ENVIRONMENTAL ASSESSMENT AND REGULATORY IMPACT REVIEW FOR A RULE TO REDUCE SEA TURTLE BYCATCH BY THE EASTERN GULF OF MEXICO BOTTOM LONGLINE COMPONENT OF THE REEF FISH FISHERY

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NATIONAL MARINE FISHERIES SERVICE, SOUTHEAST REGIONAL OFFICE
263 13th AVENUE SOUTH
ST. PETERSBURG, FL 33701-5505

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Abbreviations Used in This Document

ACL	Annual Catch Limit
AM	Accountability Measures
APA	Administrative Procedures Act
BiOp	Biological Opinion
CEA	Cumulative Effects Analysis
CEQ	Council on Environmental Quality
CFLP	Coastal Fisheries Logbook Program
Council	Gulf of Mexico Fishery Management Council
CZMA	Coastal Zone Management Act
DQA	Data Quality Act
DWG	Deepwater Grouper
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fishery Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
ELMR	Estuarine Living Marine Resources
ESA	Endangered Species Act
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impacts
FWC	Florida Fish and Wildlife Conservation Commission
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
HAPC	Habitat Area of Particular Concern
HMS	Highly Migratory Species
IFQ	Individual Fishing Quota
INBS	Index Nesting Beach Survey
ITS	Incidental Take Statement
LOF	List of Fisheries
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act

MMPA	Marine Mammal Protection Act
mp	million pounds
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOR	Net Operating Revenues
NOS	National Ocean Service
OMB	Office of Management and Budget
ORF	Other Reef Fish
OSWG	Other Shallow Water Grouper
RFEM	Reef Fish Electronic Monitoring
RFFA	Reasonably Foreseeable Future Actions
RFOP	Reef Fish Observer Program
RIR	Regulatory Impact Review
RPA	Reasonable and Prudent Alternatives
RPM	Reasonable and Prudent Measures
SBLOP	Shark Bottom Longline Observer Program
Secretary	Secretary of Commerce
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office (NMFS)
SWG	Shallow Water Grouper
VEC	Valued Environmental Components

Environmental Assessment (EA) Cover Sheet

National Marine Fisheries Service
Southeast Regional Office
263 13TH Avenue South
St. Petersburg, FL 33701-5505
Contact person(s): Peter Hood

727-824-5305
727-824-5308 (FAX)
http://sero.nmfs.noaa.gov

Name of Action
Environmental Assessment and Regulatory Impact Review for a Rule to Reduce Sea Turtle Bycatch by the Eastern Gulf of Mexico Reef Fish Bottom Longline Component of the Reef Fish Fishery

Type of Action
(X) Administrative ( ) Legislative
(X) Draft ( ) Final

Summary
Results from a recent Southeast Fisheries Science Center observer analysis indicate the number of loggerhead sea turtle takes authorized in the 2005 biological opinion (BiOp) for the bottom longline component of the reef fish fishery in the Gulf of Mexico (Gulf) has been exceeded. The west Florida shelf is an important sea turtle foraging habitat. Individual sea turtles incidentally caught by the bottom longline component of the fishery are sexually immature juveniles and mature adult loggerhead sea turtles that have high reproductive potential. Additionally, it has been argued that the observed decline in the annual counts of loggerhead sea turtle nests in peninsular Florida can best be explained by a decline in the number of adult female loggerhead sea turtles in the population. Action is needed to reduce the fishery's impact on this threatened species, consistent with Endangered Species Act and Magnuson-Stevens Fishery and Conservation Act (Magnuson-Stevens Act) mandates.

The Gulf of Mexico Fishery Management Council (Council) has proposed long-term measures to address sea turtle bycatch in Amendment 31 to the Fishery Management Plan for the Reef Fish Resources of the Gulf; however, short-term action is needed to reduce this bycatch while NMFS reviews the Council's proposed long-term measures. Although approved by the Council, Amendment 31 has not yet been approved or implemented by NMFS. To immediately reduce the bycatch while the Council completed Amendment 31, the Council requested NMFS to implement an emergency rule under the Magnuson-Stevens Act (Magnuson-Stevens Act) (Effective May 18, 2009- October 28, 2009) which prohibits through October 28, 2009, the use of bottom longline gear for harvesting reef fish in water depths less than 50 fathoms. Additional interim action is now needed to address sea turtle bycatch until long-term measures are approved and implemented. 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. The intended effect of the proposed rulemaking is to maintain protective measures for loggerhead sea turtles as well as a viable bottom longline fleet pending the implementation of Amendment 31 or alternative long-term mitigation measures. Alternatives evaluated in the environmental assessment include a (1)

no action alternative allowing the current emergency rule to expire, (2) an alternative to prohibit bottom longline fishing east of 85º30'W longitude for reef fish in waters shoreward of a line approximating the 35- fathom contour with a restriction of 1,000 hooks per vessel with no more than 750 hooks rigged at any given time, and (3) an alternative to extend the current emergency rule for another 186 days which prohibits bottom longline fishing east of 85º30'W longitude in waters shoreward of a line approximating the 50-fathom depth contour.

FINDING OF NO SIGNIFICANT IMPACTS

National Oceanic and Atmospheric Administration (NOAA) Administrative Order 216-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. The NMFS Instruction 30-124-1, July 22, 2005, Guidelines for the Preparation of a Finding of No Significant Impact (FONSI) was published to provide guidance. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. Section 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each Criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria, the recent Policy Directive from NOAA, and CEQ's context and intensity criteria. These include:

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

Response: No. Harvests of most target species are currently controlled by hard quotas, minimum size limits, bag limits, and trip limits, and it is unlikely that additional targeting of other species can be accomplished economically. Effective January 1, 2010, an Individual Fishing Quota (IFQ) will be implemented to manage the shallow water grouper (SWG) stock. Given that 70% of the harvest is composed of fish stocks that are managed under quotas, there is not expected to be an expansion of effort that would increase the opportunity for additional fishing mortality on target species. In fact, by reducing bottom longline effort, the proposed action will lessen fishing pressure and fishing mortality on some reef fish stocks (primarily grouper) in the eastern Gulf of Mexico (Gulf). Gag is currently undergoing overfishing, and restricting longline efforts for harvesting shallow water grouper could reduce fishing pressure on this species as well as other species undergoing overfishing such as red snapper, greater amberjack, and gray triggerfish.

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

Response: No. Incidental catch is usually made up of managed and non-managed species that are not known to be subject to excessive fishing pressure, e.g., grunts and porgies. As mentioned in Criterion 1, most of the harvest is composed of fish stocks managed under quotas (e.g., red snapper, shallow water grouper, and deepwater grouper) or by other means (minimum size limits, bag limits, and trip limits), thus any expansion of effort in this fishery jeopardizing the sustainability of non-target species is not expected. The reductions in longline effort will reduce the overall take of other non-target bycatch species susceptible to capture by bottom longline gear in the eastern Gulf. The proposed action is estimated to reduce loggerhead sea turtle mortality by 40% during the expected period of implementation relative to the status quo. The BiOp concluded that the continued authorization of the Gulf reef fish fishery was not likely to jeopardize the continued existence of any listed species.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH) as defined under the Magnuson Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act) and identified in FMPs?

