program for several years. In the first year, the fishery was shut down in a couple of months due to observer coverage of sea turtle takes. After that, the fishery reduced its sea turtle bycatch and the fishery did not get shut down. MRAG has a report on the steps taken to reduce sea turtle bycatch.

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[14] NOAA Tech. Mem. NMFS-OPR-41 looked at combinations of bait and hook type/size in the pelagic longline fishery. For example, an 18/0 circle hook with squid bait compared to 9/0 J hook reduced loggerhead sea turtle catch between 77% and 85%. The same comparison of hooks types when large mackerel bait was used reduced loggerhead sea turtle catch between 88% and 90%. It recommended switching to fish bait from squid, and using specific size circle hooks depending on target species.

Matt Joswig – Commercial fisherman –

- Felt that the extrapolation of sea turtle takes from the small amount of data doesn't work to provide usable results. A more precise way to estimate takes is needed.
- NMFS should work with the longliners to try some of the suggested methods.
- Eliminating squid for bait will reduce the kill rate by 73%.
- Pushing longlines out of the fishery is not the answer.

<u>Written Comments Given at the Madeira Beach Scoping Meeting</u>

SOFA Statement on Amendment 31 Scoping Hearing: Madeira Beach

December 10, 2008

Thank the Chairman Morris for the opportunity to speak. The longline industry's position was made clear in Panama City last night and I'll provide a copy for the record. This evening, I'll touch on some details of the document.

We are glad of our ongoing collaboration with NMFS Pascagoula Lab and with the Ocean Conservancy. We want and need their cooperation and support. Before giving my statement we have five questions we'll make as part of our written statement:

1 Has the Council or NMFS considered what effect the 2009 interim measures recently taken under Amendment 30B will have with respect to decreasing the rate of turtle interactions in the western Gulf?

2 Does the Council or NMFS know whether turtle interactions with longline gear in the western Gulf are placing turtle populations in jeopardy and, if so, how do they know it? Is the Fisheries Service considering increasing observer coverage of the reef-fish· fishery as a means of increasing the accuracy of its data?

3 Does the Council or NMFS know what the effect on turtle interactions will be if all reef-fish longline sets were made beyond the 50 fathom line?

4 Under Alternative II, the Council is considering decreasing soak time as an option to reduce the number of turtles that drown when caught on longline hooks. According to the scoping document (p.12), loggerhead sea turtles spend most of their time near the surface, whereas reef fish are caught on or near the bottom. Is the Council therefore also considering the option of requiring longer soak times to reduce the number of turtles hooked during the harvest of the reef-fish quotas?

5. Is the Council or NMFS considering further regulation of the recreational and/or commercial vertical line reef-fish fishery as an option to reduce turtle interactions in the Gulf?

We are concerned about the range of Alternatives presented in the scoping document.

Alternative 0: No Action: The scoping document does not mention the No Action alternative, though it must be developed as required by NEPA. In Amendment 31, the No action option must be taken very seriously as it is alternative most likely to be chosen in the end, if NMFS comes to a "no jeopardy" finding when it completes its new Biological Opinion.

Alternative I: Modify Baits: This is one of the ideas being studied by the longline industry and it should be included among the list of Alternatives. There is more than a choice between squid and fish. There are other types of available bait, while bait color and bait size may be worth investigating.

Alternative II: Modify effort by changing fishing behavior and gear practices: This alternative is poorly named. It is really about reducing soak times so that a higher proportion of hooked turtles survive. That is a promising possibility which should be in the list of Alternatives.
So should the opposite: lengthening soak times to reduce the number of turtles hooked during the harvest of a fixed quota of groupers. [The scoping document is wrong to suggest that reducing soak times (or some other alternatives) might reduce catches. Those are fixed by quota. But it might well reduce catch rates, forcing longline fishermen to make more sets to catch the same amount of fish, thus exposing turtles to more hooks passing through the water.]

Alternative III: Modify gear: This Alternative contains two very different ideas which should be separated. The first is modifications to longline gear, with the scoping document suggesting weaker gangions and/or hook guards. Other options that are under active consideration include weaker hooks, different hook designs or sizes, and shorter gangions. The Alternative should be written very broadly for now on-going studies may throw up promising but unexpected gear modifications, such as floating hooks.

The separate idea, which needs its own Alternative, is the conversion of some or all longline effort into vertical-line fishing. As the scoping document says, it is unsure whether that would reduce turtle takes and it is far from sure that the idea is practicable but it should be included in the list of Alternatives. The Council will need to think very hard about how such a conversion might be brought about.

Alternative IV: Area or time closures: We agree that this Alternative must be considered. However, we are deeply concerned that the scoping document has singled this one Alternative out as the only one not given a warning that it may not produce much of a reduction in turtle takes. Of the 21 observed takes on reef-fish longlines, most came from the warmer months, from shallow waters and from one rather small area west of Madeira Beach. But most of the observers were deployed in the warmer months, on trips that set longlines in shallow waters west of Madeira Beach. Unless it can be shown that the observed takes were disproportionately high in that season and area, there will not be any reduction in takes by forcing longlining into times and places where it is less economically sustainable.

We have asked NMFS for the data that would show whether the takes were disproportionately high anywhere. To date, we only have access to the numbers on depth and they show absolutely no indication of any change in take rates with water depth. For Alternatives I through III and Alternative V, the scoping document correctly says that there might not be much effect on the numbers of turtle takes. For Alternative IV, it should say that an area closure based on depth will not be effective -or so the best available scientific information indicates.

Alternative V: Effort Reduction by Gear: This alternative seems ill considered. It does not, in fact, address effort reduction in the longline sector but only the number of participants in that sector. Excluding permits that have had only minimal involvement in the past will do little to reduce the overall effort level.

Cutting longline effort in the grouper fishery below that needed to harvest optimum yields is unlikely to be a practicable measure for minimizing turtle bycatch but it might be identified as a reasonable and prudent alternative under the ESA, if the "BiOp" reached a jeopardy finding. The Council should include an Alternative to provide for such cuts, though the means to bring them about may not be simple. They might include, for example, buying back a portion of the longline IFQ once that is issued.

Alternative VI: Observers: We all recognize that increased observer coverage would be a good thing, though it would not itself reduce turtle takes. We would welcome the better data that more observers on reef-fish boats would provide. However, there is little point in suggesting increased coverage unless funding to pay for those observers can be found. In the current economic climate, the commercial sector is in no position to pay the inflated costs of NMFS observers.

Other Alternatives: There are some promising ideas that are missing from the Alternatives in the scoping document:

Deployment of turtle scarers: There has been success with using acoustic systems to scare marine mammals away from fishing gear. Similar approaches have been tried to keep turtles away from pelagic longlines. They might work with reef-fish longlines.

Turtle avoidance: Whether long-term high-take areas can be identified and closed to longlining is doubtful. However, turtles do aggregate in local areas for short periods. Other fisheries have introduced bycatch-minimization based on boats moving away and notifying the rest of the fleet whenever they find themselves in a high-bycatch area. The idea is worth pursuing in reef-fish longlining.

Fishing practices: In addition to altering soak times, there may be other ways to reduce turtle takes through modified fishing practices, such as weighting the gear so that it sinks more quickly, or steaming either faster ·or slower during setting.

Turtle-handling practices: Requirements to handle any turtles that are caught in such a way as to maximize their survival, along with training in those methods, were introduced by the 2005 BiOp. Further upgrading should be considered in Amendment 31.

None of these alternatives is ready for immediate implementation but neither are any of the Alternatives proposed in the scoping document. Amendment 31 cannot be fully developed until further studies into reducing turtle takes have been completed.

The Council's work on amendment 31 is premature and unnecessary. The longline industry is, nevertheless, working to reduce turtle takes and will provide the Council with our results as they appear. If we can find effective and practicable measures, they should be incorporated into the FMP.

In the meanwhile, we are committed to working with the Council, NMFS, the environmental

NGOs and fellow fishermen to find ways to reduce our own and other industry's impacts on the loggerhead sea turtles.

Bobby Spaeth, Executive Director
SOFA

11.0 LIST OF PUBLIC HEARING LOCATIONS AND DATES

May 26, 2009	Travelodge	5201 Gulf Freeway	LaMarque	TX	77568	409-986-9777
May 27, 2009	Hilton Garden Inn	1101 US Highway 231	Panama City	FL	32405	850-392-1093
May 27, 2009	South Lafourche Levee District	17904 Hwy 3235	Galliano	LA	70354	985-632-7554
May 28, 2009	Wingate Inn	12009 Indian River Road	Biloxi	MS	39540	228-396-0036
June 4, 2009	City of Madeira Beach	300 Municipal Drive	Madeira Beach	FL	33708	727-391-9951
June 8, 2009	Banana Bay Resort	4590 Overseas Highway	Marathon	FL	33050	305-743-3500

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13.0 LIST OF PREPARERS

Name	Expertise	Responsibilities	Agency
Mr. Steven Atran	Population Dynamics Statistician	Summary/Introduction/Purpose, Framework Procedure, and Review	GMFMC
Dr. Assane Diagne	Economist	Economic Analyses and Review	GMFMC
Dr. Nicholas Farmer	Statistician Analyst	Data Analyses and Review	SERO
Ms. Susan Gerhart	Biologist	Summary/Introduction/Purpose, Actions and Alternatives, and Bycatch Practicability Analysis	SERO
Dr. Stephen Holiman	Economist	Economic Review	SERO
Mr. Peter Hood	Biologist	Summary/Introduction/Purpose, Actions and Alternatives, and Bycatch Practicability Analysis	SERO
Dr. Michael Jepson	Anthropologist	Social Impact Analyses and Review	SERO
Mr. David Keys	NEPA Specialist	NEPA Review	SERO
Ms. Jennifer Lee	Biologist	Protected Resources writer and Review	SERO
Ms. Cynthia Meyer	Biologist/GISP	Actions and Alternatives, GIS maps, and Review	SERO
Dr. Larry Perruso	Economist	Economic Analyses	SEFSC
Dr. Paul Richards	Analyst/Biologist	Review of document	SEFSC
Dr. Carrie Simmons	Biologist	Actions and Alternatives, Review, and document preparation	GMFMC
Dr. Jim Waters	Economist	Economic Analyses and Review	SEFSC

The IPT wishes to acknowledge Anne Meylan and Blair Witherington for the use of their data and knowledge of loggerhead nesting.

14.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE AMENDMENT/EIS ARE SENT:

Federal Agencies
Gulf of Mexico Fishery Management Council's
National Marine Fisheries Service
U.S. Coast Guard
Environmental Protection Agency

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

15.0 Index

APPENDIX A – CORRESPONDENCE FROM FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Florida Fish and Wildlife Conservation Commission

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Rodney Barreto
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Vice-Chair
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Gil McRae
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(727) 896-8626
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Managing fish and wildlife resources for their long-term well-being and the benefit of people.

Fish and Wildlife Research Institute
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St. Petersburg, Florida
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Fax: (727) 823-0166
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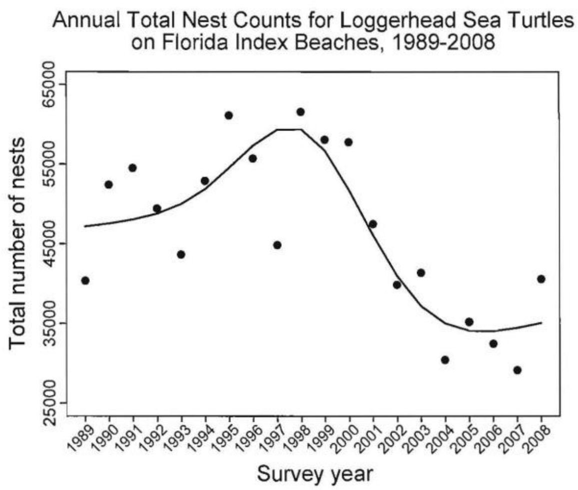
December 09, 2008

Richard Leard
Gulf of Mexico Fishery Management Council
2303 N. Lois Avenue, Suite 1100
Tampa, FL 33607

Dear Mr. Leard:

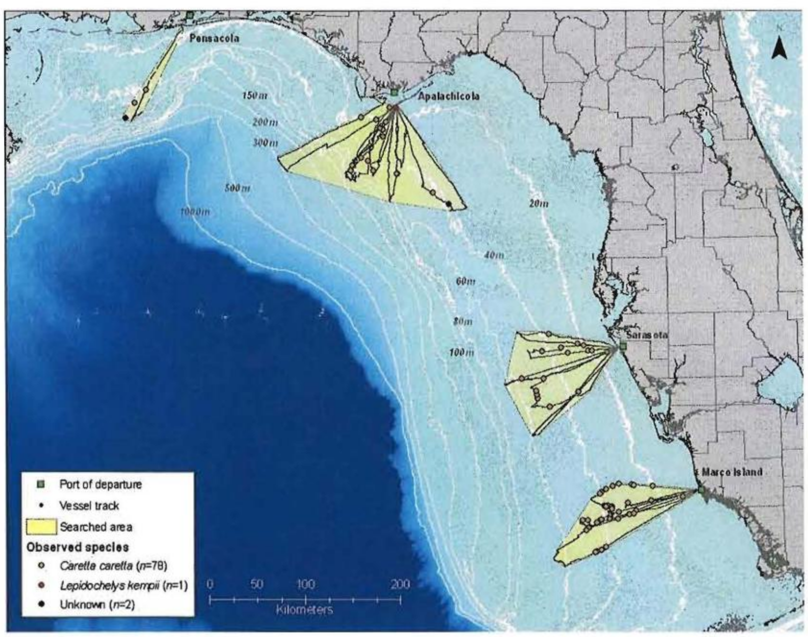
I am writing in response to the Notice of Intent by NMFS to prepare a draft environmental impact statement regarding management alternatives to reduce bycatch of sea turtles in the bottom longline component of the Gulf of Mexico reef fish fishery (Federal Register Vol. 73, No. 228 (25 November 2008), pp.71605-71606). Florida's loggerhead sea turtle nesting population has experienced a long-term decline (detailed below) that is of great concern to the state, as it is to the nation and world. In a paper in press (*Ecological Applications* 19(1): 136-160), FWC biologists have presented evidence that suggests that the decline in annual nest counts in Florida can best be explained by a decline in the number of adult female loggerheads in the population. In their analysis of the potential causes of the decline, they concluded that the factor that best fits the nesting decline is fisheries bycatch, based on temporal and spatial characteristics of the loggerhead nesting data, and concurrent nesting increases documented for Florida green turtles. Thus, the recent report by NMFS on the estimated take of sea turtles (primarily loggerheads) by the bottom longline reef fish fishery in the eastern Gulf of Mexico is of particular concern to us. I am writing to make you aware of two FWC datasets that suggest a potential spatial overlap of this fishery with the foraging grounds and migratory pathways of Florida loggerheads.

I'd first like to make you aware of our agency's long-term trend evaluation of the loggerhead turtle population that nests in Florida. The FWC/FWRI Index Nesting Beach Survey Program was created to generate representative sea turtle nesting data that would

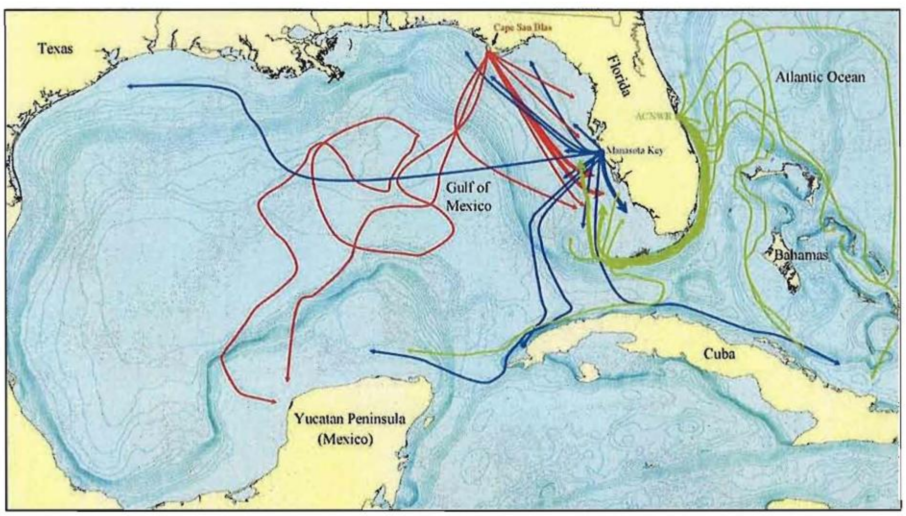


accurately reveal both spatial and temporal trends in Florida. INBS nest counts represent approximately 69 percent of known loggerhead nesting in Florida. Trend analysis of the last 20 years (1989–2008) of nest survey data shows a decrease of 26% in the annual nest density on surveyed shoreline over the 20-year period, and a 41% decline since 1998. Loggerhead nest numbers in 2008 were higher than in 2007, but this increase did not reverse the long-term declining trend that has occurred between 1998 and 2008.

The first dataset we have that is relevant to the potential overlap of loggerheads and the bottom longline reef fish fishery involves subadult and adult sea turtles that were observed by FWC staff ancillary to a study of neonate sea turtle ecology in the eastern Gulf of Mexico. Observations of sea turtles were made from a vessel launched at four ports along Florida's Gulf coast, July through August, 2005–2008. Vessel position and water depth (from WAAS GPS and integrated sonar) were recorded automatically, approximately every minute during vessel operation. Positions of adult and subadult loggerheads, one Kemp's ridley, and two unidentified turtles are represented below. Loggerheads were distributed between the coast and the 100 m depth contour. The mean water depth of vessel tracks from each port (34—58 m, n=4) was similar to the mean water depth of turtle observations off each port (33—49 m, n=4). The data show that the shelf waters of the eastern Gulf of Mexico off Florida provide habitat for important numbers of loggerhead sea turtles, including individuals with the highest reproductive value (subadults and adults) (Witherington and Hirama, unpublished data).



A second dataset relevant to the potential overlap of loggerheads with the longline reef fish fishery is from a study in which 38 adult female loggerheads were satellite-tracked after they nested in Florida between 1998 and 2002. The loggerheads originated from three widely separated nesting beaches (one in the Florida Panhandle, one in southwest Florida, and one in central-east Florida) and represented two Recovery Units of loggerheads in the Western North Atlantic (the Peninsular Florida Recovery Unit and the Northern Gulf of Mexico Recovery Unit). The most common destination after nesting for all of these turtles was the continental shelf in the eastern Gulf of Mexico with about 60% of the turtles taking up residence here. They were all known to remain in this area for the duration of their satellite transmitters' battery life. In the first figure below, thicker lines represent two or more turtles following the same migratory pathway. The second figure shows the total number of satellite-received locations from 24 loggerheads that exhibited residency in the eastern Gulf of Mexico. Filtered ARGOS satellite locations were summed within 5 km hexagonal bins in order to display areas frequented by these animals. The absence of data points does not imply absence of turtles. (Sources: Foley *et al.*, poster presentation at 25th International Sea Turtle Symposium; Schroeder *et al.,* manuscript in prep.)



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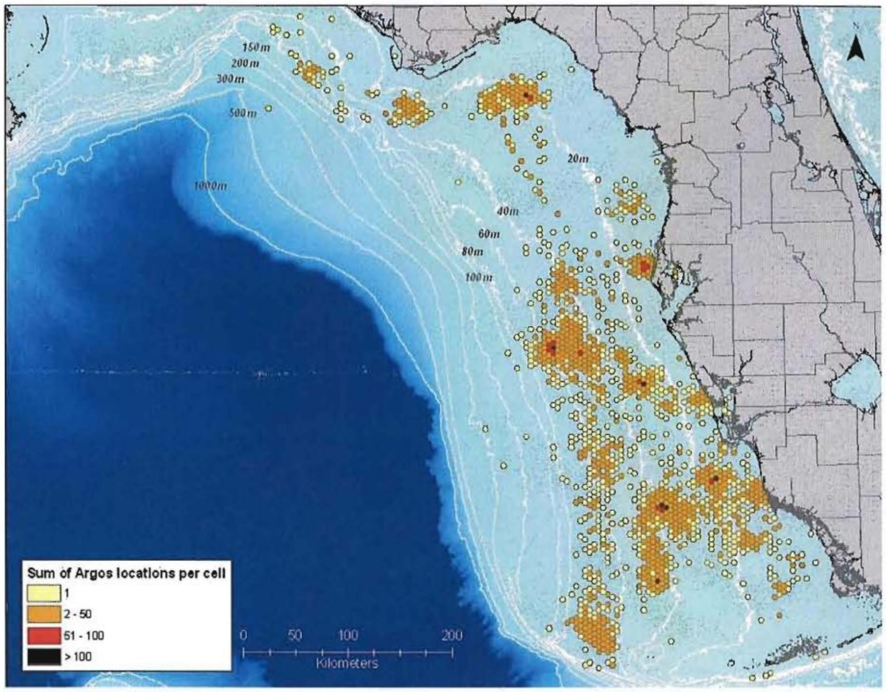
January 9, 2009



I wanted to make these various datasets available to you for your consideration in this critical matter and to offer further assistance and expertise as needed to NMFS and the Council. If you have any questions about the methodologies used in the studies, or any other aspects, please contact Dr. Anne Meylan @ 727-896-8626 ext. 1916 or Anne.Meylan@MyFWC.com.

Sincerely,

Gil McRae, Director
Fish and Wildlife Research Institute

cc: Carrie Simmons
Roy Crabtree
Jennifer Lee
Ken Haddad
Mark Robson

APPENDIX B – CORRESPONDENCE RECEIVED FROM MOTE MARINE LABORATORY

MOTE MARINE LABORATORY
1600 Ken Thompson Parkway
Sarasota, Florida 34236-1096 USA
(941) 388-4441 • FAX: (941) 388-4312
info@mote.org • www.mote.org

Judy Graham
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Kumar Mahadevan, Ph.D.
President & CEO

Mote Aquaculture Park • 12300 Fruitville Road • Sarasota, FL 34240-8988 • Phone: (941) 388-4541 • Fax: (941) 377-2905
Charlotte Harbor Field Station • P.O. Box 2197 • Pineland, FL 33945-2197 • Phone: (239) 283-1622 • Fax: (239) 283-2466
Tropical Research Laboratory • 24244 Overseas Highway • Summerland Key, FL 33042-4803 • Phone: (305) 745-2729 • Fax: (305) 745-2730
Mote Living Reef Exhibit at the NOAA Eco-Discovery Center • 35 East Quay Road • Key West, FL 33040-6624 • Phone: (305) 296-3551 • Fax: (305) 296-2325

Dec. 22, 2008

Peter Hood
NOAA Fisheries, Southeast Region
263 13 th Ave. South
St. Petersburg, FL 33701

Dear Mr. Hood,

I am writing in response to a Notice of Intent by NMFS to prepare a draft environmental impact statement regarding management alternatives to reduce bycatch of sea turtles in the bottom longline component of the Gulf of Mexico reef fish fishery (Federal Register Vo. 73, No. 228 (25 November 2008), pp. 71650-71606).

Florida hosts the 90% of the US loggerhead nesting and is only one of two populations worldwide with more than 40,000 nests annually. Consequently, the NMFS observer report (NMFS-SEFSC PRD 07/08-15) on the estimated take of sea turtles (primarily loggerheads) by the bottom longline reef fish fishery in the eastern Gulf of Mexico is of particular concern to Mote Marine Laboratory (MML). MML has a 28 year history of monitoring at the largest loggerhead rookery in the Gulf of Mexico spread across Sarasota County. I write to identify MML datasets that clearly demonstrate substantial spatial overlap of this fishery with foraging grounds and migratory pathways of Florida loggerheads. I have presented this info to a scoping meeting hosted by the Gulf of Mexico Fisheries Management Council to bring this spatial overlap to broader attention.

The Sea Turtle Conservation and Research Program at MML has actively tracked sea turtles via satellite telemetry during 2005-2008. The following comments are unpublished empirical data from tracking nesting female loggerheads, and currently in prep for submission to various scientific journals.

The first dataset relevant to an environmental impact assessment illustrates the home foraging grounds of 46 loggerheads tagged in SW Florida and satellite tracked from nesting ground to their foraging grounds (**Figure 1**). Each symbol on the map represents a location rather than a density distribution of the actual points. The tracking map clearly indicates that loggerhead females range widely through the Gulf of Mexico, inside and outside the U. S. EEZ, and into international waters of Mexico, Cuba, and the Bahamas.

These loggerhead home foraging grounds may be compared more closely in relation to locations of turtle takes and observations recorded by the grouper fishery (**compare Figure 2 and 3**). There is a clear and substantial spatial overlap of fishery effort and loggerhead home ranges.

Takes of turtles in the grouper longline fishery were primarily between 20-50 fathoms (= 36-91 meters). A foraging depths histogram illustrates that the fishing zones by depth overlap with a third of the loggerhead females tracked by satellite telemetry (**Figure 4**). These data also clearly show overlap of the grouper fishery and loggerhead home ranges.

It can be further noted that the loggerheads occupied this foraging zone year round and for 2-4 years until a next reproductive migration. These factors are reasonable indications that mature turtles remain at continued risk for the temporal duration of the grouper fishery, although some females and males migrate away from April to August to near shore zones for mating and nesting, and return for another remigration period of years within a foraging home range.

Lastly, it is encouraging that much recent research has already occurred on methods that reduce bycatch of loggerheads in other components of the U.S. longline fisheries, such as the North Atlantic swordfish longlines and the north Pacific tuna longlines. Methods such as changes of bait from squid to mackerel, circle hooks as an alternative to J hooks, depth of longline set relative to the surface, etc. were research and developed by NMFS offices based in Miami and Honolulu. That existing knowledge would enable a rapid technology transfer of proven mitigation methods that are immediately applicable as mitigation options in the Gulf longline fishery.

Thank you for the opportunity to bring these various empirical datasets to the discussion of impacts. The limitations of the observer based program are understood and so I trust that MML empirical datasets will be considered in this critical matter. I am glad to offer further assistance and expertise as needed to NMFS or the Fisheries Management Council. If you have questions about the methods or these studies, please do not hesitate to contact me, tel. 941-388-4441 ext. 470 or tucker@mote.org

Sincerely,

Tony Tucker

Tony Tucker, Ph.D.
Staff Scientist
Sea Turtle Conservation and Research, Mote Marine Laboratory

cc: Dr. Kumar Mahadevan, MML
Dr. John Reynolds, MML

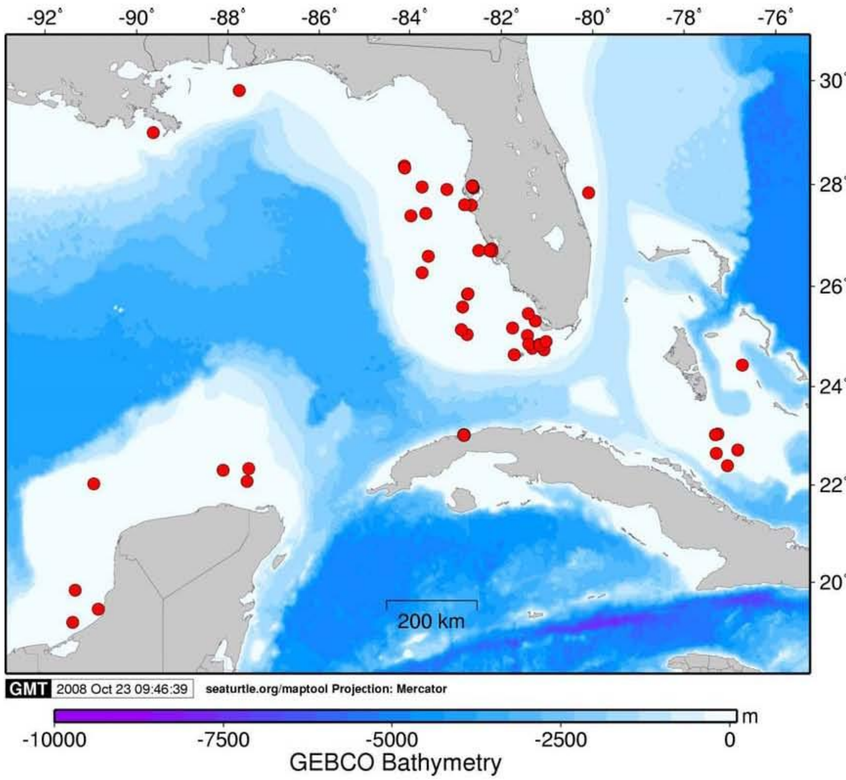
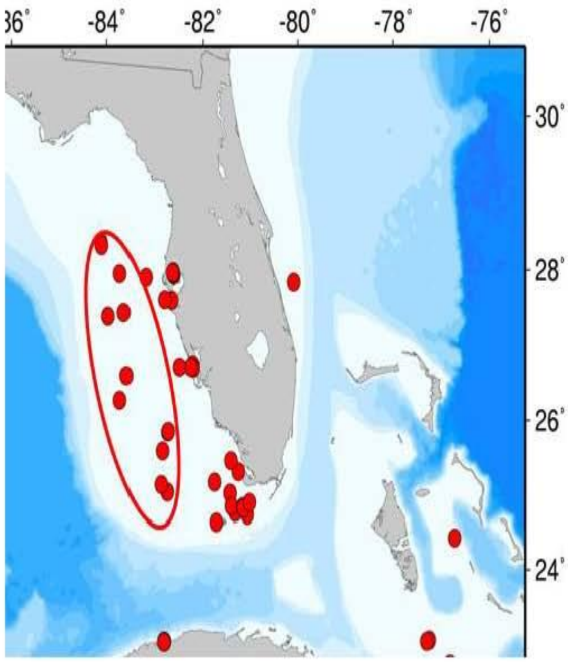


Figure 1. Foraging destinations of 46 loggerhead females tracked from Casey Key, Sarasota County rookery to home foraging areas. The females may stay in foraging residency for 1-6 years although most migrate every 2-4 years (also known as the remigration interval) to a natal beach. Data: T. Tucker/ Mote Marine Laboratory, in prep.



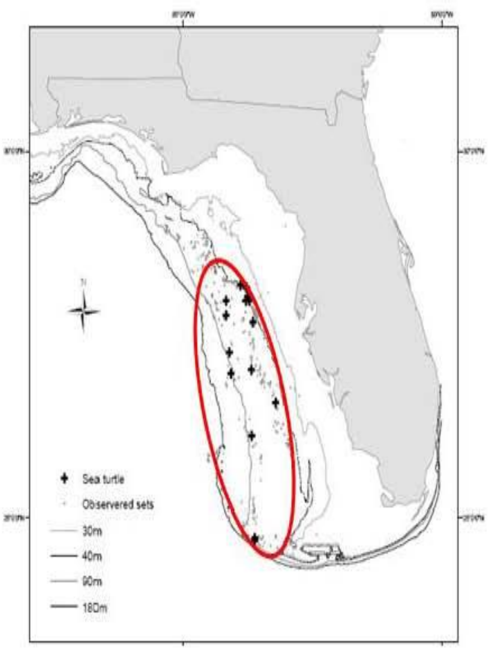


Figure 2 (left panel) shows satellite tracked loggerheads on the west Florida Shelf.
Figure 3 (right panel) shows spatial locations of Gulf of Mexico bottom longlines sets targeting reef fish and takes of sea turtles. Maps were aligned by eye in this side-by-side comparison since GIS coordinates were unavailable with the NMFS data. Right panel is adapted from NMFS-SEFSC PRD 07/08-15.