Response: No. The proposed action is not reasonably expected to cause substantial damage to the ocean and coastal habitats or EFH. Reef fish fishing occurs in areas that have been identified as EFH for several managed species, and is conducted primarily with hook-and-line gear and longline gear. Longline gear is prohibited in vulnerable, nearshore habitats (inside of 50 fathoms west of Cape San Blas, Florida, and inside of 20 fathoms east of Cape San Blas, Florida). The proposed action, as described in Section 4.1 of the environmental assessment (EA), will limit the use of this gear in the eastern Gulf and is expected to provide a positive benefit to habitat in the area closed to longline gear. Vertical line gear is used within these areas and could damage coral or other hard bottom habitat if it becomes entangled within these structures, but these effects are minimal. However, the proposed actions are consistent with the enforceable provisions of the Coastal Zone Management programs of affected states, and are expected to have minor effects on the way fishing gear is currently used by the reef fish fishery as a whole. Some vessels already have converted from using bottom longline gear to vertical line gear, and additional vessel are expected to convert. This would benefit the physical environment as vertical gear is less damaging to the physical environment than bottom longline gear. As a result, the proposed actions are not expected to cause substantial damage to ocean and coastal habitats or EFH.

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

Response: No. The proposed action is not reasonably expected to have a substantial adverse impact on public safety or health. This action affects activities occurring onboard fishing vessels operating in the EEZ, and has no effect on safety or health of the general public. Recent fishery management actions such as the vessel monitoring system requirement and individual fishing quota programs have or will reduce the risks from fishing. The proposed action has the potential to move some longline vessels to deeper, more offshore waters which can be expected to increase the safety risks associated with operations at sea. However, longline fishermen have the alternative of converting to vertical line gear. Many vessels are expected to convert to vertical line gear and fish closer to shore which is expected to improve safety for fishery participants. 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).

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?

Response: No. The proposed actions are expected to reduce impacts considerably over the status quo operation of the fishery to endangered and threatened species, marine mammals, and any designated critical habitat of these species. As described in Section 4.2 of the EA, the action is estimated to reduce loggerhead sea turtle mortality by 40% during the expected period of

implementation relative to the status quo by reducing effort of commercial bottom longlining operations in areas commonly inhabited by sea turtles. In addition to the proposed action, recent regulations require vessels with commercial or for-hire reef fish permits to comply with sea turtle and smalltooth sawfish release protocols, possess a specific set of release gear, and adopt guidelines for the proper care for incidentally caught sawfish. These regulations are designed to benefit sea turtle and smalltooth sawfish populations by reducing discard mortality. 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.

The Gulf reef fish fishery is classified in the 2009 Marine Mammal Protection Act 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. The proposed action is not expected to alter existing fishing practices in the commercial sector of the fishery in such a way as to alter the fishery's interactions with marine mammals. Dolphins are the only species documented as interacting with this fishery. Bottlenose dolphins may feed on the bait, catch, or released discards of the reef fish fishery.

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

Response: No. There may be some expected benefits from the proposed action to biodiversity and ecosystem function resulting from reduced catch and effort in the area closed to longlining. However, given that the regulations are intended to be temporary, such benefits are not expected to be sufficiently substantial to influence biodiversity or ecosystem function within the affected area, in terms of altering benthic productivity, predator-prey relationships, or other ecological relationships.

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

Response: No. The proposed action would not create any significant social or economic impacts interrelated with natural or physical environmental effects. Prohibiting bottom longline effort inshore of the 35-fathom contour will have direct and indirect adverse social and economic impacts to that component of the reef fish fishery and to the shoreside operations that support this fishery. These impacts are described in Sections 4.3, 4.4, and 5.0 of the EA, and while not inconsequential, these impacts are not believed to be significant. Additionally, the impacts have been determined to not be significant for the purposes of EO 12866.

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

Response: No. The effects on the quality of the human environment are not likely to be highly controversial. The fishing industry questions the validity of the science involved in the estimates

of sea turtle takes by the bottom longline component of the reef fish fishery. Nevertheless, even the lower confidence bounds of the current take estimates as presented in Section 1.1 of the EA far exceed the take authorized in the 2005 BiOp. Therefore, as supported by the BiOp, there is little scientific controversy in regard to the need for the proposed action. There is also some controversy over the extent to which take has been exceeded and the extent to which reductions in sea turtle bycatch are necessary. However, the proposed actions are supported by the declining trends of loggerhead sea turtles showing significant reductions in fishery bycatch are needed and the new BiOp, which concluded the continued authorization of the Gulf reef fish fishery under the proposed actions is not likely to jeopardized the continued existence of any listed species.

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

Response: No. The proposed action is not reasonably expected to result in substantial impacts to unique areas, park land, prime farmlands, wetlands, wild and scenic rivers, EFH, or ecologically critical areas. Park land, prime farmlands, wetlands, wild and scenic rivers are inland and are not affected by this action in federal waters of the Gulf. Possible beneficial impacts to EFH are discussed in Question 3. Reef fish fishing occurs in or adjacent to ecologically sensitive areas, such as habitat areas of particular concern, marine sanctuaries, and marine reserves. While vertical gear used within these areas could adversely impact habitat if it became entangled within coral or other living bottom structures, the proposed actions are expected to have minor effects on the way fishing gear is currently used by the reef fish fishery as a whole. Some vessels are expected to convert from using bottom longline gear to vertical line gear. This would benefit the physical environment as vertical gear is less damaging to the physical environment than bottom longline gear. In regard to ecologically critical areas in the eastern Gulf, the Tortugas Marine Sanctuary is closed to fishing, Madison Swanson and Steamboat Lumps ecologically critical areas are closed to bottom fishing, and the Middle Grounds, which borders the 20-fathom contour is comprised of complex bottom structures, not conducive to longline fishing. Therefore, there would be no additional impacts on these components of the environment from the proposed action.

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

Response: No. The effects on the human environment are not likely to be highly uncertain or involve unique or unknown risks. This proposed action would limit the maximum number of rigged hooks on bottom longline vessels and prohibit longline fishing in waters shoreward of a line approximating the 35-fathom contour, east of Cape San Blas, Florida. This does not provide a unique risk; west of Cape San Blas, Florida, bottom longline gear has been prohibited in waters shallower than 50 fathoms for several years, and the effects of this action on the fishery are well documented. The 2009 BiOp concluded the continued authorization of the Gulf reef fish fishery is not likely to jeopardize the continued existence of any listed species.