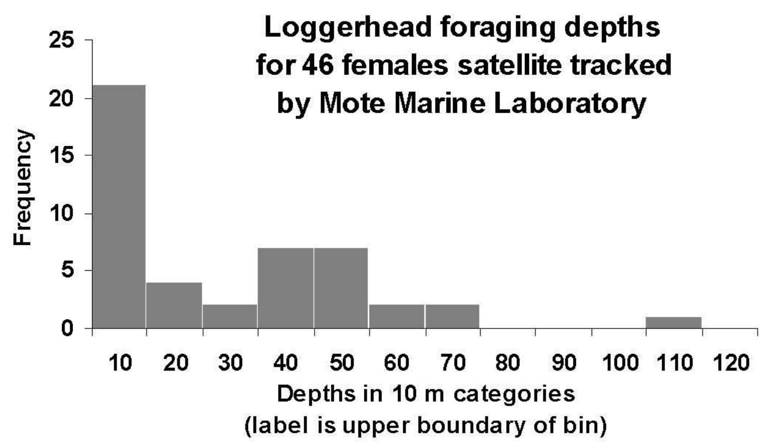


Figure 4. Depths of loggerhead foraging grounds were based on bathymetry of satellite telemetry of locations. Takes of turtles in the grouper longline fishery were primarily between 20-50 fathoms (= 36-91 meters). This fishing zone by depth overlaps with 32.6% (15/46) of the loggerhead females tracked by satellite telemetry, as illustrated by a foraging depths histogram. When evaluating only the females within the west Florida Shelf occupied by the grouper fishery study, the percentages are 72% (18/25 females) of satellite tracked loggerheads occupied the same depths as the grouper fishery. These data clearly show overlap of the fishery and loggerhead home ranges. There are no associated time at depth data to indicate a time budget for percentage of the water column occupied by the loggerheads.

APPENDIX C – ALTERNATIVES CONSIDERED BUT REJECTED DURING THE PUBLIC REVIEW PROCESS

1. Require a minimum bait size (i.e.,? x ? inch) in the bottom longline reef fish fishery.

The Council considered a requirement of a minimum bait size (i.e., ? x ? inch) for all bait used in the bottom longline reef fish fishery as a mitigation measure for hardshell sea turtles in the bottom longline commercial reef fish fishery. However, specific studies on bait size and hardshell sea turtles have not been completed to determine what the best minimum bait size would be. There was one requirement in regards to the differences from the bait size definition with the current definitions for reef fish bait under 50 CFR 622.38 which states: Small pieces no larger than 3 $inches^3$ (7.6 cm^3) or strips no larger than 3 inches by 9 inches (7.6 cm by 22.9 cm) that have the skin attached and are frozen, refrigerated, or held in brine. With this requirement in mind there have been no studies on this minimum bait size and mitigation measures for hardshell sea turtles in the bottom longline reef fish fishery. With little information available the Council did not feel that a minimum bait size would be enforceable or practical for the bottom longline reef fish fishery as a mitigation measure for hardshell sea turtles.

2. Do not allow longline fishing less than a specific depth of 60 fathoms.

The Council considered the closure of areas at 60 fathoms and less because it would encompass the area where 100% of the sea turtles takes were documented by observers. However, the available bathymetry data has not been delineated by NOAA's National Ocean Service for the 60 fathom contour. If the Council had continued to pursue this alternative it would take up to six months to delineate a depth contour from the available bathymetry data. The next available depth contour was 82 fathoms, which outside the range of alternatives. The Council felt that the other options for depth closures were better addresses sea turtle mitigation in the bottom longline reef fish fishery.

3. Longline endorsements -during the 1995-2007 period

The Council considered the 1995-2007 time period for endorsement eligibility because this time interval would represent the longest available data series. However, missing permit transfer records in the early years could lead to incorrect landing assignments. Remaining qualifying periods considered for endorsement eligibility start in 1999. The Council elected to reject the 1995-2007 option to avoid the assignment of landings to the wrong permit holders and to avoid placing too much emphasis on historical landings. The Council determined that qualifying periods starting in 1999 would accurately account for the present and historical participation in the fishery.

4. Observers and Electronic Monitoring in the bottom longline reef fish fishery.

The Council considered options to use observers or electronic monitoring (EM) such that if the observed sea turtle takes exceeded some take threshold, the eastern Gulf bottom longline component of the reef fish fishery would be closed for the remainder of the fishing year. The Council determined not to pursue this action because of hurdles to implementing the system. The major hurdle was that to monitor take relative to the threshold in any real-time manner, it would take nearly 100% coverage of the fishery. This would be very expensive for the fishery or NMFS, depending on who carried the cost burden.

Estimates provided to the Council indicated that on average the operator of a bottom longline vessel would have to pay between $28,000 and $32,000 per year for 100% coverage to carry an observer. For vessels away from port above this average, the costs would be greater. If NMFS covered the costs of observers, NMFS would need to pay approximately 4.62 to 5.28 million dollars for 100% observer coverage. NMFS would need to receive adequate appropriations to cover these costs. Currently, NMFS has allocated approximately $250,000 annually to monitor the entire commercial reef fish fishery.

Electronic monitoring is also expensive, but less expensive than observers. The estimated average annual cost for EM was estimated at $12,000 per vessel if the owner operator covered the costs. As with observers, this cost increases if the vessel spends more time than average away from port. If NMFS were to pay for the cost of the EM, assuming NMFS would receive adequate appropriations to cover the cost of EM and their installation, the cost would be approximately two million dollars to run the program based on current effort. Additionally, EM has other problems. These there would be a delay in implementation, EM is susceptible to tampering with by fishermen, and video image quality problems can arise from salt spray, inadequate camera angles, and fishing under low light conditions.

5. Limit soak time (soak time is defined as the last hook in the water to the first hook out of the water) in the bottom longline reef fish fishery under the Action to modify fishing practices and gear.

The Council considered limiting soak time in the bottom longline reef fish fishery as a mitigation measure to reduce sea turtle interactions with bottom longline gear, and ultimately reduce mortality of hardshell sea turtles due to drowning. This alternative was moved to considered, but rejected due to the impracticability of law enforcement effectively monitor and enforcing such a soak time limitation. It addition to enforcement issues there are several variables that determine the amount of time a sea turtle can spend underwater. A practical soak time for the fishery combined with the amount of time a hooked or entangled sea turtle can spend under water is unknown and therefore would be impractical to impose on the bottom longline reef fish fishery without further study and information.

6. Modify the Reef Fish FMP framework procedure for setting TAC by adding Annual Catch Limit (ACL) and Annual Catch Target (ACT) as items that can be modified under the framework, renaming it Framework Procedure for Setting ACL, and making additional editorial changes to reflect current terminology and procedures.

The Council considered modifying the Reef Fish FMP framework procedure for setting TAC in this amendment, but later decided it should be moved into another amendment.

APPENDIX D -- COMMENTS RECEIVED FROM THE EPA ON THE DRAFT ENVIRONMENTAL IMACT STATEMENT (DEIS) FOR AMENDMENT 31 TO THE FISHERY MANANGEMENT PLAN FOR REEF FISH RESOURCES OF THE GULF OF MEXICO (Reef Fish FMP).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

2009 DEC -9 AM 10: 56

December 7, 2009

Dr. Roy E. Crabtree
Regional Administrator
Southeast Regional Office
National Oceanic and Atmospheric Administration
263 13th Avenue South
St. Petersburg, Florida 33701

Subject: EPA NEPA Comments on NOAA DEIS for Amendment 31 to the "Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico"; Gulf of Mexico Fishery Management Council; Gulf of Mexico; CEQ No. 20090390; ERP No. NOA-E91029-00

Dear Dr. Crabtree:

Consistent with our responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the National Oceanic and Atmospheric Administration's (NOAA) Draft Environmental Impact Statement (DEIS) for Reef Fish Amendment 31. This amendment concerns the reduction of sea turtle bycatch from the bottom longline component of the Reef Fish Fishery.

Background

Federally-protected sea turtles in the Gulf of Mexico are the loggerhead, green, hawksbill, Kemp's ridley, olive's ridley and leatherneck. Florida has the world's second highest population of loggerheads and 90% of the beach nesting sites (pg. 4). Sea turtles are attracted to and caught by baited hooks set on commercial bottom longlines and other hook-and-line fishing gear such as commercial and recreational vertical lines.[1] Such incidental takes (takes, takings) can result in fishers discarding turtles that are alive or dead, or of unknown condition.[2] The overall turtle bycatch from longline and vertical line gear predicted by the 2005 Biological Opinion (BioOp, prepared for the reef fish fishery consistent with the Endangered Species Act: ESA) is significant. Table 1.1.1 (pg. 2) presents the anticipated BioOp turtle total (and lethal) takes over a three-year period: 203 (78) loggerheads, 51 (21) greens, 44 (13) hawksbills, 20 (9) leathernecks, and

[1] Vertical lines are commercial and recreational fishing lines with one or more baited hooks that are individually set vertically overboard (internet).

[2] The survival rates of turtle discards released alive but of "unknown condition" is unclear, such that the actual number of lethal discards may be greater than currently assumed if sublethal effects from hook-captures ultimately result in turtle mortality soon after their release. Have studies been done on turtle survival rates of live discards?

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3 (1) Kemp's ridleys. Moreover, actual takings during this timeframe exceeded those predictions. It is noteworthy that the percentage mortalities of commercial bottom longlines were greater than for either commercial or recreational vertical lines, with lethal takes of loggerheads (85/42) and greens (26/13) being approximately 50% more for bottom longline gear.

Bottom longline sets can stretch for miles in open ocean and reef areas. Pelagic and reef longlines can have substantive environmental concerns. For reef areas, bottom longlines are not selective and therefore include bycatch of non-target species (such as sea turtles) and illegal target species (such as regulatory discards of snapper) and also damage bottom habitat. Because soak times of longlines are longer than vertical lines, they are more likely to drown turtles (which must surface for air after about one hour underwater) than vertical lines (internet). Longlines can also attract and hook sea birds at the surface during the setting process before the bait settles in the water column. However, vertical line sets require more frequent anchoring than longlines, which can substantively damage reefs, and vertical lines can also hook sea turtles.

Overall, it appears that several factors should be considered for regulations intended to minimize the bycatch of sea turtles from bottom longlines. These include:

* *Gear* – Do bottom longlines consistently catch more sea turtles than vertical lines or other hook-and-line fishing gear?
* *Hooks* – Do circle hooks, hook guards or other fishing hook modifications reduce or physically prevent the hooking of sea turtles while still allowing the hook-capture of legally-sized target species ?
* *Location* – Does the offshore (depth) or alongshore location of the gear sets affect the level of turtle bycatch?
* *Bait* – Are there baits (and bait sizes) for bottom longlines and other hook-and-line gear to which sea turtles are not or less attracted, while still being attractive to target species?
* *Repellants* – Are there any sea turtle repellants that discourage turtles from hook-and-line gear but do not affect target species?
* *Soak Time* – Do shorter gear soak times (less than sea turtle air breathing minimum times of approximately one hour), result in less turtle drownings than longer sets?
* *Timing of Sets* – Does setting gear during certain times of day that are not coincided with prime turtle feeding times[3] result in less turtle bycatch?
* *Cumulative Effects* – Does the hook-and-line gear of choice have other negative overall effects such as the bycatch of sea birds during settings or the damage of reef habitat?

The DEIS considers several – but not all – of these factors in its four actions and multiple alternatives, options and suboptions. We offer the following comments on alternatives as well as the enclosed *Additional Comments*.

[3] Sunset may be one of these times to be avoided. The FEIS should discuss.

Alternatives

*** <u>Action 1</u> – Allow or disallow squid bait in the bottom longline component of the Reef Fish Fishery.**

+ <u>Alternative 1 (*No Action and NOAA's DEIS preferred alternative*)</u>: This alternative would allow the continued use of squid as bait. As discussed below, EPA disagrees with NOAA's preference for Alternative 1 to continue the use of squid as longline bait unless NOAA and the Council believe field and laboratory data showing turtle preference for squid are not conclusive.

+ <u>Alternative 2 (*Prohibit the use of squid as bait*)</u>: Overall, EPA tentatively disagrees with NOAA's preference for the no action alternative. The DEIS indicates that sea turtles prefer squid over fish baits hooked both laboratory and field studies, although data may be limited and some societal effects may result. For example, the field observer study discussed on page 16 indicates that loggerhead turtles were hooked on squid (38%), fish (19%), and unknown bait (43%). If NOAA believes that existing data are not conclusive enough to change a longstanding bait in the longline fishing industry, we suggest that further studies be prioritized. For example, the collection of additional observer data for turtle bycatch onboard commercial vessels for different baits (squid vs. others) and different gear (e.g., longlines vs. vertical lines) should be a fairly inexpensive.

It should be noted that changing baits is one of the easiest ways to reduce turtle takings, when compared to the more substantive changes such as fishing gear or practices addressed in the other actions considered below. On the other hand, we understand that squid have been used by longliners for some time and that the tough texture of squid is ideal for bait during long soak times of bottom longlines. However, the use of "softer" fish bait is ideal for "nibblers" such as turtles that can thereby better avoid longline hooks. Moreover, the use of shorter soak times (to avoid the deterioration and loss of softer bait) could also help reduce the lethal turtle takes since gear may be retrieved within turtle underwater survival times.

In addition to studies to determine turtle bait preferences, other studies for Amendment 31 may be warranted. Given that consideration of societal effects on fishers is a NOAA mandate, we suggest that societal and economic impacts of changing baits to non-squid baits be further researched – including mitigation for such impacts if a bait change is effective. Similarly, the "unknown" baits to which turtles were hooked 43% of the time in the above-referenced field study (pg. 16) should be further investigated so that appropriate alternate baits to squid are not selected.

A frequent dilemma in fishery management regulations is whether or not to issue rulemaking or perhaps delay it if the level of supportive information is perhaps not sufficient. We will defer to NOAA and the Council regarding the level of information that exists (or can still be determined before rulemaking) regarding turtle attraction to squid. If the field (observer) and lab data on turtle preferences for squid discussed in the DEIS (or that is perhaps developed) demonstrates that loggerhead turtles are attracted to and hooked by squid baits are considered reputable, further consideration for prohibiting squid bait (Alt.2 of Act. 1) should be provided in the FEIS. Again, a change in bait would appear to be a relatively simple modification compared to changing other more substantive fishery practices and gear.

*** Action 2 – Restrict the use of bottomline gear for reef fish in the Eastern Gulf of Mexico (east of 85° 30' W longitude, near Cape San Blas, Florida).**

+ Alternative 1 (*No Action*): This alternative would continue year round bottom longline fishing throughout the eastern Gulf in waters seaward of 20 fathoms. EPA does not support the no action since efforts should be made to limit the bottom longline fishery and thereby limit turtle bycatch and other reef impacts. EPA will defer to NOAA and the Council for appropriate limitations on fishing boundaries, depths and seasons. However, these restrictions must be based on reputable data and consider societal effects, particularly on any Environmental Justice (EJ) fishers in the bottom longline fleet.

+ Alternative 2 (Establish north-south fishing boundaries: *NOAA Preferred*): EPA agrees with establishing boundaries based on NOAA or other appropriate research. We will defer to NOAA and the Council for specific locations for such closures or acceptable longline fishing areas. Societal effects of disallowing fishing along certain coastlines, particularly on any EJ fishers, should be considered.

+ Alternative 3 (Establish fishing depths: *NOAA Preferred*): Similar to above Alternative 2, EPA agrees with establishing depths to limit the longline fishery based on NOAA and other research, and will defer to NOAA and the Council for specific depths for such closures. Societal effects of disallowing fishing at certain depths, particularly on any EJ fishers, should be considered.

+ Alternative 4 (Establish fishing seasons: *NOAA Preferred*): Similar to above Alternatives 2 and 3, EPA agrees with establishing such fishing seasons based on NOAA or other appropriate research, and will defer to NOAA and the Council for the best seasonal times for closures. Also, if seasonal closures affect fishers with different fishing seasons along the Gulf coast differently in terms of their consequential expected landings (e.g., quota remaining to them during their fishing season), societal effects should be documented in the FEIS as well as any EJ fisher impacts.

*** Action 3 – Longline Endorsements to fish east of Cape San Blas.**

+ Alternative 1 (No Action): Under this alternative, no longline endorsements to the reef fish permits to use traps and longline gear would be offered. As such, no regulatory changes in the number of harvested reef fishes would occur for the present permit holders that are fishing with bottom longlines. EPA does not support this alternative since it would not reduce the bottom longline fishery and thereby turtle bycatch and other bottom longline impacts. However, we defer to NOAA and the Council regarding the actual level of endorsements, eligibility requirements, and ultimately the resultant participant/vessel reductions discussed in Alternatives 2-7.

However, reductions in participating fishers would need to consider societal impacts to fishers, particularly any EJ fishers, if other gear (e.g., vertical lines) or other local fisheries cannot be substituted for displaced bottom longline fishers.

+ Alternative 2 (*Reduce the number of participants to an unspecified level*): In order to qualify for a longline endorsement, permit holders under Alternative 2 would only need to have minimal annual average reef fish landings of 20,000 pounds for either the 1999-2004 (Option a) or 1999-2007 (Option b) timeframe. Unlike Alternatives 3-7, the number of reduced participants associated with this alternative is unspecified in the DEIS (but should be in the FEIS for comparison with other alternatives). EPA defers to NOAA and the Council regarding the effectiveness and appropriate data timeframe of this alternative, but does not favor Alternative 2 since it offers the least reduction in the longline fishery, and therefore the least reduction in sea turtle bycatch and other reef impacts can be assumed.

+ Alternative 3 (*Reduce the number of participants to 82*): For Alternative 3, endorsements for eligible permit holders would be based on a 30,000 pound landings history. A reduction to 82 participants is expected. Again, EPA defers to NOAA and the Council regarding the appropriate number of participants, but believes this high level of continued participation in the bottom longline fishery may still be too great to sufficiently reduce turtle bycatch and other impacts from bottom longline fisheries.

+ Alternative 4 (*Reduce the number of participants to 61: NOAA Preferred*): This alternative would reduce the number of qualifying participants to 61, based on a history of 40,000 pound landings, which is the preferred level by NOAA identified in the DEIS. EPA will defer to NOAA and the Council that this is a reasonable number of participants, although we also request consideration to include "reliant" longline fishers discussed in Alternative 7 within the 61 participants, from a societal perspective.

+ Alternative 5 (*Reduce the number of participants to 39 or 45*): Alternative 5 would reduce the number of qualifying participants even further to 39 or 45 (depending on the timeframe used), based on a 50,000 pound landings criterion. This number of participants is less than preferred by NOAA and the Council; however, it does not appear unreasonable for the purposes of reducing turtle bycatch. If such a relatively low number of participants is implemented, we again suggest that inclusion of those fishers reliant on longline fishing should be considered consistent with Alternative 7.

+ Alternative 6 (*Reduce the number of participants to 22 or 31*): This alternative would reduce the number of eligible participants to the smallest number presented in the DEIS of 22 or 31, depending on the dataset used and a 60,000 pound landings history. This number of participants is much less than preferred by NOAA and the Council and may be an unnecessarily low number of participants for turtle bycatch reduction. It is also less than the number of reliant participants listed for Alternative 7.

+ Alternative 7 (*Reduce the number of participants to 44 or 36*): This alternative considers the number of fishers reliant on the longline fishery (i.e., those fishers with at least 15% of their ex-vessel landings being red grouper: pg. 30). EPA again defers to NOAA and the Council, but notes that these 36-44 fishers and their communities should be considered for inclusion within the final number of qualified participants in the above alternatives to minimize societal issues, particularly if any EJ fishers are also reliant. Alternatively, other gear (vertical lines) or other local fisheries could perhaps be substituted if these reliant fishers do not continue as longline participants.

Alternative 7 also addresses the transferability of endorsements. EPA does not support endorsement transfers to help reduce the fishery when fishers cannot or do not wish to further participate and offer to transfer their endorsement. We note that NOAA's preference is Sub-Option iii, where transference could only be to a fisher vessel of equal or lesser length. We agree that such transfers would not increase the fishery, but they would also not reduce it – which is the goal of Amendment 31 as it relates to a turtle bycatch reduction.

*** Action 4 – Modify Fishing Practices and Gear for vessels using bottom longline gear to harvest reef fish east of Cape San Blas.**

+ Alternative 1 (*No Action*): This alternative would allow current bottom longline fishing practices to continue throughout the eastern Gulf. EPA does not support this alternative inasmuch as the bycatch of turtles is currently greater than the 2005 BioOp allows. We agree that the mainline length, number of hooks and gangion (leader) length of longline gear should be modified under action Alternatives 2-4 to reduce the fishery and in turn turtle bycatch.

+ Alternative 2 (*Limit mainline length*): This alternative would reduce the mainline length of longlines to 1, 2, 4 or 5 nautical miles (nm). Data (albeit limited data) show that no turtles were hooked when lines averaged 5.3 nm long while turtles were hooked when lines averaged 6.7 nm. However, the number of longline sets in this study were greatly different for the two datasets, with the no turtle bycatch sets numbering only 12 sets. Nevertheless, given these limited data and the fact that shorter mainlines could result in earlier retrievals, which in turn implies a closer correlation with maximum turtle underwater survival times, could translate into less lethal takes. Accordingly, EPA prefers shorter set lengths of 1-2 nm. Shorter mainlines may secondarily also limit the overall harvest of reef fish which could be beneficial to target species (unless greater effort is expended by the fishers by setting more of the shorter sets). Overall, we defer to NOAA and the Council regarding a reasonably short mainline length that will reduce turtle bycatch.

+ Alternative 3 (*Limit number of hooks*): Alternative 3 proposes to limit the number of hooks to 500, 750/1,000 or 1,500. As indicated above for Alternative 2, EPA prefers shorter mainline lengths which implies less hooks and lowers the chance for turtle bycatch. We favor Option a or b with 500-750 rigged hooks.

In addition to the number of hooks, the FEIS should also consider the type of hooks used. The use of circle hooks or hook guards could reduce turtle bycatch and could be sized to be large enough to physically prevent turtle capture. Although circle hooks are not popular for recreational fishers, passive longline fishing would seems ideal for circle hooks because fish set the hook themselves by swimming away. Overall, we defer to NOAA and the Council regarding a reasonable number of rigged hooks that will reduce turtle bycatch and the potential use of circle hooks or hook guards.

+ Alternative 4 (*Limit gangion length*): This alternative limits the length of the leader of the bottom longline gear. Limited information exists regarding the advantages of a long or short leader line. However, some data suggest that shorter gangion lengths of 4 feet catch fewer turtles. Currently, only 13% of the longliners use 4-ft leaders.

Summary

EPA supports the reduction of sea turtle bycatch in the bottom longline Reef Fish Fishery proposed by Amendment 31. Assuming existing data adequately demonstrate that turtles prefer squid over fish baits and any societal issues associated with switching to non-squid baits are manageable, EPA prefers Alternative 2 for Action 1, which would prohibit the use of squid bait. If data are inconclusive, we suggest the prioritization of further studies by onboard observers to generate reliable data since changing bait types would appear to be a relatively simple method to reduce turtle bycatch when compared to changing the more substantive fishing practices and gear considered in Actions 2-4.

Actions 2-4 consider changes in longline fishing locations and depths (Action 2), the number of fishery participants/vessels (Action 3), and gear specifications (Action 4). Overall, we support the downsizing of the bottom longline fleet and fishing effort through area and time closures, permit endorsements and gear restrictions since these in turn can be expected to also reduce the level of turtle bycatch in the bottom longline reef fishery consistent with Amendment 31. EPA defers to NOAA and the Council regarding specific quantifications for these actions to reduce the fishery. However, for Alternative 3 of Action 4, we recommend that not only the number of rigged hooks be considered but also the kinds of hooks, such as circle hooks and hook guards that are sized to physically prevent most turtles from swallowing hooks. Secondarily, we also note that downsizing might also reduce the overall fishing effort of the Reef Fish Fishery and thereby reduce the fishing pressure on stressed reef fish stocks such as snapper.

In addition to the four actions considered in the DEIS, we believe that the length of soak times, timing (time of day) of making sets, potential turtle repellants and cumulative effects of reef longlines should also be considered to further reduce turtle bycatch. Moreover, if reduced endorsements (Action 3) would displace longline fishers in order to limit the size of the fishery, additional studies on the effects of replacement gear (e.g., vertical lines) should be conducted for comparison against bottom longline effects. Although reducing turtle bycatch (particularly lethal takes) is the purpose of Amendment 31, the societal effects of displacing commercial bottom longline fishers should also considered (particularly any EJ fishers and/or reliant longliners).

Although the DEIS contains an improved EJ section over previous fishery EISs, it is unclear if any EJ fishers would be affected since no public outreach to fishing communities was apparently provided. Future EISs (preferably also the FEIS for the present EIS) should provide such EJ information since U.S. Census data only provide community demographic data rather than specific fisher demographics. Although it is unclear if EJ fishers exist in the reef fishery bottom longline fleet, it is clear from Alternative 7 of Action 3 that reliant fishers exist. These should be considered in terms of final rulemaking and mitigative offsets.

EPA DEIS Rating

EPA rates this DEIS as an "EC-2". Although we strongly support the use of fishery management measures to reduce sea turtle bycatch, we recommend that NOAA's preference for Alternative 1 (Action 1) in the DEIS to not prohibit squid bait be re-considered and/or confirmed through additional studies. In addition, bycatch reduction information should be provided in the FEIS on the effects of circle hooks and hook guards; use of vertical lines; survival rates of released live turtle discards, and on longline soak times, timing (time of day) of making sets, and potential turtle repellants.

We appreciate the opportunity to review the DEIS. Should you have questions regarding these comments, feel free to contact Chris Hoberg of my staff at 404/ 562-9619 or hoberg.chris@epa.gov.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

Enclosure: *Additional Comments*

cc: Dr. Paul N. Doremus – NEPA Coordinator (NOAA): Silver Spring, MD

ADDITIONAL COMMENTS

* *Table 1.1.1* – This table (pg. 2) presents the anticipated 2005 BioOp total (and lethal) turtle takes over a three-year period. These were: 203 (78) loggerheads, 51 (21) greens, 44 (13) hawksbills, 20 (9) leathernecks, and 3 (1) Kemp's ridleys. However, actual takings during this timeframe exceeded these predictions. The FEIS should clarify the basis for which these predictions were generated.

* *Scoping Hearing* – Based on the summary of the public scoping hearing (pg. 227 of the DEIS and on the internet), it is unclear if vertical lines hook less or more sea turtles than bottom longline gear. Data ranging for most years between 1993 to 2008 presented at the hearing were inconclusive, with vertical lines showing less takes in some instances and more in others. However, results may have been influenced by bait type, soak times and various other factors. To the extent that Amendment 31 may result in some bottom longline fishers switching to vertical line gear (Action 3), the FEIS should further compare the impacts of these two gear types relative to turtle bycatch to the extent data are available or can be generated.

* *Longlines vs. Vertical Lines* – In general, EPA prefers vertical lines since their soak times are less than bottom longlines (internet) and they could be better timed to fish for an hour or less (i.e., within turtle maximum underwater survival times to reduce drownings); have less chance of attracting and hooking sea birds in surface waters when sets are made since lines are set individually; need not damage bottom habitat due to the line itself (but frequent vessel anchoring could damage the seafloor); and require more fishing effort than longlines (the catch-per-unit-of-effort may be reduced which secondarily helps in reef fish stock recoveries). Vertical lines can be expected to continue to incidentally catch turtles, but ideally will result in less lethal takes (drownings). The need for, frequency and reef effects of anchorings to set and retrieve vertical lines should be discussed in the FEIS. Do vessels necessarily need to anchor or can they stay on station under engine power?

* *Environmental Justice (EJ)* – We appreciate the demographic data presented in Table 4.1.1 (pg. 72) and elsewhere in the DEIS. However, specific information regarding fishers in the reef fish bottom longline fleet was not found (pg. 87). Understandably, such information is difficult to obtain and is more specific than block group information of U.S. Census data for communities, counties and states.

In such instances, we recommend (as we have in recent past NOAA fishery EIS comments) public outreach to determine the level (if any) of EJ populations within the fleet that may be impacted by societal effects expected to result for Amendment 31. If such demographic information is considered "confidential" (as suggested in the NOAA FEIS for the Comprehensive Ecosystem-Based Amendment 1: CE-BA 1), we recommend that it be "defused" by only disclosing if most of the fishers are or are not minorities and/or low-income populations, i.e., a potential EJ population. Moreover, as suggested in CE-BA 1, if fisher demographic information is considered "confidential", public outreach could also be used to encourage comments relative to demographic needs at NOAA's public hearings and meetings on amendments and rulemaking. The FEIS should discuss this approach and how it compares to NOAA's mandate to considering fisher societal impacts pursuant to the reauthorized Magnuson-Stevens Fishery Conservation and Management Act. Such a mandate would likely be broader than EJ demographics and extend to all impacted fishers.

Page 88 states that "...adverse social and economic consequences are expected to accrue to fishermen in the reef fish bottom longline fleet and associated industries and communities due to the reduction of expenditures and revenues associated with the expected change in fishing behavior and harvest levels...". While such impacts can often be expected from Fishery Management Plans (FMPs) and Amendments that reduce the size or capital of a fishery in order to restore the resource, societal effects – particularly to any affected EJ fishers – should be considered for potential offsets.

* *Studies* – As is often the case, additional studies would be helpful, if not necessary, in several areas addressed by Amendment 31. These include the relative turtle bycatch from bottom longline versus vertical line gear; turtle bait preferences including testing squid versus fish and a review of current baits being used by bottom longliners (e.g., 43% of the bait used in the example on page 16 was "unknown"); potential use of circle hooks or other modifications that are sized to preclude or reduce most turtle hookings but not preventing capture of target species; the advantages of long or short gangions relative to turtle bycatch; and the survival rates of live turtles released (discards) after hook-and-line capture as well as any sublethal effects. Are any of these topics already being studied or planned/budgeted for study by NOAA or Gulf universities? The expanded use of onboard observers could also establish a better baseline for turtle bycatch.

* *Cumulative Effects* – EPA appreciates the extensive cumulative effects analysis on page 167 of the DEIS. We also appreciate the complementary section regarding the history of previous related amendments (pg. 6). For the FEIS, we suggest a comparison of the cumulative effects of bottom longline versus vertical line gear impacts relative to bycatch, disturbance of reef bottom habitat, ghost fishing and entanglement by lost gear, etc.

* *Diagrams* – For the average reviewer, inclusion of diagrams depicting bottom longline gear and vertical line gear in the FEIS would be beneficial. This diagram should be labeled, including 'gangions' and other terms used in the DEIS.