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

Response: No. The proposed action is not related to other actions with individually insignificant but cumulatively significant impacts. The proposed action is related to proposed Amendment 31, in that it implements management measures similar to those contained in Amendment 31, and is intended to achieve similar objectives as Amendment 31 by reducing sea turtle interactions to an acceptable level. However, the proposed action is intended to be temporary and would be in place only until long-term management strategies are implemented through Amendment 31 or alternative long-term measures. Additionally, the impacts of the proposed action are not considered significant, and those impacts will be supplanted by the impacts from Amendment 31, not added to them. While the actions to be implemented pursuant to Amendment 31 have the potential to result in significant impacts, NOAA is currently in the process of developing an EIS to analyze the potential impacts, but has yet to make a final determination as to their likely significance. The proposed action will be effected by other measures currently being implemented in the reef fish fishery, such as the grouper and tilefish IFQ program. However, the implementation of the IFQ program (effective January 1, 2010) is expected to mitigate the adverse social and economic impacts expected to result for implementing restrictions to protect sea turtles. Longline fishermen suffering adverse impacts from the proposed action will simultaneously benefit from the dedicated access to fishery resources provided by the IFQ program.

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

Response: No. The proposed action does not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places nor is it expected to cause loss or destruction of significant scientific, cultural, or historical resources because they are not located in the affected area. The Tortugas Marine Sanctuary is already closed to fishing (see sections 3.1 and 3.4).

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

Response: No. The proposed action relates only to the harvest of existing resources, accordingly it is not reasonably expected to result in the introduction or spread of a non-indigenous species. For the same reasons, the proposed action is not expected to change the fishery in a way that would affect non-indigenous species or to result in habitat or ecosystem alterations in such a way that would promote the spread of non-indigenous species.

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

Response: No. The proposed action does not establish a precedent for future action with significant effects, and it does not represent a decision in principle about future considerations. The commercial grouper sector of the fishery is currently regulated through quotas, trip limits,

and other fishing restrictions including gear boundaries such as those proposed in this action. Effective January 1, 2010, an Individual Fishing Quota (IFQ) will be implemented to manage the shallow water grouper (SWG) complex. Measures in this proposed action are consistent with the long-term management strategy developed by the Council to address the issue of interactions between the fishery and sea turtles. Temporarily restricting a specific gear type from the fishery does not preclude affected vessels from converting to other gear types or shifting effort to alternative areas or species.

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

Response: No. The proposed action is being taken to ensure compliance with federal laws such as the Magnuson-Stevens Act and ESA, and is not reasonably expected to threaten a violation of other Federal, State, local law, or requirements imposed for the protection of the environment.

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

Response: No. The proposed action is not reasonably expected to result in cumulative adverse effects that will have a substantial effect on the target species or non-target species. By reducing bottom longline effort, this action could reduce fishing pressure on gag, which is undergoing overfishing, and is considered overfished, and provide lower fishing pressure on a variety of reef fish and non-targeted stocks (see section 4.8 for more information). The proposed action is estimated to reduce loggerhead sea turtle mortality by 40% during the expected period of implementation relative to the status quo.

DETERMINATION:
In view of the information presented in this document and the analysis contained in the supporting EA prepared for the final rule for the Gulf of Mexico reef fish fishery, it is hereby determined that this final rule will not significantly impact the quality of the human environment as described above and in the supporting EA. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

Regional Administrator
Southeast Regional Office
National Marine Fisheries Service

10/13/09
Date

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 (Magnuson-Stevens Act), 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 Magnuson-Stevens Act 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[2] 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)[3] 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.

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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 terms "destruction" or "adverse modification" refer to direct or indirect alterations that appreciably diminish the conservation value of critical habitat for listed species.

3 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.

On February 15, 2005, the Southeast Regional Office (SERO) completed the a 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 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. Based on catch and effort reported in the Coastal Fisheries Logbook Program (CFLP) which has been in place since 1992, and the Supplementary Discard Data Program which began in August 2001, 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. The 2005 BiOp relied on self-reported data which tend to be underreported. In addition, estimated sea turtle takes were extrapolated for the entire Gulf based only on reports from the eastern portion of the Gulf, resulting in a lower number of anticipated sea turtle takes (NMFS 2005). 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 BiOps 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 Southeast Fisheries Science Center (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 for which the RFEM was assumed a representative sample and included with the RFOP and SBLOP; 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 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 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. 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 (Appendix B; NMFS-SEFSC 2008).

A number of stock assessments (TEWG 1998; TEWG 2000; NMFS 2001; Heppell et al. 2003) 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 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 (Appendix B; 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).

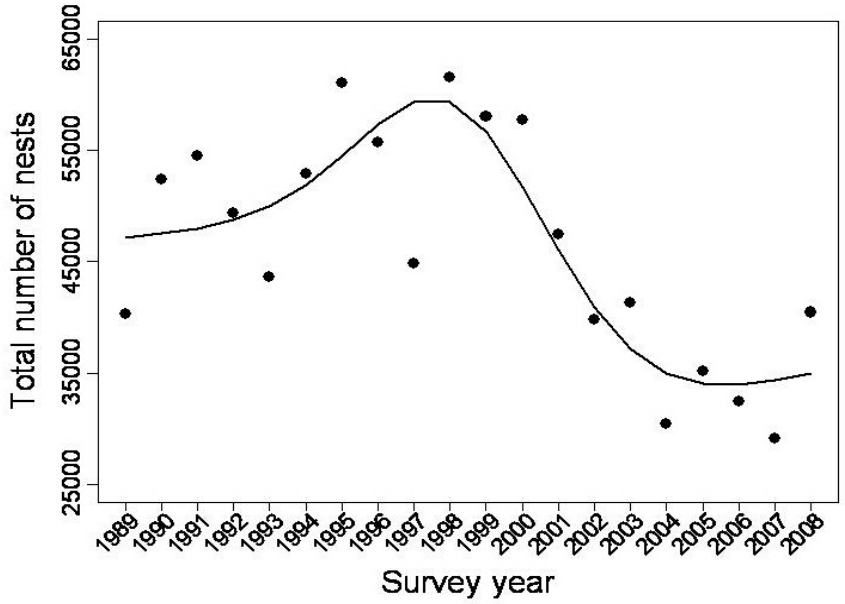


Figure 1.1.1 Annual total nest counts for loggerhead sea turtles on Florida Index beaches, 1989-2008. The trend line was estimated by fitting a five-knot restricted cubic spline curve to the total counts via negative binomial regression (Appendix B; Witherington et al. 2009).

On September 3, 2008, NMFS reinitiated ESA section 7 consultation on the reef fish fishery. In addition, 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 developed long-term measures through Amendment 31 and associated Environmental Impact Statement (EIS).

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 of Mexico inside of 50 fathoms, and prohibited all longline fishing in the eastern Gulf of Mexico once the deepwater grouper and tilefish commercial quotas were filled. This emergency rule, unless renewed, will expire on October 29, 2009. Subsequently, the Council approved at their August 2009 meeting 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 of Mexico reef fish fishery. The measures selected as preferred in Amendment 31 were to: Prohibit the use of bottom longline gear shoreward of a line approximating the 35 fathom depth contour from June through August; establish a reef fish longline endorsement; and limit the number of hooks per longline vessel to 1,000, of which 750 can be rigged for fishing.