* *Gear Modification* – Hypothetically, could longlines or vertical lines be modified to allow hooked air breathers like turtles to surface and survive until lines are retrieved? That is, could a sliding hook mechanism perhaps be designed where hooked turtles could "slide" up a line in the water column to the surface, while non-air breathers like fish would tend to remain below? Such a setup may not reduce turtle bycatch but could reduce turtle drownings and increase live discards.

* _List of Acronyms_ – The List of Acronyms could be more inclusive in the FEIS. For example, the acronym 'RFEM' (Reef Fish Electronic Monitoring) should be included in the List of Acronyms of the FEIS.

* _Glossary_ – Although a List of Acronyms was included, the reviewing non-fisher public would benefit from the inclusion of a Glossary of Terms in the FEIS. This glossary should include terms like 'gangion', 'vertical lines', 'bottom longlines' and 'endorsements' used in the DEIS with which public reviewers may not be familiar.

APPENDIX E -- COMMENTS RECEIVED ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR AMENDMENT 31 TO THE FISHERY MANANGEMENT PLAN FOR REEF FISH RESOURCES OF THE GULF OF MEXICO (Reef Fish FMP), INCLUDING RESPONSES.

Comments were received from the Environmental Protection Agency and six additional individuals, agencies or groups. All comments received are posted to Federal e-Rulemaking Portal (http://www.regulations.gov, docket number: **NOAA-NMFS-2008-0310**).

Comment: A frequent dilemma in fishery management regulations is whether or not to issue rulemaking or perhaps delay if the level of information is not sufficient. The Environmental Protection Agency (EPA) commented the it appears shorter mainline lengths of 1-2 nautical miles, shorter gangions, a requirement for circle hooks, especially if of a size that would physically prevent turtles from being hooked, soak times, timing (time of day), potential turtle repellants, and a prohibition of squid for bait would reduce turtle takes. The EPA defers to NOAA and the Gulf of Mexico Fishery Management Council (Council) regarding the adequacy of data for these options, but the final EIS (FEIS) should reconsider prohibiting squid for bait, and discuss the effects of circle hooks and hook guards, alternative use of vertical lines, survival rates of released turtles, and the benefits of longline soak times, timing of sets (time of day), and potential turtle repellants. The public comments also addressed the effects of gear modification and fishing behavior.

Response: The National Marine Fisheries Service (NMFS) and the Council do not have the opportunity to wait for better information before taking action to reduce sea turtle takes in the bottom longline component of the reef fish fishery of the eastern Gulf of Mexico. The Endangered Species Act (ESA) mandates action once the incidental take authorized by a biological opinion is exceeded, including re-initiation of a section 7 consultation. The ESA and its implementing regulations are clear that a federal action agency must use the best scientific and fishery data available for both the formal consultation process and to ensure its action will not jeopardize the species. In assessing the affects of the proposed action, NMFS must resolve uncertainty by giving the benefit of the doubt to threatened and endangered species.

NMFS does not necessarily agree that gear and bait changes are certain to reduce takes. Having less gear in the water at any one time may not reduce overall sea turtle takes. By having shorter mainlines, gear retrieval would be shorter and more sets could be made per day. In regard to the specific suggestions concerning gear reductions, as is pointed out on pages 38-43, mainlines of less than 4 miles represent less than 5 percent of the observed gear configurations. With such a limited sample size, a rare event such as a turtle take is not likely to be documented. As to shorter gangions, Figure 2.4.3 and 2.4.4 on page 42 illustrate there is little difference in the gangion length and ability to take turtles. Gangions 4 feet in length are only used by only 13 percent of the fleet (Figure 2.4.4), but their use is associated with 33 percent of all observed turtle takes (Figure 2.4.3), thus representing a larger proportion of the total takes by gangions of that length. In regard to using circle hooks, the Regulatory History on page 11 and discussions in the Bycatch Practicability Analysis on page 94 note that circle hooks were required in the reef fish fishery when using natural baits through implementation of Amendment 27 to the Reef Fish FMP in 2008. The majority of turtles taken by bottom longlines are adult loggerhead sea turtles. Using a circle hook large enough to physically preclude a large turtle from being taken would also preclude all but the largest grouper from being caught. Information is not available to determine if hook size or hook guards are practical alternatives. Finally, NMFS agrees there is documentation that sea turtles may prefer squid for bait, based on observations in other fisheries. As noted in the DEIS, approximately 38 percent of all takes occurred when squid was used as bait; however, the take rate of sea turtles on squid bait may be an artifact of squid being the predominant bait used in the fishery, thus there is simply a greater probability of a sea turtle encountering squid bait than other types of bait. Information specific to the quantitative reductions of sea turtle interactions from a change of bait type is not available. In addition, as noted in the amendment, turtles were taken on both squid and fish (including skate and shark bait, which would be a non-natural food for sea turtles), and bait type was not recorded for nearly half the observed takes. With a total take of only 21 sea turtles over a three-year period, there is little statistical validity to any comparison with gear changes and the resulting effects of reducing turtle takes. Nevertheless, NMFS agrees that gear, bait, and fishing technique changes could possibly reduce turtle takes. However, takes occur over such a small percentage of the total effort, thus the available information does not provide any quantitative measure of a level of reduction that could be achieved by any one or any group of these types of actions. Additional future research might provide an indication of the value of these gear modifications, and there may be some turtle repellant designed in the future, but without some quantitative documentation of the effectiveness of gear, bait, and fishing technique changes, the Council chose not to select these actions as preferred procedures.

Comment: The EPA commented that the FEIS should make it clear if vertical lines hook less turtles than longlines and should compare the impacts of these two gears relative to turtle bycatch to the extent data are available. In addition the FEIS should clarify the basis for the incidental take estimates developed in the 2005 Biological Opinion, as listed in Table 1.1.1 on page 2.

Response: NMFS clarifies available observer data indicate vertical lines hook less turtles than longlines. To date, despite similar observer coverage levels in the vertical line and bottom longline components of the Gulf reef fish fishery, sea turtles have only been observed hooked on bottom longline gear. In January 2008, a loggerhead sea turtle was entangled in the leader of a bandit reel. This is the only record of sea turtle bycatch observed in the vertical line component of the Gulf reef fishery. It was not hooked and was untangled by the captain and released uninjured (Dr. Scott-Denton, NMFS Galveston Laboratory, pers. comm.). NMFS also clarifies that the incidental take estimated in the 2005 Biological Opinion was based on extrapolation of sea turtle bycatch and fishing effort logbook data from July 2001 through August 2004.

Comment: Vertical line fishing should have less interaction with sea turtles, and greatly reduced mortalities because the soak time for the baits is less. However, given that the DEIS indicates non-qualifying longline fishermen are likely to switch to vertical gear, and given the majority of the fleet consists of vertical line vessels, the EPA commented that the FEIS should discuss and compare the effects of vertical line fishing to bottom longline fishing relative to bycatch, habitat, and issues such as lost (ghost) gear.

Response: The impacts on bycatch are mentioned in the Fishery Impact Statement: *"For example, vertical line gear has also been documented to have a greater catch-per-unit effort of some fish species currently in rebuilding plans (e.g., gray triggerfish and greater amberjack) as well as other reef fish, such as gag, which is in overfished status."* These discussions are expanded in Section 5, noting that with a conversion of non-qualifying longline vessels to vertical line vessels, there may be an increased effort and catch of regulatory discards, such as the overfished gag. However, as is noted in the biological impacts sections for each action, it is unknown exactly how many vessels will convert, thus the impacts to bycatch can only be qualitatively evaluated.

Comparisons of impacts to habitat between vertical line and bottom longline fishing are discussed in the Fishery Impact Statement, and in Section 6.2.1, beginning on page 105. The principal components of the bottom longline that can produce seabed effects are the anchors or weights, hooks, and the mainline. When a vessel is retrieving a bottom longline it may be dragged across the bottom for some distance. This could have a habitat effect, especially when the gear is employed in the vicinity of complex vertical habitat such as sponges, gorgonians, and corals. As noted in Section 6.2.1, some species targeted by longlines, such as halibut, are large enough to drag a set line for some distance. However, longline gear in the Gulf of Mexico is substantially lighter (often with monofilament mainlines), and the targeted species are not large enough to drag the gear. Vertical line vessels tend to anchor more, and may cause more damage to sensitive bottom habitats than the effects of longline gear itself. Additional impacts may include entanglement and minor degradation of benthic species from line abrasion and the use of weights.

Lost or abandoned vertical line and bottom longline gear potentially can result in ghost fishing, where the line floats free and can catch fish, sea turtles, and marine mammals until all the bait is gone, unless the caught organisms themselves become bait. Gear sometimes becomes lost because of weather or accidents, and may be abandoned by fishermen in closed areas trying to avoid detection by enforcement. Cumulative effects of lost gear could be significant. Retrieval of lost or abandoned longline gear typically occurs by dragging a grappling hook across the bottom to snag the line, which can cause severe local damage to fragile habitat such as coral. The magnitude of the potential problems from lost gear has not been evaluated in the Gulf of Mexico. Discarded or lost fishing line (both from recreational and commercial vertical line fishing) can entangle on branching and digitate corals and lead to progressive algal growth. This subsequent fouling eventually overgrows and kills the coral, becoming an amorphous lump once accreted by coralline algae. Lines entangled amongst fragile coral may break delicate gorgonians and similar species.

Comment: Unlike Alternatives 3-7 for Action 3, the number of reduced participants associated with Alternative 2 is unspecified in the DEIS. The EPA commented that the FEIS should reflect the number of participants for comparison.

Response: On page 30, the DEIS text includes the following statement: "*Alternative 2 would result in 117 and 118 longline endorsements for 1999-2007 and 1999-2004, respectively. For the 1999-2007 time period, qualifying permits would represent 39.4% of permits landing reef fish using fish traps or longline gear and account for 85.9% of the reef fish landings*." The number of participants for each alternative is also identified in comparative form in Tables 2.3.1 and 2.3.2 on page 31 of the DEIS.

Comment: The DEIS indicates the majority of sea turtles are taken in June through August, increasing the probability of an interaction. An analysis of satellite tracking data by both Mote Marine Laboratory and Florida Fish and Wildlife Commission indicates loggerhead sea turtles are present throughout the year on the West Florida continental shelf in all depths where the bottom longline component of the reef fish fishery operates. Therefore, it is doubtful that a temporal restriction would alleviate or minimize any bycatch take of loggerhead sea turtles in a substantive way. The public commented that NMFS should implement regulations to sharply control longline fishing in the eastern Gulf of Mexico, using endorsement qualifiers of 50,000 or 60,000 pounds, and restrict bottom longline fishing to depths greater than 50 fathoms.

Response: The preferred actions selected by the Council in Amendment 31, and analyzed in the DEIS, are intended to balance the continued operation of the bottom longline component of the reef fish fishery in the eastern Gulf of Mexico while maintaining adequately protective measures for sea turtles. The preferred options establish gear modifications, a June through August season-area closure, and a restrictive endorsement program anticipated to reduce the longline fleet by nearly 50 percent. The combined effects of these actions are anticipated to achieve between 48-67 percent reductions in effective bottom longline fishing effort, depending on the level of vessels that exit the fishery or convert to vertical line gear. NMFS acknowledges that sea turtles are documented throughout the continental shelf waters along Florida's west coast, as illustrated by recent research efforts to satellite-tag and track sea turtles in the area. However, these data indicate only presence-absence. The best scientific information available to NMFS and the Council to quantitatively assess the seasonal distribution and density of loggerhead sea turtles over the West Florida continental shelf comes from aerial surveys conducted by the Southeast Fishery Science Center. Those data reveal a significant decrease in density of loggerhead sea turtles with increasing depth during the summer months. NMFS and the Council chose their preferred options for a time-area closure after consideration of the satellite-tag, fishery observer, and aerial survey information on turtle distribution and density on the West Florida continental shelf.

Comment: The EPA commented that the societal effects of the proposed action should be better discussed in the document. For example, disallowing fishing along specific coastlines should be considered, especially in regard to environmental justice (EJ) concerns. There should be consideration of the impacts on "reliant" fishermen, as identified in Alternative 7, within the 61 participants identified through the preferred alternative.

Response: While the amendment does address EJ issues, perhaps further explanation will assist in answering questions raised about the alternatives and their impacts on EJ fishers. EJ issues are indirectly discussed in the Fishery Impact Statement, the Social Impact Statement, and under the social impacts discussions for each alternative. Because NMFS is mandated to consider the impacts upon fishing communities and has conducted research to identify and define them, much of the impact analysis is focused at that level. NMFS agrees there are problems with using census data to determine the extent that there may be EJ issues within a community. One of those is that census data at the community level most often needed for fishery management are frequently dated to the last decennial census which is close to ten years old. This is due to the fact that the most recent census estimates are for geographic areas larger than many fishing communities. For that reason, county level data were examined to ensure the most recent census data were included. Furthermore, as outlined in Section 4, the process of gentrification has been occurring along the Florida east coast, within in many of the communities identified, which has the ultimate effect of displacing EJ populations. As discussed, many of the participants within this fishery no longer are able to live within the fishing community per se and have been dispersed throughout the county to areas where the cost of living is far less than on the waterfront. Nevertheless, the primary focus of activity with regard to community takes place at the fish houses which do have geographic locations within the identified fishing communities; therefore, the analysis attempts to include both geographic levels.

Community level analyses and discussions, as done in Section 6.3.4 beginning on page 144, cannot, at this time, be examined in finer detail than the community level. NMFS does not conduct a census of fishers and there has been little detailed research conducted within the longline fishery since the 1990s. However, past research has indicated that most individuals who participate in the reef fish fishery are middle aged males, according to Waters (1994)[15]. Although there has not been any recent research into the demographic character of longline fishers, by far the majority of captains and crew are white non-Hispanic. Recent research conducted among North Carolina fishers provides a demographic description that is typical of most fisheries within the southeast, with the possible exception of the Gulf of Mexico shrimp fishery or some fisheries in the Keys and identifies the majority of participants as white, middle-aged males (Cheveront 2003)[16].

Household income levels among participants in this fishery vary considerably with less than half of that income coming from commercial fishing for the average household according to Waters (1994), which is the most recent research to include estimates of household income. In that research there were 14 percent of participants reporting household income levels of less than $10,000, however income levels and household size were not analyzed to determine where those levels would fall within poverty guidelines. Again, because the participants are primarily located within the county, county wide census statistics were used to determine poverty thresholds that were the most current.

Although some minorities do participate in the fishery and work in fish houses, it is assumed that they would not be impacted disproportionately as they do not seem to be concentrated within a particular community nor a specific sector of the fishery. As many of these individuals do not live within the community itself, county level data provided the most up-to-date assessment in terms of EJ thresholds.

With regard to reliant fishers, the preferred alternative was selected to provide continued participation to reliant fishers and still meet the mandated reduction of sea turtle takes. As mentioned previously, much of the analysis was focused upon reliant communities. While the preferred alternative does provide for the continued participation of reliant fishers in the longline fishery, the continued participation of reliant fishing communities is partially tied to the conversion to vertical line fishing gear by former longline vessels. As noted in the discussions of why **Alternative 7** was not selected as a preferred, such a distinction of a reliant community may raise fairness and equity issues by excluding permit owners who meet the landings requirement of the **Preferred Alternative 4**, but who do not live in one of the targeted fishing communities.

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[15] Waters, James R. 1996. An Economic Survey Of Commercial Reef Fish Vessels In The U.S. Gulf Of Mexico. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 101 Piver's Island Road, Beaufort, NC 28516.

[16] Chevront, Brian. 2003. A Social and Economic Analysis of Commercial Fisheries in North Carolina: Beaufort Inlet to The South Carolina State Line. Division of Marine Fisheries. North Carolina Department of Environment and Natural Resources, P.O. Box 769, Morehead City, NC 28557-0769

Finally, many of the impacts of these actions may be mitigated with a conversion to vertical line fishing gear as discussed under the alternatives. If that transition is successful, the societal impacts may be minimal. As mentioned in the analysis, monies have been provided to assist with this conversion. Unfortunately, at this time, we do not know how successful that transition has been as many of the conversions have not been completed.

RECORD OF DECISION

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

AMENDMENT 31 TO THE FISHERY MANAGEMENT PLAN (FMP) FOR REEF FISH

RESOURCES OF THE GULF OF MEXICO

National Marine Fisheries Service
Southeast Region
St. Petersburg, Florida

Decision and Reasons for the Decision

This Record of Decision (ROD) documents the determination by NOAA's National Marine Fisheries Service (NMFS), on behalf of the Secretary of Commerce (Secretary), to approve Amendment 31/Final Environmental Impact Statement (FEIS). The subject amendment contains measures to balance the continued operation of the bottom longline component of the reef fish fishery in the eastern Gulf of Mexico (Gulf) while maintaining adequate protective measures for sea turtles. The actions in Amendment 31 resulted from the findings of a recent observer study by the NMFS' Southeast Fisheries Science Center (SEFSC) which estimated hardshell sea turtle takes by the commercial bottom longline component of the Gulf reef fish fishery have exceeded the three-year anticipated take levels in the 2005 Biological Opinion (BiOp). The 2005 BiOp authorized 113 hardshell sea turtle takes by the bottom longline component of the reef fish fishery over a three-year period to account for the variability in the hardshell sea turtle takes between years. Twenty-one hardshell sea turtle takes were observed in the eastern Gulf bottom longline component of the reef fish fishery over a 30-month period. By extrapolating the 2006-2008 hardshell sea turtle take data to the overall effort of the fishery, the most recent bycatch report estimated the number of takes by the bottom longline component of the reef fish fishery to be 967 (95 percent confidence interval (C.I.) 463-2,020) for the time period.

To address this issue, the Gulf of Mexico Fishery Management Council (Council) and NMFS developed management measures to reduce hardshell sea turtle takes by the bottom longline component of the reef fish fishery. Because the estimated sea turtle takes were determined essentially by multiplying the rate of sea turtle take by overall fishing effort, and no methods have yet been demonstrated effective at reducing the rate of sea turtle takes in the gear, fishing effort must be decreased to reduce the sea turtle takes. There is some benefit gained from the geographic redistribution of effort from areas of higher sea turtle concentration to areas of lower sea turtle concentration, but most of the anticipated reduction in sea turtle takes results from the reduction in fishing effort. The reduction of fishing effort involves reducing the harvest of reef fish by bottom longline gear which has an obvious adverse affect on this component of the fishery. The preferred alternatives establish gear modifications, season-area closures, and a restrictive endorsement program to allow continued participation in the bottom longline component of the commercial reef fish fishery. The combined suite of preferred alternatives represents the Council's and NMFS' determination of the optimal balance between conserving sea turtles and allowing the continued operation the bottom longline component of the fishery.

These measures are in accordance with the procedures prescribed in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). This ROD is issued pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) NEPA regulations at 40 CFR Parts 1500-1508, and NOAA's Administrative Order NAO 216-6, Sections 6.03(a)(2) (Consolidated NEPA Documents, Management Plans and Plan Amendments), and 6.03(d)(2) (Fisheries Actions that Require an Environmental Impact Statement (EIS)). The decision to approve Amendment 31 is based on the complete administrative record, including the biological opinion, public comment, analyses in the final EIS prepared in association with this action and in accordance with NEPA, and other supporting analyses.

Background

In September 2008, NMFS released a report analyzing sea turtle takes by the bottom longline component of the Gulf reef fish fishery as documented by an observer program. Subsequently updated in April 2009, the report indicated that the number of hardshell sea turtle takes by the bottom longline component of the Gulf reef fish fishery had far exceeded the incidental take estimates specified in a 2005 BiOp. On September 3, 2008, NMFS reinitiated Endangered Species Act (ESA) section 7 consultation on the reef fish fishery. In addition, at the January 2009 meeting, the Council requested NMFS to develop an emergency rule to reduce number of hardshell sea turtle takes by the bottom longline component of the reef fish fishery in the short-term while the Council developed long-term measures through Amendment 31 and associated EIS.

On November 25, 2008 (73 FR 71605), NMFS published a Notice of Intent (NOI) in the *Federal Register* to prepare a draft EIS and to announce scoping meetings regarding the actions proposed in Amendment 31. Amendment 31 was developed to describe and analyze alternatives to reduce the interactions of the reef fish fishery with hardshell sea turtles in accordance with the Magnuson-Stevens Act and the ESA.

While the Council was considering long-term measures to reduce sea turtle bycatch, short-term action was needed to significantly reduce bycatch until the long-term measures could be implemented. Therefore, the Council requested NMFS take emergency action to achieve these short-term reductions. In an emergency rule, NMFS prohibited longline fishing for reef fish in the eastern Gulf inside of 50 fathoms, and prohibited all bottom longline fishing for reef fish in the eastern Gulf after the deepwater grouper and tilefish commercial quotas were filled. This emergency rule was implemented May 18, 2009. Subsequently, at the August 2009 meeting, the Council approved long-term measures in Amendment 31 to reduce bycatch of hardshell sea turtles, particularly loggerhead sea turtles, in the bottom longline component of the eastern Gulf reef fish fishery. The preferred actions consist of a depth-area closure to the use of bottom longline gear to fish for reef fish shoreward of a line approximating the 35-fathom contour during June through August, a hook limitation of 1,000 hooks per bottom longline reef fish permitted vessel with no more than 750 rigged for fishing at any given time, and a 40,000-pound qualification endorsement based on landings accrued during the 1999-2007 period. These actions are estimated to reduce the bycatch of sea turtles and the overall bottom longline fishing effort for reef fish by 48 to 67 percent relative to the 2007-2008 baseline effective effort levels.

In October 2009, NMFS completed a BiOp on the continued authorization of the Gulf reef fish fishery, as managed under the FMP. The BiOp considered all Reef Fish FMP amendments implemented to date, as well as the actions included in an ESA rule and proposed in Amendment 31. The BiOp concluded that the continued authorization of the Gulf reef fish fishery was likely to adversely affect sea turtles and sawfish, but was not likely to jeopardize the continued existence of any listed species. An incidental take statement (ITS) was issued specifying the amount and extent of anticipated take on a three-year basis, along with reasonable and prudenet measures and associated terms and conditions deemed necessary and appropriate to minimize the impact of these takes.

Based on the conclusion of the BiOp and an environmental assessment prepared for the regulation, NMFS implemented an ESA rule on October 16, 2009, to replace the existing emergency rule before it expired on October 29, 2009. The ESA rule prohibits bottom longline fishing in the eastern Gulf for reef fish in waters shoreward of a line approximating the 35-fathom contour with a restriction of 1,000 hooks per reef fish longline vessel with no more than 750 hooks rigged at any given time. The ESA rule will remain in effect until the long-term measures in Amendment 31 or other regulations are implemented.

The Council submitted the Final Amendment 31 to NMFS on September 9, 2009. The range of actions and alternatives considered in the draft EIS (DEIS) for Amendment 31 were based on information derived from two scoping meetings held by the Council from December 9-10, 2008, and six public hearing meetings held from May 26, 2009, through June 8, 2009. Further input was provided through the Council's public hearing comment process prior to submission of the amendment. The DEIS filed with the EPA on November 6, 2009. The 45-day comment period for the DEIS ended on December 28, 2009. Comments received on the DEIS were addressed in the FEIS. Comments on the DEIS were received from the Environmental Protection Agency (EPA) and six additional individuals, agencies, or groups. A notice of availability (NOA) for Amendment 31 was published in the *Federal Register* on December 31, 2009 (74 FR 69322). The proposed rule published in the *Federal Register* on January 15, 2010 (75 FR 2469). The FEIS filed with the EPA on January 29, 2010. The comment period for the proposed rule and the amendment ended on March 1, 2010.

Some public comments submitted in response to the proposed rule and notice of availability for Amendment 31 assert that the status quo with regard to the use of bottom longline gear in the reef fish fishery has changed from what is analyzed under the no action alternative in the FEIS for Amendment 31. The no action alternative in the FEIS is the status quo that existed at the time the Council voted to submit Amendment 31 for Secretarial review, approval, and implementation. Under the status quo, no restrictions exist that specifically limit interactions with sea turtles by the longline component of the fishery. On October 16, 2009, subsequent to Council submission, NMFS implemented a rule under the authority of the ESA that established some of the measures contained in Amendment 31, as well as modified measures from Amendment 31; i.e., a year round closure inside 35 fathoms rather than a seasonal closure for the area. Although the ESA rule contains no express expiration date, the preamble to the rule clearly established that the rule was intended as an interim step in implementing Amendment 31, or some other alternative long term measures. The ESA rule would be replaced in the event of approval and implementation of Amendment 31. Also, the interim ESA measures currently in place were addressed as a reasonably foreseeable future action in the cumulative effects analysis contained in the FEIS. As the comments suggest, this could be viewed as a changed baseline, which means the impacts of the alternatives in Amendment 31 are actually less than they are when compared to the prior baseline represented by the no action alternative in the FEIS.

NMFS appreciates this concern, but believes the impacts analysis in the FEIS contains the requisite hard look at the impacts of the action relative to both the status quo as defined in the FEIS and the existing ESA rule. Under the commenter's view, the baseline would have changed in a way so as to lessen the adverse impacts of and on the social and economic environments, as well as the benefits to the physical and biological environments. However, the impacts that would be directly attributable to Amendment 31, and not the interim measures implemented pursuant to the ESA, fall within the range of the impacts analyzed in the FEIS. To state it differently, the impacts directly attributable to Amendment 31 could be viewed as a subset of the impacts analyzed in the FEIS, because some of the impacts predicted in the FEIS would have already occurred as a result of the interim ESA measures. However, upon implementation of Amendment 31, the ESA-based interim measures will be terminated, and all such impacts will then be directly attributable to Amendment 31. This is consistent with the approach outlined in the preamble to the ESA rule, Amendment 31, and the BiOp on the fishery. Accordingly, NMFS has determined it is unnecessary and inappropriate to delay action to change the no action alternative and reanalyze the impacts of Amendment 31 in light of that potentially changed baseline. The FEIS adequately informs the agency and the public of the potential impacts of the proposed action in light of existing impacts in the fishery, and as such, the agency believes it is in compliance with applicable law.

Controversy

NMFS has received comments from a broad spectrum of user- and interest-groups, as well as various government officials. Several non-governmental organizations and a substantial number of citizens have indicated action is necessary to protect sea turtles. Although supporting protection of sea turtles, the fishing industry, several members of Congress, and the Governor of Florida have expressed concerns about the potential impacts to the fishing industry and the commercial fishing infrastructure along the west coast of Florida, should overly restrictive measures be implemented. On April 15, 2009, several environmental groups filed suit in federal court in Gainesville, Florida, challenging the ongoing operation of the bottom longline component of the Gulf reef fish fishery. On November 17, 2009, the court entered an order dismissing the case in response to a joint stipulation of dismissal; however, plaintiffs filed a 60-day notice of intent to sue under the ESA on December 16, 2009, regarding the recently completed 2009 BiOp. On December 18, 2009, the plaintiffs filed suit challenging the 2009 BiOp.

Decision

Following a review of Amendment 31 and supporting analyses for compliance with the Magnuson-Stevens Act and other applicable law, including but not limited to, NEPA, the Coastal Zone Management Act, and Information Quality Act, NMFS approves the actions contained in the amendment. The rationale for this decision is supported by the FEIS, and summarized below. The proposed actions are viewed as those that achieve the purpose and need for action in a way that best addresses Magnuson-Stevens Act mandates and the multiple objectives outlined in the FMP. Additional alternatives considered by the Council and NMFS in developing the rule and Amendment 31, but eliminated from detailed study, are described in Appendix C of the FEIS.

Rationale For Decision

The Council chose preferred options to establish gear modifications, season-area closures, and a restrictive endorsement program to allow continued participation in the bottom longline component of the commercial reef fish fishery while still providing adequate protection for sea turtles. Based on a NMFS 2009 analysis provided to the Council, the combined effects of these actions will achieve between 48-67 percent reductions in effective bottom longline fishing effort for reef fish. Positive impacts to the biological environment include reductions in bycatch of both hardshell sea turtles and non-targeted or undersized reef fish as well as reduced physical impacts from longline gear.

The Council selected preferred alternatives based on fishing effort reduction and the potential reduction of interactions with sea turtles. The potential reductions in effective fishing effort for the Council's preferred alternatives are approximately 14-16 percent for **Action 2**, 18-37 percent for **Action 3**, and 27-39 percent for **Action 4**. These reductions are not additive, and are dependent on various scenarios of effort shifting because of the regulatory restrictions that will be imposed from this action. However, the overall reduction in effective effort based on the combination of the preferred actions is 48-67 percent. This met the Council's goal of meeting recommended reductions in effort, which is anticipated to result in similar reductions in sea turtle interactions.

Action 1: Allow or Disallow Squid Bait in the Bottom Longline Component of the Reef Fish Fishery

> **<u>Preferred Alternative 1</u>** – No action. Do not restrict bait in the bottom longline component of the reef fish fishery.

NMFS has **approved** this action to allow squid bait.

Preferred Alternative 1 (no action) would maintain the same level of biological and ecological impacts currently in the fishery. **Preferred Alternative 1** would not affect the physical, biological, social, or administrative environments relative to current conditions. **Preferred Alternative 1** would not be expected to result in any change in bait usage or other behavioral changes in fishing methods over the short-term in the bottom longline component of the reef fish fishery. As a result, no short term adverse economic effects would be expected. Cut squid has been used as preferred bait in the bottom longline component because cut bait reduces costs and tends to remain on hooks for long soak times. The Council chose **Preferred Alternative 1** due to the unknown effect of bait type relating to interactions with sea turtles and the difficulties associated with monitoring bait type at sea and at the dock.

Rejected alternatives to the proposed action to allow or disallow squid bait.

Environmentally Preferable Alternative 2 – Prohibit the possession of squid or squid parts on a vessel that has reef fish and longline gear aboard, unless the longline gear is "stowed appropriately".

Environmentally Preferable Alternative 2 would prohibit the possession of squid or squid parts on vessels that have reef fish and longline gear aboard. Approximately 38 percent of all sea turtle takes occurred when squid was used as bait; however, the take rate of sea turtles on squid bait may be an artifact of squid being the predominant bait used in the fishery, plus it remains on the hook longer than some fish baits; thus, there is simply a greater probability of a sea turtle encountering squid bait than other types of bait. Information specific to the quantitative reductions of sea turtle interactions from a change of bait type is not available. In addition, as noted in the amendment, sea turtles were taken on both squid and fish (including skate and shark bait, which would be a non-natural food for sea turtles), and bait type was not recorded for nearly half the observed takes. This prohibition has the potential to result in fewer interactions between loggerhead sea turtles and longline gear, although such potential benefit is largely speculative, and it could result in adverse economic impacts stemming from increased bait costs, higher labor demands, or possible reductions in catch per unit effort (CPUE). The magnitude of anticipated reductions in interactions between loggerhead sea turtles and longline gear, the economic value associated with these reductions, and the potential adverse economic impacts to the bottom longline component of the reef fish fishery cannot be quantified at this time. Administrative impacts of this alternative would have been primarily be on law enforcement, due to the difficulty in monitoring bait type at sea and at the dock. The effects of **Alternative 2** on percentage of sea turtle interactions is unknown, even though field and laboratory studies show there is potential for reducing sea turtle being hooked with gear. Further research is needed to predict the extent of this reduction for the bottom longline component of the reef fish fishery. During the scoping process, the Council considered additional bait modifications such as bait size, and whole versus cut baits. Due to the lack of information associated with the potential effects of these bait modifications to reduce sea turtle takes, the Council moved these alternatives to considered, but rejected.