Amendment 31 to the FMP for the Reef Fish Resources of the Gulf was approved by the Council in August 2009; however, the NMFS has not yet approved or implemented the amendment. The preferred actions consist of a depth area closure shoreward of a line approximating the 35-fathom contour during June through August, a hook limitation of 1,000 hooks per bottom longline vessel with no more than 750 rigged for fishing at any given time, and a 40,000 lb qualification endorsement based of the 1999-2007 period. These actions are estimated to reduce the bycatch of sea turtles and the overall bottom longline fishing effort by approximately 60% relative to the 2007-2008 baseline effective effort levels. If approved, Amendment 31 could not likely be implemented before May 2010.

In October 2009, NMFS completed a BiOp on the continued authorization of the Gulf reef fish fishery, as managed under the Reef Fish FMP. The BiOp considered all Reef Fish FMP amendments implemented to date, as well as the actions included in this rule and actions 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 ITS was issued specifying the amount and extent of anticipated take on a three-year basis, along with reasonable and prudent measures and associated terms and conditions deemed necessary and appropriate to minimize the impact of these takes.

Short-term action is needed to reduce sea turtle bycatch following expiration of the emergency rule and pending implementation of Amendment 31 or alternative long-term mitigation measures. The intended effect of this action is to maintain adequately protective measures for loggerhead sea turtles in compliance with the ESA as well as a viable bottom longline fleet until long-term measures are approved and implemented.

1.2 Purpose and Need for Action

The results of a recent SEFSC observer analysis completed in April 2009 (NMFS-SEFSC, 2009) indicated 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. Therefore, action is needed to provide protection for threatened loggerhead sea turtles in compliance with ESA.

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.

The measures implemented through the emergency rule have effectively ended reef fish longline fishing in the eastern Gulf of Mexico until the deepwater grouper and tilefish fishing year starts January 1, 2010. This has caused economic hardship for industry. Should the current emergency rule be renewed until regulations developed in Amendment 31 or other long-term mitigation measures are implemented, this economic hardship will continue as most effort conducted by the fishery is targeted at shallow water grouper (SWG) species. Since the emergency rule was implemented, further analyses of alternatives to address hardshell sea turtle take by the bottom longline component of the reef fish fishery has continued through the development of Amendment 31. Some of these alternatives would allow bottom longline operations to continue at some reduced level, while providing adequate protection for threatened sea turtle species. Therefore, the purpose of the proposed rulemaking is to balance the continued operation of the bottom longline component of the reef fish fishery while maintaining adequately protective measures for loggerhead sea turtles as well as a viable bottom longline fleet pending implementation of long-term mitigation measures.

2.0 MANAGEMENT ALTERNATIVES

Section 1502.14 of the Council on Environmental Quality (CEQ) regulations requires agencies to explore and objectively evaluate all reasonable alternatives for an action, including the no action alternative. The analysis of alternatives shall describe the environment to be affected by the action and the environmental consequences of each of the alternatives (Part 1502.14, CEQ, Accessed on October, 1, 2009). Alternatives shall be presented in comparative form to provide a clear basis for why decision makers selected the preferred alternative(s).

Three alternatives are being considered in this EA. Descriptions of the environmental consequences associated with each alternative can be found in Section 4.0. Section 3.0 describes the physical, biological, economic, social, and administrative environments affected by this action. Sections 4.3 and 5.0 provide a detailed discussion of the economic impacts of this action.

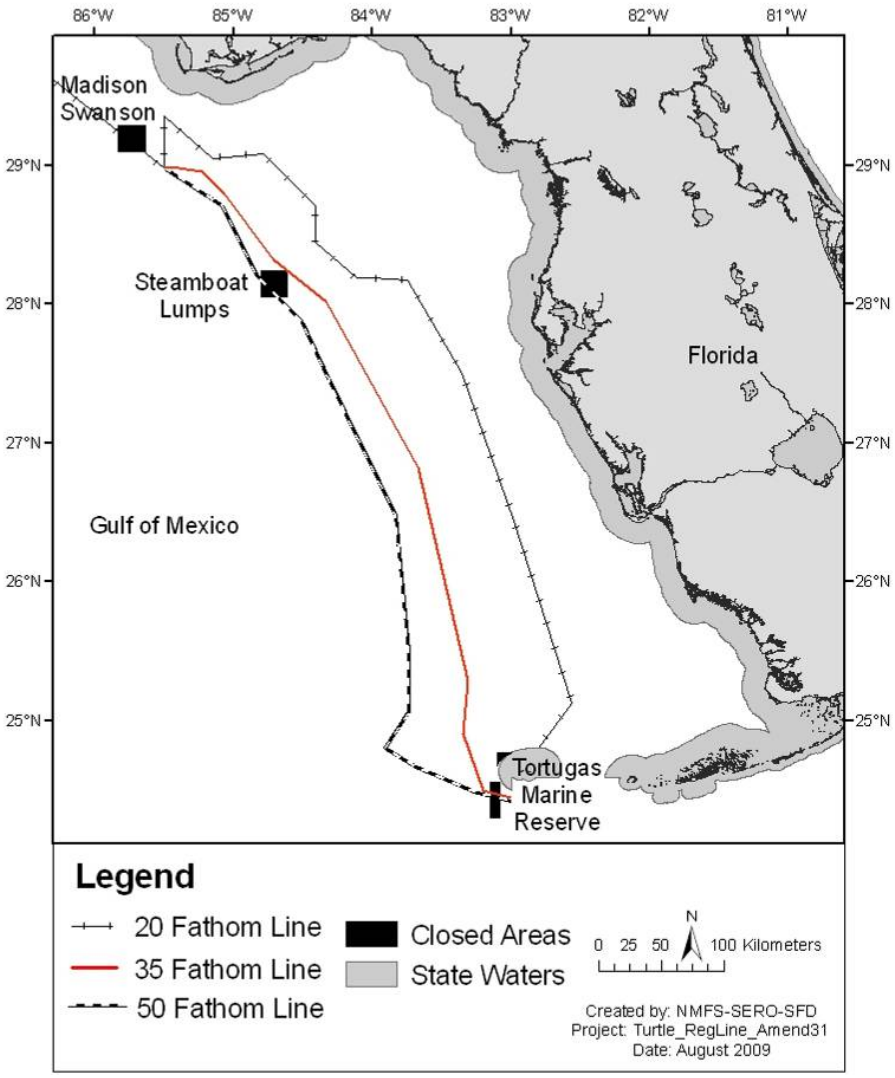
Action: Restrict bottom longline fishing for reef fish in the eastern Gulf of Mexico.

Alternative 1 – No Action. Allow the bottom longline emergency rule to expire October 29, 2009. This would prohibit bottom longline fishing for reef fish, subject to quota restrictions, east of 85°30'W (near Cape San Blas, FL) in waters shoreward of the 20-fathom depth contour and west of 85°30'W in waters shoreward of a line approximating the 50-fathom depth contour.

Preferred Alternative 2 –. Terminate the reef fish bottom longline emergency rule and implement a rule regulating the use of bottom longline gear targeting reef fish east of 85°30'W (near Cape San Blas, FL). This rule would limit the number of hooks per vessel to a total of 1000 hooks of which no more than 750 can be rigged for fishing or fished at any given time. Additionally, this rule would prohibit the use of bottom longline gear targeting reef fish shoreward of a line approximating the 35-fathom depth contour.