Action 2: Restrict the Use of Bottom Longline Gear for Reef Fish in the Eastern Gulf of Mexico (east of 85°30' W longitude, near Cape San Blas, Florida)

> **Preferred Alternative 2** – Establish north-south boundaries for prohibition on the use of bottom longline gear. **Environmentally Preferable Option c:** the entire latitudinal extent of the eastern Gulf
>
> **Preferred Alternative 3** – Establish depth boundaries for prohibition on the use of bottom longline gear. Longline gear would be prohibited shoreward of a line approximating a specific depth contour. **Option b:** 35 fathoms
>
> **Preferred Alternative 4** – Establish seasons for prohibition on the use of bottom longline gear. **Option a:** June-August

NMFS has **approved** this time/area closure to reduce sea turtle interactions.

The Council selected a combination of preferred alternatives to achieve greater reductions for sea turtle interactions. NMFS and the Council chose their preferred options for a time-area closure after consideration of the satellite-tag, fishery observer, and aerial survey information on sea turtle distribution and density on the West Florida continental shelf. The Council chose **Preferred Alternative 2, Option c** to set the latitudinal boundaries for the time-area closure. The Council chose **Preferred Alternative 3, Option b** to set a boundary for the time-area closure based on a bathymetric depth contour (i.e., a longitudinal boundary). Actual implementation will be through a series of point-to-point lines following the approximate isobath. The best scientific information available to NMFS and the Council to quantitatively assess the seasonal distribution and density of loggerhead sea turtles over the West Florida continental shelf comes from aerial surveys conducted by the SEFSC. Those data reveal a significant decrease in density of loggerhead sea turtles with increasing depth during the summer months. In a satellite telemetry study, A.D. Tucker found that 89 percent of foraging destinations of female loggerhead sea turtles were in depths of 50 fathoms or less (Mote Marine Laboratory unpublished data); however, most longline fishing for shallow-water grouper is at these depths as well. To help maintain a viable fishery, the Council chose **Preferred Option b** as an intermediate to other options. A closure based on the 35-fathom contour (**Alternative 3 Preferred Option b**) may reduce bottom longline fishing effort for reef fish; however, it could cause an increase in effort between 35 and 50 fathoms. In turn, the geographically displaced effort could result in an equal amount of sea turtle interactions in water depths greater than 35 fathoms (**Alternative 3 Preferred Option b**); however, sea turtle densities are lower in these deeper waters. Additionally, if a shift in fishing effort occurs from bottom longline to vertical line gear, it is likely that sea turtle interactions with vertical line would increase because of increasing numbers of vessels using this gear type.

The Council chose **Preferred Alternative 4, Option a** to prohibit the use of longline gear during specific months. In multiple studies, observed sea turtle takes by longline gear, sighting rates of hardshell sea turtles, and strandings of hardshell sea turtles in the eastern Gulf increased during spring and summer. In the observer records, 76 percent of sea turtle takes occurred from June through August **Preferred Alternative 4, Option a**.

The Council's preferred combination of alternatives, **Alternative 2 Option c, Alternative 3 Option b,** and **Alternative 4 Option a** encompass the time and area where 62 percent of hardshell sea turtle takes by longline gear were documented by the NMFS April 2009 report summarizing data from the observer study. The **environmentally preferable Alternative 2, Option c,** area closure for the entire latitudinal extent of the eastern Gulf, would encompass the area where 100 percent of observed sea turtles were taken. The impact on sea turtles would include reduced takes by the bottom longline component of the reef fish fishery from the decrease in fishing effort and elimination of gear. This alternative would not meet the Council's objective to maintain a viable bottom longline component of the fishery. Additionally, a shift in effort from bottom longline to vertical line gear may cause an increase in sea turtle interactions in the vertical line component.

Rejected alternatives to the proposed action to establish time/area closures

Alternative 1 – No Action. Allow the use of bottom longline gear throughout the eastern Gulf year round in waters seaward of a line approximating the 20 fathom contour.

Preferred Alternative 2 – Establish north-south boundaries for prohibition on the use of bottom longline gear. Options in this alternative may be combined with options from other alternatives to refine these restrictions.

> **Option a**: between 27° and 28° N latitude (approximately Charlotte Harbor to Tarpon Springs, Florida)
>
> **Option b**: between 26° and 28° N latitude (approximately Naples to Tarpon Springs, Florida)

Preferred Alternative 3 – Establish depth boundaries for prohibition on the use of bottom longline gear. Longline gear would be prohibited shoreward of a line approximating a specific depth contour. Options in this alternative may be combined with options from other alternatives to refine these restrictions.

> **Option a:** 30 fathoms
>
> **Option c**: 40 fathoms
>
> **Environmentally Preferable Option d**: 50 fathoms

Preferred Alternative 4 – Establish seasons for prohibition on the use of bottom longline gear. Options in this alternative may be combined with options from other alternatives to refine these restrictions.

> **Option b**: April-August
>
> **Environmentally Preferable Option c**: Year-round

Discussion: **Alternative 1,** no action, would allow bottom longline fishing for reef fish to proceed in waters greater than 20 fathoms in the eastern Gulf year round unless existing quotas have been met. If the Council had chosen **Alternative 1**, other actions would need to be taken to reduce takes sufficiently to protect and conserve sea turtles. **Alternative 2** may reduce sea turtle takes by setting north-south boundaries for areas closed to reef fish bottom longline fishing. Observer data show most of the sea turtle takes occurred on fishing trips west of the Tampa Bay area. An area closure with north-south boundaries of 27° and 28° N latitude (**Option a**) would encompass the area where 57 percent of the sea turtle takes were documented by the observer program, and an area with north-south boundaries ranging of 26° and 28° N latitude (**Option b**) would encompass the area where 71 percent of sea turtles were taken. Of longline trips from logbooks reporting shallow-water grouper (SWG) landings, 49 percent were between 27° and 28° N latitude and 80 percent were between 26° and 28° N latitude. The closure of a larger area could remove a greater amount of the fishing effort, and thus be more likely to reduce sea turtle takes. Closure of a smaller area may simply move effort to the open area without decreasing sea turtle takes, because sea turtle foraging grounds cover most of the eastern Gulf.

Alternative 3 would close an area based on depth contours. Studies suggest that loggerhead sea turtles spend most of their time in the top three fathoms of water, but may dive to 100 fathoms. **Option a** (30 fathoms) would cover the area where 71 percent of observed sea turtles were captured. The average fishing depth for observed SWG sets that captured sea turtles was 28.5

fathoms, as opposed to an average fishing depth of 36.6 fathoms for all observed sets; thus either of these options would prohibit the use of bottom longline gear to fish for reef fish in the areas where much of the fishing effort and sea turtle takes were observed. Of observed sea turtle takes, 90 percent were on sets at 40 fathoms or less (**Option c**), and all but one sea turtle take documented by observers were on sets at 50 fathoms or less (**Environmentally Preferable Option d**). The most restrictive closure at 50 fathom **(Environmentally Preferable Option d)** could displace an estimated 74 percent of the bottom longline fishing effort that occurred in water depths from 20 to 50 fathoms as estimated from the logbook dataset. The probability of interaction may either increase or decrease in waters greater than the fathom regulation line depending on whether a geographic or gear effort shift occurs in the fishery. If fishing effort shifts geographically to deeper water, sea turtle interactions could be reduced although probably not eliminated. Additionally, if a shift in fishing effort occurs from bottom longline to vertical line gear, it is likely that sea turtle interactions with vertical line would increase. For an in-depth discussion of geographic shift of fishing effort and potential gear conversion, see Section 6.2.3.

Under **Alternative 4**, seasonal closures could occur when sea turtles are most likely to be captured. The entire eastern Gulf could be closed during a seasonal closure or just a portion of the fishing area, such as described above for area and depth closures. In the observer records, 95 percent occurred from April through August (**Option b**). Although seasonal closures may reduce effort during certain months, an increase in effort during the open fishing months could result in limited or no reduction in sea turtle takes. **Environmentally Preferable Alternative 4, Option c** would restrict fishing year-round fishing. Although this restriction may reduce sea turtle interactions, the bottom longline fleet targeting reef fish may not remain viable. Impacts of these alternatives on the physical and biological environments would depend on the level fishing effort is reduced.

Action 3: Longline Endorsements to fish east of Cape San Blas

> **<u>Preferred Alternative 4</u>** – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps[1] or longline gear of 40,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings. **<u>Option b</u>:** during the 1999-2007 period.
>
> The transfer of a longline endorsement will be: **<u>sub-option (ii)</u>:** unrestricted between commercial reef fish permit holders

NMFS has **approved** this action to establish a longline endorsement.

The Council chose **Preferred Alternative 4, Option b, sub-option ii,** to establish a qualifying endorsement for the use of bottom longline gear in the Gulf reef fish fishery. The decision was based on the goal of implementing adequate protective measures for loggerhead sea turtles as while maintaining a viable bottom longline fleet pending the implementation of Amendment 31 or alternative long-term mitigation measures. The Council chose the **Preferred Alternative 4**

[1] To determine a permit's eligibility for a longline endorsement, reef fish landings using fish traps are considered only if the permit also recorded reef fish landings using longline gear after February 7, 2007.

that will grant a longline endorsement to the reef fish permit to any fisherman with a valid or renewable reef fish permit with minimum annual average reef fish landings using fish traps or longline gear of 40,000 pounds per permit. The Council decided that endorsement requirements greater than 40,000 pounds per permit would not allow enough vessels to participate in the bottom longline component of the reef fish fishery to maintain a viable fleet. In contrast, the Council decided that endorsement requirements less than 40,000 pounds per permit would not reduce effort enough to maintain adequate protective measures for sea turtles by reducing bycatch.

Under **Preferred Option b,** annual average landings will be based on logbook landings during the 1999-2007 time period. The Council chose to use the years 1999 through 2007 to encompass the most recent data available at the time the amendment was developed, thus providing a more robust data set from which to evaluate historical participation in the fishery. Beginning the time series in 1999 was a recommendation by the Council's Reef Fish Advisory Panel.

Preferred Alternative 4, Option b would limit the number of participants using longline gear in the fishery in the eastern Gulf to 61 permits and reduce longline trips by 54 percent, approximately. Effort reductions expected from the implementation of **Preferred Alternative 4, Option b** is expected to result in greater reduction of the interactions between hardshell sea turtles and bottom longline gear while preserving 60.5 percent of the reef fish landings using fish traps or longline gear. Previous regulations required the phase out of fish traps by February 2007. Because some of these trap fishermen converted to longline gear, the Council decided to allow the addition of the fish trap landings to their longline landings for the qualifying endorsement requirements. Incentives for remaining longline operators to increase effort may be less of a consideration under **Preferred Alternative 4, Option b** due the limited number of operators that would remain under the required minimum landings threshold set in this alternative. The NMFS cumulative effects analysis determined the **Preferred Alternatives** in **Action 3** alone is expected to reduce effective effort in the bottom longline fishery for reef fish between 18-37 percent, which is expected to translate to a similar reduction in hardshell sea turtle interactions with gear. The Council chose **sub-option ii** to allow fishermen the flexibility to transfer of the longline endorsement to other reef fish permit holders.

Preferred minimum average landings selected for endorsement eligibility (40,000 pounds per year per permit) will allow those longline fishermen who consistently depend on the fishery to qualify for an endorsement and is expected to mainly exclude operators with limited or sporadic participation in the longline component of the reef fish fishery. In contrast to a community-based qualification requirement such as **Alternative 7**, the Council intends to ensure a fair and equitable distribution of longline endorsements to fish in the eastern Gulf by basing eligibility criteria on logbook records; all commercial reef fish permit holders are required to submit logbooks, regardless of their community association. Although the endorsement program will prevent non-qualifying vessels from using longline gear in the eastern Gulf, these vessels will continue to have the opportunity to participate in the reef fish fishery by converting to another gear type, e.g., vertical line gear, acquiring an endorsement through transfer, or by fishing in other areas of the Gulf. The Council also considered the social framework and economics of the fishery by selecting a minimum landings threshold for endorsement eligibility that is expected to maintain a viable longline component and continue to support shore-side businesses, associated infrastructure, and fishing communities dependent on the bottom longline component in the

eastern Gulf.
<u>Rejected alternatives to establish a longline endorsement.</u>

Alternative 1 – (No Action) Do not establish a longline endorsement to the commercial reef fish permit

Alternative 2 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps[1] or longline gear of 20,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings.

Option a: during the 1999-2004 period
Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Sub-option (ii): unrestricted between commercial reef fish permit holders;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Alternative 3 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps[1] or longline gear of 30,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings.

Option a: during the 1999-2004 period
Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Sub-option (ii): unrestricted between commercial reef fish permit holders;
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

<u>**Preferred Alternative 4**</u> – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps[1] or longline gear of 40,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings.

Option a: during the 1999-2004 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited
Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Alternative 5 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps[1] or longline gear of 50,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings.

Option a: during the 1999-2004 period

Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited

Sub-option (ii): unrestricted between commercial reef fish permit holders;

Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Environmentally Preferable Alternative 6 – Establish a longline endorsement to the reef fish permit; a minimum annual average reef fish landings using fish traps[1] or longline gear of 60,000 pounds (gutted weight) per permit will be required to qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings.

Option a: during the 1999-2004 period

Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited

Sub-option (ii): unrestricted between commercial reef fish permit holders;

Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length

Alternative 7 - Establish a longline endorsement to the reef fish permit to allow sustained participation of fishing communities where the ex-vessel value of red grouper landings accounts for at least 15 percent of the total ex-vessel value of all species landed in the community. Reef fish permits reporting landings at these communities for at least 5 years during the period of 1999-2007, with a minimum annual average reef fish landings using fish traps[1] or longline gear of 30,000 pounds (gutted weight) per permit, will qualify for a longline endorsement. Annual average landings will be calculated based on logbook landings.

Option a: during the 1999-2004 period

Option b: during the 1999-2007 period

The transfer of a longline endorsement will be

Sub-option (i): prohibited

Sub-option (ii): unrestricted between commercial reef fish permit holders at the same community of landings;

Sub-option (iii): limited to commercial reef fish permit holders with a vessel of equal or lesser length at the same community of landings

Note: To be eligible for a longline endorsement, the permit to which qualifying reef fish landings are attached must be valid or renewable (within the one year grace period immediately following expiration) when the endorsements are issued. For endorsement eligibility, only legal landings reported in compliance with applicable state and federal regulations will be accepted. For endorsement eligibility purposes, permit stacking provisions included in Reef fish Amendment 29 would not apply.

The 1999-2004 time period was also considered, as it mimicked the time frame used to establish substantial participation and share allocation for the grouper-tilefish IFQ program established in Reef fish Amendment 29. However, using the 2004 date as a cut-off, which reflects the control date for the fishery, did not provide the Council with the most recent information regarding participation in the fishery.

Discussion: **Alternative 1** would not establish a longline endorsement to the reef fish permit or affect the number of reef fish permit holders that would use longline gear in the fishery. As such, under the no action alternative (**Alternative 1**), interactions between hardshell sea turtles and longline gear would remain at unacceptably high levels.

Remaining alternatives considered under this action specify eligibility criteria for longline endorsements to fish in the eastern Gulf. Criteria for longline endorsement eligibility are expressed as minimum average annual reef fish landings using fish traps or longline gear based on different time periods. Additionally, conditions under which longline endorsements could be transferred are included in remaining alternatives. It follows that greater minimum average landings thresholds for endorsement eligibility would leave fewer participants using longline gear in the fishery, potentially resulting in reduced fishing effort and greater reduction of interactions between hardshell sea turtles and bottom longline gear.