Alternative 3 – Extend the bottom longline emergency rule for another 186 days. This would prohibit bottom longline fishing for reef fish east of 85°30'W (near Cape San Blas, Florida) in waters shoreward of a line approximating the 50-fathom depth contour unless the quota for deepwater grouper and tilefish are filled, in which case the use of reef fish bottom longline gear would be prohibited in all waters east of 85°30'W. Reef fish bottom longline fishing would continue to be allowed west of 85°30'W in waters greater than 50 fathoms

Figure 2.1. Map representing the regulation lines associated with the 20-fathom (Alternative 1), 35-fathom (Preferred Alternative 2), and 50-fathom (Alternative 3) boundaries for the bottom longline component of the commercial reef fish fishery.



In section 4.0, three alternatives are evaluated for their environmental impact and represent a reasonable range of alternatives for consideration. **Alternative 1** (no action) which would allow the current emergency rule to expire and allow the bottom longline component of the Gulf reef fish fishery to operate within past constraints (i.e., outside of 20 fathoms). This alternative would provide little or no protection to hardshell sea turtles and would provide the largest economic benefit to the fishery. **Alternative 3** which would continue the emergency rule and effectively not allow reef fish longline fishing in the Gulf until January 1, 2010, when limited fishing primarily targeting deepwater grouper and tilefish would be allowed in waters in excess of 50 fathoms until the respective quotas are filled. This alternative would bring the bottom longline component of the reef fish fishery of the eastern Gulf in line with the 50-fathom closure applied to the rest of the Gulf, provide the greatest protection to hardshell sea turtles, and have the most adverse economic effect on the bottom longline component of the reef fish fishery.

Alternative 2 is designed to be as consistent as possible with the long-term mitigation measures proposed by the Council in Amendment 31, which were reviewed in the 2009 BiOp and will soon be submitted to NMFS for review and approval. Amendment 31 proposes the following actions to reduce sea turtle take by the bottom longline component of the reef fish fishery: (1) A prohibition on the use of bottom longline gear in the reef fish fishery east of Cape San Blas, Florida, shoreward of a line approximating the 35-fathom depth contour from June through August; (2) a reduction in the number of bottom longline vessels operating in the fishery through an endorsement provided only to longline vessel permits with a demonstrated history of landings, on average, of at least 40,000 pounds of reef fish annually with fish traps or longline gear during 1999-2007; and (3) restriction of the total number of hooks that may be possessed onboard each bottom longline vessel to 1,000, only 750 of which may be rigged for fishing at any given time.

Alternative 2 omits the seasonal element from the 35-fathom depth prohibition to compensate for the inability to expedite implementation of the proposed permit endorsement. Due to the intended short-term nature of the proposed rulemaking, season-area closures and longline endorsement requirement alternatives are impractical. The season-area closures evaluated in Amendment 31 were set to occur during the summer months when sea turtle takes were observed to be highest. As previously discussed, because Amendment 31 will likely be implemented by May 2010, these measures would not have time to take effect. By incorporating the season area closure into the preferred actions, the effect of the closure would begin to accrue immediately rather than only during the summer. For the longline endorsement, landings records would need to be evaluated and endorsements awarded to qualifying reef fish permit owners. This process would take several months and would not be complete until close to when the final rule for Amendment 31 or alternative long-term mitigation measures are implemented.

The conservation and economic impacts of **Alternative 2** would be intermediate to those of **Alternatives 1 and 3**. Together with the emergency rule, Alternative 2 is estimated to obtain the same reduction in sea turtle mortality as Amendment 31 (60% relative to the 2007-2008 baseline) through the expected period of implementation. The proposed action's consistency with Amendment 31 and should reduce the regulatory burden to the fishery should the final rule for Amendment 31 be approved and implemented.

The Council also considered other alternatives contained in Amendment 31 as possible short-term measures for the proposed rulemaking, but rejected many of these alternatives from further analysis for several reasons. Several of the alternatives were rejected because there was little evidence that the measures would reduce hardshell sea turtle take and the degree of bycatch reduction was unknown. These include alternatives to prohibit the use of squid for bait, limit the length of a longline, and limit gangion lengths. Other alternatives were rejected because the magnitude of hardshell sea turtle take reduction was very similar to other alternatives. For example, the estimated reductions in sea turtle take between prohibiting longline gear inside of 30 fathoms versus 35 fathoms (**Alternative 2 in Amendment 31**) were 71% and 76%, respectively, and assuming no

shifting effort from one gear to another, would reduce the annual number of trips by 619 and 762, respectively (GMFMC 2009). Setting the line at 40 fathoms resulted in estimated reductions in take and effort that were very similar to 50 fathoms (**Alternative 3 in Amendment 31**). These were 90% and 95%, and 905 and 1,022 trips, respectively (GMFMC 2009).

3.0 AFFECTED ENVIRONMENT

A brief description of the affected environment is included herein for this EA. More detailed descriptions of the affected environment can be found in the EIS to the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004a) and Secretarial Amendment 1 to the Reef Fish FMP (NMFS 2004a), and are incorporated herein by reference.

3.1 Physical Environment

The fishery occurs throughout the Gulf, but the fishing effort targeting grouper is primarily concentrated on the west Florida continental shelf. Most landings of red grouper, caught primarily by the bottom longline component of the reef fish fishery, and other shallow water grouper (SWG) (includes scamp, gag, rock hind, red hind, red, black, yellowfin, and yellowmouth groupers) occur off of Florida over hard-bottom habitat. This habitat is described in detail in GMFMC (2004a). Deepwater grouper (DWG) (includes speckled hind, yellowedge, snowy, misty, and warsaw groupers) occur near the shelf-edge over sand, mud and shell bottom in the eastern Gulf and are harvested over rocky ridges or flat bottom, near banks or 'lumps' in the western Gulf (Cass-Calay and Bahnick 2002).

The Gulf is bounded by Cuba, Mexico, and the United States, and has a total area of 564,000 km^2. Continental shelves occupy about 35% of the total Gulf. The west Florida shelf, which would be affected by this action, provides a large area of hard bottom habitat described in detail in GMFMC (2004a). It is comprised of low relief hard bottoms that are relict reefs or erosional structures. Some high relief can be found along the shelf edge in water depths of 130 to 300 m. Hard bottom, important reef fish fishing area, also provides extensive areas for the recruitment of reef biota such as corals.

3.2 Biological Environment

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

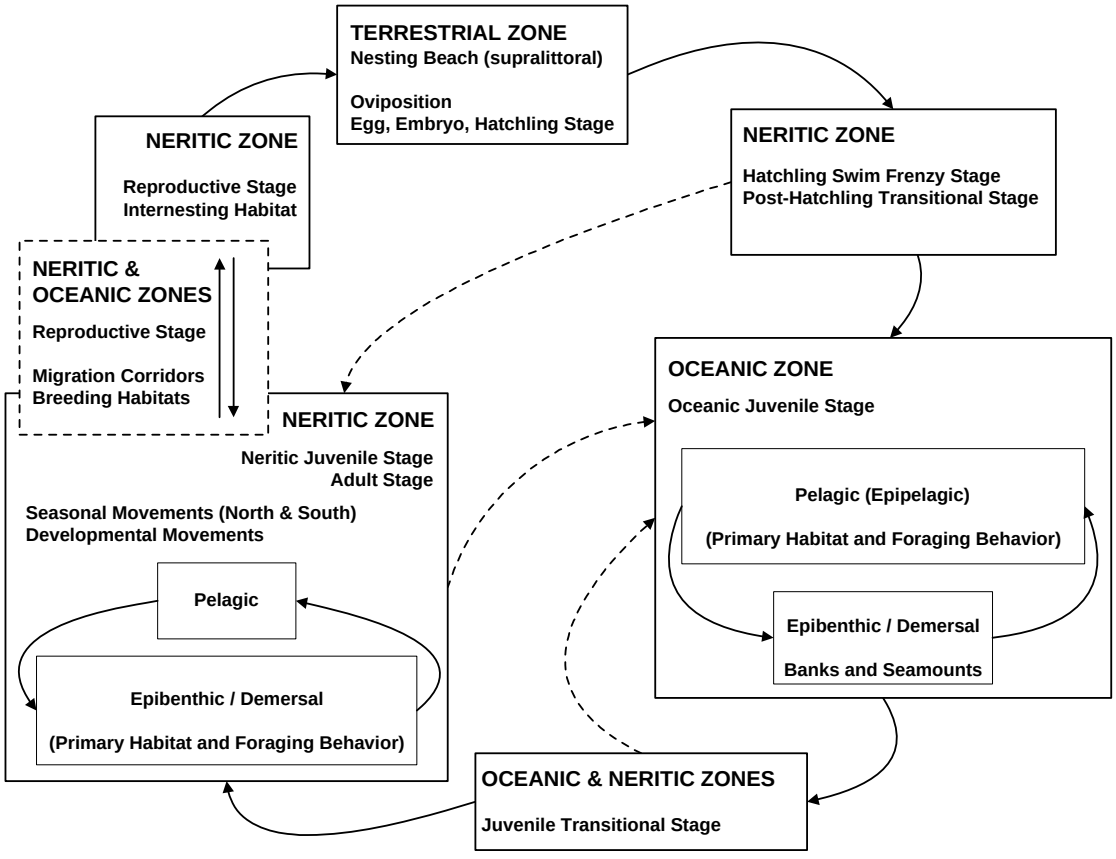
3.2.1 Biology and Life History – Sea Turtles

Sea turtles, air-breathing reptiles with streamlined bodies and large flippers, are well adapted to life in the marine environment. They inhabit tropical and subtropical oceans throughout the world. Of the seven species of sea turtles, five are typically found in U.S. waters: Green, hawksbill, Kemp's ridley, leatherback, and loggerhead.

Although sea turtles live most of their lives in the ocean, adult females must return to beaches on land to lay their eggs. They often migrate long distances between foraging grounds and nesting beaches. Figure 3.1 depicts the generalized life history of the North Atlantic loggerhead sea turtle, the species most frequently caught on reef fish bottom longlines. Loggerhead sea turtles occupy three different ecosystems during their lives--

the terrestrial zone[4], the oceanic zone[5] and the neritic zone[6]. 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 oceanic zone, or (3) benthic or demersal, if they are on the sea floor in either the neritic zone or oceanic. Sea turtle life history is generally described by five life stages: hatchling, post-hatchling, oceanic juvenile, neritic juvenile, and adult (reproductive stage). NMFS and USFWS (2008), Tables 3.2.1 and 3.2.2, 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 United States.

Figure 3.2.1. Generalized life history of North Atlantic loggerhead sea turtles (Bolten 2003 in NMFS 2008).



4 the nesting beach where both oviposition (egg laying) and embryonic development and hatching occur
5 The oceanic zone includes the vast open ocean environment (from the surface to the sea floor) where water depths are greater than 200 meters.
6 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

Table 3.2.1. Typical values of life history parameters for loggerhead sea turtles nesting in the U.S. Excerpted from the Recover Plan for the Northwest Atlantic Population of the Loggerhead Sea turtle, Second Edition (NMFS and USFWS 2008)

Life History Parameter	Data
Clutch size	100-126 eggs[1]
Egg incubation duration (varies depending on time of year and latitude)	42-75 days[2,3]
Pivotal temperature (incubation temperature that produces an equal number of males and females)	29.0˚C[5]
Nest productivity (emerged hatchlings/total eggs) x 100 (varies depending on site specific factors)	45-70%[2,6]
Clutch frequency (number of nests/female/season)	3-5.5 nests[7]
Internesting interval (number of days between successive nests within a season)	12-15 days[8]
Juvenile (<87 cm CCL) sex ratio	65-70% female[4]
Remigration interval (number of years between successive nesting migrations)	2.5-3.7 years[9]
Nesting season	late April-early September
Hatching season	late June-early November
Age at sexual maturity	32-35 years[10]
Life span	>57 years[11]

1 Dodd 1988.
2 Dodd and Mackinnon (1999, 2000, 2001, 2002, 2003, 2004).
3 Blair Witherington, FFWCC, personal communication, 2006 (information based on nests monitored throughout Florida beaches in 2005, n=865).
4 NMFS (2001); Allen Foley, FFWCC, personal communication, 2005.
5 Mrosovsky (1988).
6 Blair Witherington, FFWCC, personal communication, 2006 (information based on nests monitored throughout Florida beaches in 2005, n=1,680).
7 Murphy and Hopkins (1984); Frazer and Richardson (1985); Ehrhart, unpublished data; Hawkes et al. 2005; Scott 2006; Tony Tucker, Mote Marine Laboratory, personal communication, 2008.
8 Caldwell (1962), Dodd (1988).
9 Richardson *et al*. (1978); Bjorndal *et al*. (1983); Ehrhart, unpublished data.
10 Melissa Snover, NMFS, personal communication, 2005; see Table A1-6.
11 Dahlen *et al*. (2000).

Table 3.2.2. Reported size distributions, stage durations, annual survival probabilities, and growth rates for loggerhead sea turtles nesting in the U.S. See citations for details regarding values reported. Excerpted from the Recover Plan for the Northwest Atlantic Population of the Loggerhead Sea turtle, Second Edition (NMFS and USFWS 2008).