Alternative 2 would establish a longline endorsement to the reef fish permit. A minimum annual average reef fish landings using fish traps or longline gear of 20,000 pounds per permit during the time period considered would be required to qualify for a longline endorsement. **Alternative 2** would result in 117 and 118 longline endorsements for 1999-2007 and 1999-2004, respectively. For the 1999-2007 time period, qualifying permits would represent 39.4 percent of permits landing reef fish using fish traps or longline gear and account for 85.9 percent of the reef fish landings. This continued level of participation, in combination with the other selected actions, would not reduce effort, and potential sea turtle interactions, to the desired level.

Alternative 3 would grant a longline endorsement to the reef fish permit to any fisherman with a valid or renewable reef fish permit with a minimum annual average reef fish landings using fish traps or longline gear of 30,000 pounds per permit during the period considered. **Alternative 3** would further limit the number of participants using longline gear in the reef fish fishery in the eastern Gulf; potentially resulting in greater reduction of interactions between hardshell sea turtles and bottom longline gear. Under **Option b**, i.e., the 1999-2007 time period, **Alternative 3** would reduce the number of participants using longline gear in the reef fish fishery in the eastern Gulf to 82. Qualifying permits would account for 72.1 percent of longline reef fish landings and 71.3 percent of the effort (measured in longline sets) in the eastern Gulf. This continued level of participation, in combination with the other selected actions, would not reduce effort, and potential sea turtle interactions, to the desired level.

Alternatives 5 and **6** would require higher annual average reef fish landings using fish traps or longline gear to qualify for an endorsement. **Alternatives 5** and **6** would require 50,000 pounds and 60,000 pounds, respectively. **Alternative 5** would drop the number of qualifying permits to 39 and 45 for 1999-2007 and 1999-2004, respectively, representing 44.9 percent and 48.8 percent of the reef fish landings, respectively. By granting longline endorsements to only about

13 percent of the permits with reef fish landings using fish traps or longline gear, **Alternative 5** would be expected to result in substantial reductions in interaction between hardshell sea turtles and longline gear. However, associated decreases in participation and projected effort reductions raise concerns relative to the viability of the longline component and associated shore-side businesses.

Environmentally Preferable Alternative 6 would result in 22 and 31 qualifying permits for 1999-2007 and 1999-2004, respectively. Under **Option b**, i.e., the 1999-2007 time period, qualifying permits would account for 30.1 percent of reef fish landings and 24.3 percent of the effort (measured in longline sets) in the eastern Gulf. Based on the reduction in effective fishing effort and the associated potential reduction in sea turtle interactions, **Alternative 6** would be **environmentally preferable**; however, the drastic reduction in effective fishing effort would not achieve the Council's objective to maintain a viable bottom longline component of the reef fish fishery.

In addition to a minimum annual average reef fish landings requirement, **Alternative 7** considers a community-based eligibility requirement to allow sustained participation of fishing communities that rely on the longline component of the reef fish fishery. A fishing community reliant on the longline component is defined as a community where the ex-vessel values of red grouper landings average at least 15 percent of the total ex-vessel value of all species landed in the community during the 1999-2007 period. Reef fish permits reporting landings at these communities for at least 5 years during the period of 1999-2007, with a minimum annual average reef fish landings using fish traps or longline gear of 30,000 pounds per permit, would qualify for a longline endorsement. **Alternative 7** would result in 44 and 36 qualifying permits for 1999-2007 and 1999-2004, respectively. By comparison, **Alternative 3**, which would also require 30,000 pounds minimum annual average reef fish landings would grant an endorsement to 82 permits for the 1999-2007 period. The Council did not select **Alternative 7** as a preferred because the distinction of a reliant community may raise fairness and equity issues by excluding permit owners who meet the landings requirement, but do not live in one of the targeted fishing communities.

It is expected that a reduction in the number of participants using longline gear in the fishery would result in reductions in the number of interactions between hardshell sea turtles and bottom longline gear. The reductions in interactions may potentially be limited by possible effort increases by longline operators who qualified for an endorsement. It is also expected that some of the longline operators who would not qualify for an endorsement would convert to vertical line gear to continue to participate in the reef fish fishery.

Action 4: Modify Fishing Practices and Gear for Vessels using Bottom Longline Gear to Harvest Reef Fish east of Cape San Blas

> **<u>Preferred Alternative 3</u>** – Limit the number of hooks for vessels that have a longline endorsement to their reef fish permit. **<u>Option b</u>:** 1,000 hooks of which no more than 750 hooks are rigged for fishing[2] or fished.

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[2] rigged for fishing is defined as: hooks attached to a line or other device capable of attaching to the mainline of the longline

NMFS has **approved** the action to modify fishing practices and gear
The Council chose **Preferred Alternative 3** to limit the number of hooks allowed onboard and hooks being fished for vessels that possess a longline endorsement to the reef fish. Logbooks and observer programs do not record the number of hooks per vessel, but instead record the number of hooks per set. From the enforcement perspective the number of hooks per vessel is considered an easier gear restriction for law enforcement officials to check than a previously considered alternative of hooks per mile. **Preferred Alternative 3, Option b** alone could result in a baseline reduction in effort between 27-39 percent, depending on assumptions about effort shifts and effort compensation. The Council decided that restricting the number of hooks per vessel will reduce the overall fishing effort and, in turn, reduce the interactions with sea turtles.

Rejected alternatives to the proposed action to modify fishing practices and gear.

Alternative 1 - No Action - Allow current fishing practices and gear throughout the eastern Gulf.
Alternative 2 - Limit mainline length

- **Environmentally Preferable Option a:** 1 nautical mile
- **Option b:** 2 nautical miles
- **Option c:** 4 nautical miles
- **Option d:** 5 nautical miles

Preferred Alternative 3 – Limit the number of hooks for vessels that have a longline endorsement to their reef fish permit.

- **Environmentally Preferable Option a:** 500 hooks
- **Option c:** 1,500 hooks

Alternative 4 - Limit gangion length

- **Option a:** 2 feet (ft)
- **Option b:** 4 feet
- **Option c:** 6 feet

Discussion: This action considers a series of restrictions on fishing practices and gear in the reef fish fishery to reduce interactions between hardshell sea turtles and bottom longline reef fish gear with the exception of the no action **Alternative 1**. Reductions in fishing effort by gear restrictions, such as mainline length number of hooks per vessel, and gangion length could reduce gear interactions with sea turtles. The **Environmentally preferable alternative** would be a combination of alternatives to limit the mainline length to 1 nautical mile and number of hooks to 500 per vessel (**Alternative 2, Option a, and Alternative 3, Option a**). The combined actions may have the greatest reduction in effective fishing effort and, in turn, reduce potential sea turtle interactions. However, limiting the mainline length and hooks would also decrease the amount of time required for each set and may allow fishermen to complete more sets per day. Therefore, the decrease in effective fishing effort may not be as drastic as expected. Implementing the **environmentally preferable** gear modifications would not achieve the Council's goal to maintain a viable bottom longline component of the reef fish fishery. **Alternative 2** limits mainline length (nautical miles) in the bottom longline component of the reef fish fishery. Based on 2006-2008 observer data this alternative could reduce hardshell sea turtle interactions with bottom longline gear. The reef fish bottom longline industry uses a range of mainline lengths, which typically depend on fishing vessel size. Using observer data sets, the mean mainline length with hardshell sea turtle takes was significantly longer than the mean mainline length without hardshell sea turtle takes. The average mainline length for sets with and without sea turtle takes were estimated at 6.7 and 5.3 nautical miles, respectively. **Environmentally Preferable Option a** limits mainline length to 1 nautical mile, **Option b** limits mainline length to 2 nautical miles. **Option a** or **b** would be a considerable change to the fishing practices currently used in the bottom longline component of the reef fish fishery. **Option c** limits mainline length to 4 nautical miles and is the longest mainline length, documented by observers without a recorded hardshell sea turtle take. Bottom longline fishers in the industry suggest limiting mainline length to 5 nautical miles (**Option d**). Five nautical miles of mainline was frequently documented by observers in the Reef Fish Observer Program, but is also less than the average length recorded in logbooks or by observers. However, little data exist to support that limiting the mainline length to 5 nautical miles as a gear restriction could adequate reduce hardshell sea turtle interactions with longline gear.

Environmentally Preferable Alternative 3, Option a to limit the number of hooks allowed onboard and hooks being fished for vessels to 500 hooks per vessel would reduce the fishing effort; however, it would also reduce the efficiency of the fleet. Logbooks and observer programs do not record the number of hooks per vessel, but instead record the number of hooks per set. From the enforcement perspective the number of hooks per vessel is considered an easier gear restriction for law enforcement officials to check than a previously considered alternative of hooks per mile.

Alternative 4 limits gangion length (i.e., leader length) in the bottom longline component of the reef fish fishery. Anecdotal reports from bottom longline reef fish fishermen suggest that hardshell sea turtles were not as frequently hooked with gear until longer (i.e., 6 to 10 ft) gangions were used. Observers recorded some hardshell sea turtle takes on all gangion lengths. **Option a** limits gangion length to 2 ft, which is below the average length recorded in the reef fish fishery from the observer program. **Option b** limits gangion length to 4 ft and is used by approximately 13 percent of the fishery. **Option c** limits gangion length to 6 ft which is presently used by 28 percent of the fishery. As to the potential reduction of sea turtle interactions related to shorter gangions, there is little difference in the gangion length and ability to take turtles. Gangions 4 ft in length (**Option b**) are only used by only 13 percent of the fleet, but their use is associated with 33 percent of all observed sea turtle takes, thus representing a larger proportion of the total takes by gangions of that length. Further research is needed to determine if limiting the gangion length would reduce interactions with sea turtles. Additional concerns regarding gear modification were provided by the EPA as comments of the final EIS. The comment addressed the feasibility of increasing the size of circle hooks to reduce sea turtle takes. Contrary to the pelagic longline fishery in the South Atlantic, which takes mainly juvenile sea turtles, the majority of sea turtles taken by bottom longlines in the Gulf are adult loggerhead sea turtles. Increasing the size of the circle hook large enough to physically preclude a large sea turtle from being taken would also preclude all but the largest grouper from being caught. Information is not available to determine if hook size or hook guards are practical alternatives.

Mitigation, Monitoring and Enforcement

CEQ regulations implementing NEPA direct agencies to identify in the ROD whether all practical means to avoid or minimize environmental harm from the proposed actions have been adopted, and if not, why they were not (40 CFR Part 1505.2(a)(b)(c)). Mitigation measures are the practical means to avoid, minimize, and reduce impacts, and compensate for unavoidable impacts. Additionally, the regulations require a monitoring and enforcement program be adopted and summarized where applicable for any mitigation.

In relation to the purpose and need for action, NMFS has thoroughly analyzed in the FEIS, and described in this ROD, a range of reasonable alternatives and their associated environmental impacts. The proposed actions are expected to result in adverse economic impacts for the commercial sector of the reef fish fishery, especially the longline component. Overall, it is likely that there will be exit from the fishery and increased unemployment in those communities most affected by the rule. The recreational sector of the Gulf reef fish fishery would not be expected to be directly affected by this proposed action. However, the recreational sector could be indirectly affected if the proposed action affects the overall availability, and subsequent catch rates, of reef fish to the recreational sector. Overall, these actions will reduce the fishing effort in the bottom longline component of the reef fish fishery and, in turn, the interactions of bottom longline gear with sea turtles. As a consequence to these considerations, NMFS concludes that all practical means to avoid, minimize, or compensate for environmental harm from the approved actions have been adopted, and the public has had adequate opportunity for involvement, input, and comment during the deliberative process of the Amendment 31 and FEIS. Both the short-term and long-term biological and socioeconomic effects of the actions will be monitored through observer programs, logbook programs, landing reporting programs, recreational surveys, and fishery-independent surveys. Should sea turtle takes continue to exceed the ITS from the 2009 BiOp, the Council or NMFS will take appropriate actions.

Regulations implementing FMPs are enforced through actions of the NOAA's Office of Law Enforcement, the United States Coast Guard, and various cooperative state authorities. To better coordinate enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the Magnuson-Stevens Act. These activities are coordinated by the Council's Law Enforcement Advisory Panel and the Gulf States Marine Fisheries Commission's Law Enforcement Committee.

Scoping Process and Public Involvement

Through the FEIS, as documented in this ROD, the Council and NMFS have analyzed the various alternatives, associated environmental impacts, and the extent to which the impacts could be mitigated, in relation to the objectives of the proposed action. As summarized below, NMFS and the Council have considered public and Agency comments received during the various EIS review periods. Consequently, NMFS concludes that all practical means to avoid, minimize, or compensate for environmental harm from the proposed action have been adopted, and the public has had adequate opportunity for involvement, input, and comment during the deliberative phases of FMP/FEIS development on which Amendment 31 and final rule are based.

The Council and NMFS published an NOI for scoping for a draft EIS for Amendment 31 on November 25, 2008. A scoping document was presented at a series of scoping hearings conducted from December 9-10, 2008, in Panama City, Florida and Madeira Beach, Florida. Details of the meetings are presented in Section 10 of the final EIS.

Development of a public hearing draft of the amendment/DEIS began subsequent to Council action on the Options Paper at its January 2009 meeting. A public hearing draft was reviewed and approved by the Council at its April 2009 meeting, and public hearings (number of hearings) were conducted in Florida (3), Mississippi (1), Louisiana (1), and Texas (1) from May 26, 2009, through June 8, 2009. (See Section 11 in the final EIS for meeting details). The Council also accepted written comments on the public hearing draft through June 12, 2009. The NOA for the draft EIS was published in the *Federal Register* on November 13, 2009, with a 45-day comment period and the NOA for the final EIS was published in the *Federal Register* on December 31, 2009 (see Background for details). Comments were received from the Environmental Protection Agency and six additional individuals, agencies or groups. All comments received are posted to Federal e-Rulemaking Portal (http://www.regulations.gov, docket number: **NOAA-NMFS-2008-0310**). These comments were evaluated and used to improve the final EIS. A summary of the comments and responses to those comments can be found in Appendix E of Amendment 31/final EIS.

Findings Required by Other Laws and Regulations

This ROD reflects NMFS' decision to approve the actions as identified and analyzed in the consolidated Amendment 31/FEIS. NMFS has determined the proposed actions are in compliance with applicable law. These determinations are documented in other NMFS documents, including but not limited to, an initial regulatory flexibility analysis under the Regulatory Flexibility Act and determinations regarding the Coastal Zone Management Act, Essential Fish Habitat regulations, Endangered Species Act, and the Information Quality Act.

The intended effect of the rulemaking is to implement adequate protective measures for loggerhead sea turtles while maintaining a viable bottom longline fleet pending the implementation of Amendment 31 or alternative long-term mitigation measures. The proposed actions are expected to directly or indirectly benefit the overall health of the biological, physical, and human environment. Positive impacts to the biological environment include reductions in bycatch of both hardshell sea turtles and non-targeted or undersized reef fish. The proposed actions are expected to result in adverse economic impacts for the commercial sector of the reef fish fishery, especially the longline component. The recreational sector of the Gulf reef fishery would not be expected to be directly affected by this proposed action. However, the recreational sector could be indirectly affected if the proposed action affects the overall availability, and subsequent catch rates, of reef fish to the recreational sector. Overall, these actions will reduce the fishing effort in the bottom longline component of the reef fish fishery and, in turn, the interactions of bottom longline gear with sea turtles.

Implementation

Actions proposed, analyzed, and approved by the Secretary will be implemented by promulgation of a final temporary rule in the *Federal Register*.

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3/29/10
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