Life Stage	Size (Curved Carapace Length)	Stage Duration	Annual Survival Probabilities	Growth Rate
Hatchling	4 cm CCL[1]	1-5 days[2]	Year 1 = 0.7[3,6]	--
Post-hatchling	4-6 cm CCL[4]	<6 months[5]		10.8 cm/yr[5]
Oceanic juvenile	8.5-64 cm CCL[5,7]	7-11.5 years[8]	0.9[6,9]	2.9-5.4 cm/yr[10]
Neritic juvenile	46-87 cm CCL[11]	13-20 years[12]	0.7-0.8[13]	1.8-2.1 cm/yr[14]
Adult female	>87 cm CCL[1,15]	>25 years[16]	0.9[6,17]	0.6 cm/yr[18]
Adult male	>83 cm CCL[19]	--	--	0.1 cm/yr[20]

1 Ehrhart (1980).
2 Duration from hatching out of the egg until entering the water.
3 Hatchling and post-hatchling stages are combined because estimates of survival probabilities from stage-based models are based on annual rates; these two stages occur within the first year. Stage based survival estimates are based on similar size classes used in the matrix population models (Heppell *et al*. 2003) and differ slightly with those presented in this table, which are based on empirical data.
4 Blair Witherington, FFWCC, personal communication, 2006.
5 Bjorndal et al. (2000).
6 Heppell et al. (2003).
7 Bjorndal et al. (2003b).
8 Bjorndal et al. (2003a) (7 years: 8.5-46 cm CCL; 11.5 years: 8.5-64 cm CCL).
9 Bjorndal et al. (2003b) (estimated annual survivorship for years 2-6).
10 Snover (2002) (mean 2.9 cm SCL/yr); Bjorndal et al. (2003a) (mean 5.4 cm CCL/yr).
11 Bjorndal et al. (2001).
12 Bjorndal et al. (2001) (13 years: 64-87 cm CCL; 20 years: 46-87 cm CCL).
13 Heppell et al. (2003b).
14 Bjorndal et al. (2001) (mean = 1.8 cm CCL/yr (64-87 cm CCL); mean = 2.1 cm CCL/yr (46-87 cm CCL)); Snover (2002) (mean = 2.1 cm SCL/yr (45.1-80.6 cm SCL)).
15 Witherington (1986), Byrd et al. (2005).
16 Dahlen et al. (2000).
17 Hedges (2007).
18 Bjorndal et al. (1983).
19 Schroeder, unpublished data from Florida Bay (based on tail lengths >40 cm from plastron to tip of tail).
20 Schroeder, unpublished data from Florida Bay.

3.2.2 Biology and Life History – Reef Fish

NOAA's National Ocean Service (NOS) collaborated with NMFS and the Council to develop distributional information for reef fish (and other species) in the Gulf (SEA 1998). 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 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 only as 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. Information on habitat types and life history stages can be found in detail in GMFMC (2004a) and in a summarized format in GMFMC (2008a). In general, both eggs and larval stages are planktonic. Larvae feed on zooplankton and phytoplankton. Exceptions to these generalizations include gray triggerfish that lay their eggs in depressions in the sandy bottom, and gray snapper whose larvae are found around submerged aquatic vegetation. 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 associated with sand and soft-bottom substrates. Juvenile red snapper are commonly associated with mud bottom habitat in the northern Gulf, particularly off Texas through Alabama. 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 utilizing 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).

3.2.3 Status of Reef Fish Stocks

The Reef Fish FMP currently encompasses 42 species. 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). 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 2009) 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. 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.

3.2.4 Status of Protected Resources

There are 28 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 *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]). Information on the distribution, biology, and abundance of these protected species in the Gulf is included in final EIS to the Council's Generic EFH amendment (GMFMC, 2004a), the February 2005 BiOp on the reef fish fishery (NMFS 2005) and *Acropora* Status Review (*Acropora* Biological Review Team 2005). Marine Mammal Stock Assessment Reports and additional information are also available on the NMFS Office of Protected Species Web site: 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 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. 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.

Smalltooth sawfish are also affected by the Gulf reef fish fishery, but to a much lesser extent. Smalltooth sawfish primarily occur in the Gulf off peninsular Florida. Incidental captures in the commercial and recreational hook-and-line components of the reef fish fishery are rare events, with only eight smalltooth sawfish 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. The long, toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in fishing gear.

All five species of sea turtles are adversely affected by the Gulf reef fish fishery. Incidental captures are relatively infrequent for most gears, but occur in all commercial and recreational hook-and-line components of the reef fishery. Captured sea turtles can be released alive or can be found dead upon retrieval of the gear as a result of forced

submergence. Sea turtles 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 minimize post-release mortality.

Loggerhead Sea Turtle

The loggerhead sea turtle was listed as a threatened species throughout its global range on July 28, 1978 (43 FR 32800). 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 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 United States Fish and Wildlife Service (USFWS) (2008) 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 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 are transported by ocean currents farther offshore, they enter 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

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.

the Azores and Madeira spend the majority of their time in the top 15 feet (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., The 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 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. A more detailed description of this sector is provided in NMFS (2009d) and is incorporated herein by reference. The following sections contain a summary of this information.

The major sources of data on the commercial reef fish fishery are 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 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 and to harvest commercial quantities of reef fish a vessel requires a valid commercial reef fish permit on board. On September 21, 2009, there were a total of 911 active and renewable commercial reef fish permits.

Figures 3.3.1 and 3.3.2 show annual landings and value of gag, red grouper, all SWG, and all reef fish for 1993-2006. Landings and value were variable but generally increasing from 1993 through 2004, but declined for gag and all SWG in 2005 and 2006.

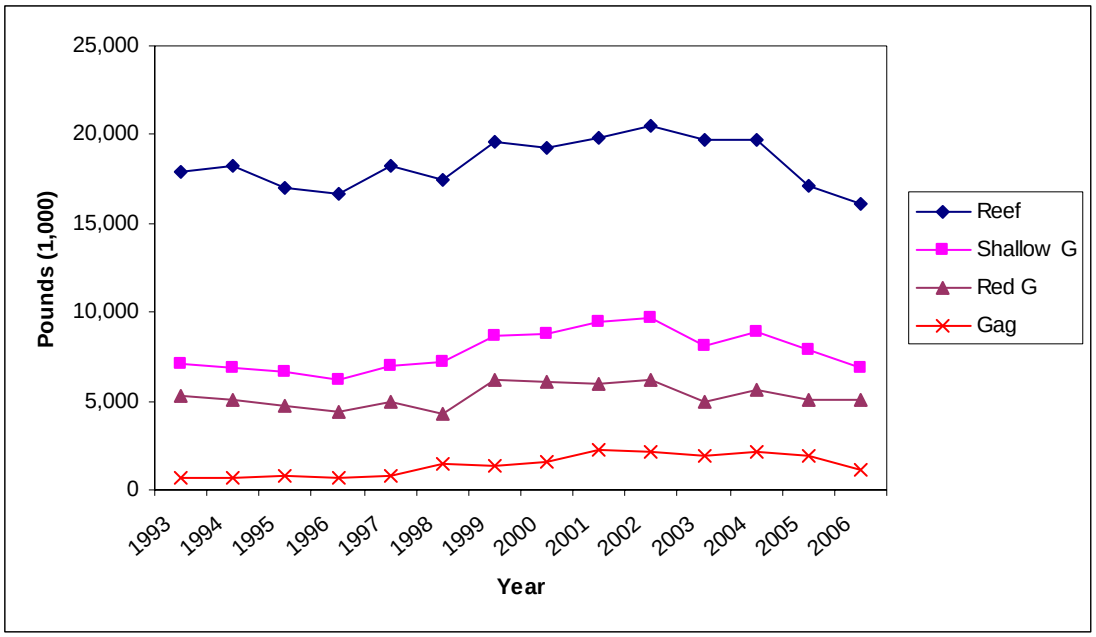


Figure 3.3.1. Landings of selected species, 1993-2006.

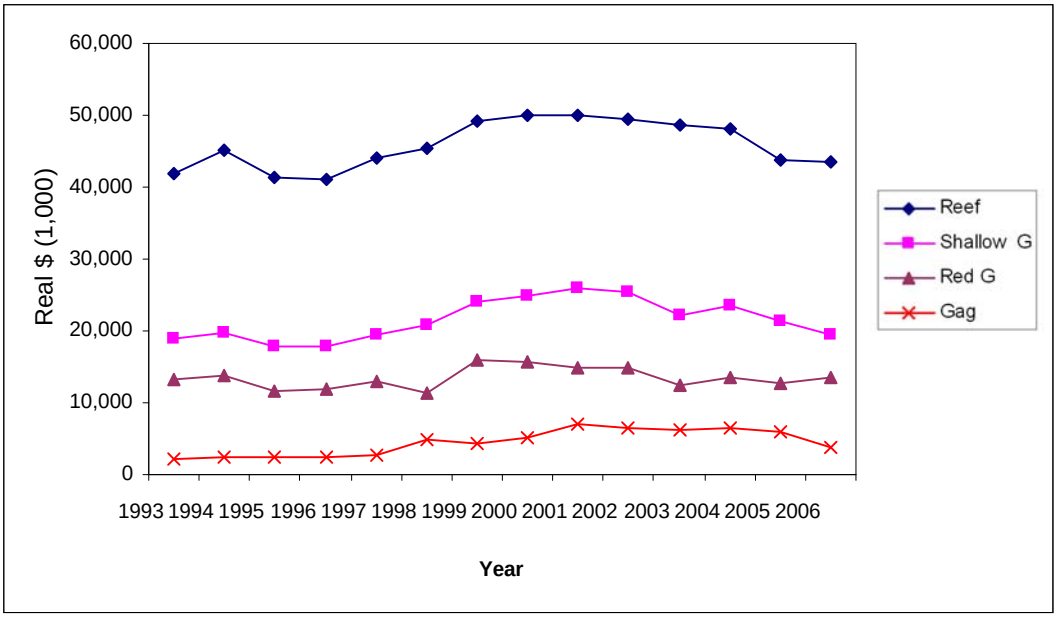


Figure 3.3.2. Real ex-vessel values (2006 dollars) for selected species, 1993-2006.

Average annual landings and value estimates are provided in Table 3.3.1. Over the 1993-2006 period, an annual average of 7.82 mp of SWG, 1.17 mp of DWG, and 0.52 mp of tilefish was landed. The respective ex-vessel values for these harvests were $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.

Table 3.3.1 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 3.3.2 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. 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. The number of boats actively participating in the reef fish fishery (except for gag) has shown a pattern of decline from 1993-2006.

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 3.3.2). The average annual number of trips landing at least one pound of the selected species over the entire 1993-2006 period was 6,627 for red grouper, 4,825 for gag, 9,860 for all SWG, 2,144 for DWG, 834 for tilefish, and 14,698 for all reef fish.

The general conclusion of an examination of these measures as proxies 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 1999-2004. Potential reasons for the decline in effort include an increase in fishing cost (particularly fuel), an increase in harvesting efficiency, more restrictive regulations particularly concerning the grouper species, and changes in stock status.

Table 3.3.2 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

Average annual monthly landings are provided in Figure 3.3.3. Landings for all reef fish increase in February and March, then decline, except for October, the rest of the year. The monthly patterns for all SWG and red grouper are similar due to the dominance of red grouper in total SWG harvests, declining from January through March, rising then declining fall through the next two quarters (April-June and July-September), and remaining relatively flat in the last quarter (October-December). Gag landings show little variability over the course of the entire year. For all groups, there is a perceptible landings increase in October compared to September.

For the period 1993-2006, reef fish landings averaged 1.5 million pounds per month, ranging from 1.1 million pounds to 1.8 million pounds; SWG landings averaged 652 thousand pounds per month, ranging from 520 thousand pounds to 800 thousand pounds; red grouper landings averaged 440 thousand pounds per month, ranging from 301 to 572 thousand pounds; and for gag averaged 116 thousand pounds per month, ranging from 73 to 170 thousand pounds.

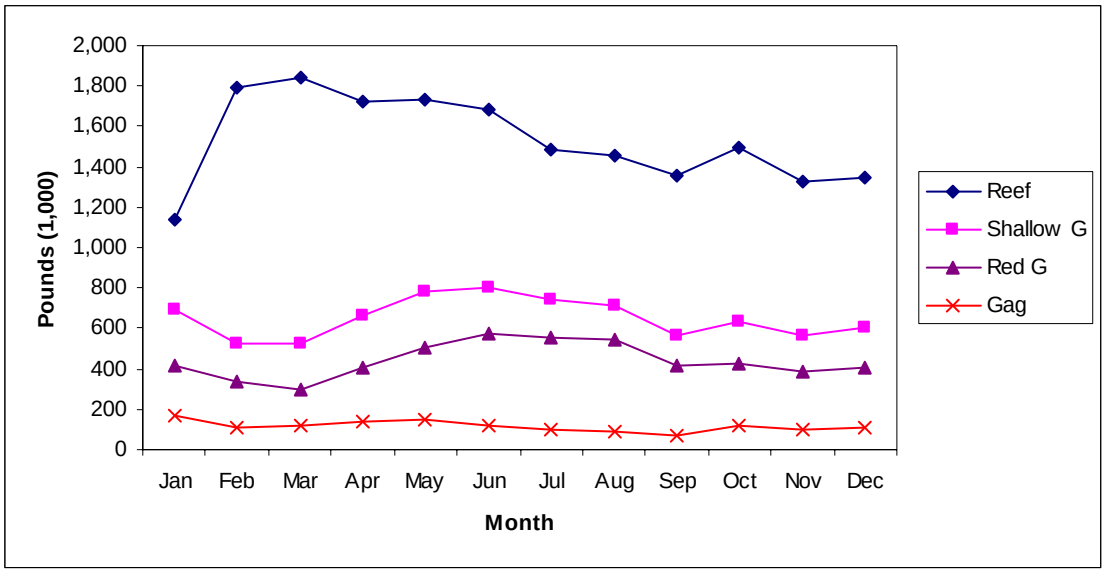


Figure 3.3.3 Average monthly landings (thousand pounds) of selected species, 1993-2006.

Monthly average real prices for reef fish, SWG, gag, and red grouper for 1993-2006 are provided in Figure 3.3.4. All average prices reached a peak in March, steadily falling through June, gradually rising through October, and falling slightly in November and December. Gag commanded the highest prices in all months, followed by SWG, and then by red grouper and reef fish. The monthly average price for gag was $3.20 per pound, for red grouper $2.58 per pound, for all SWG $2.77 per pound, and for all reef fish $2.49 per pound.

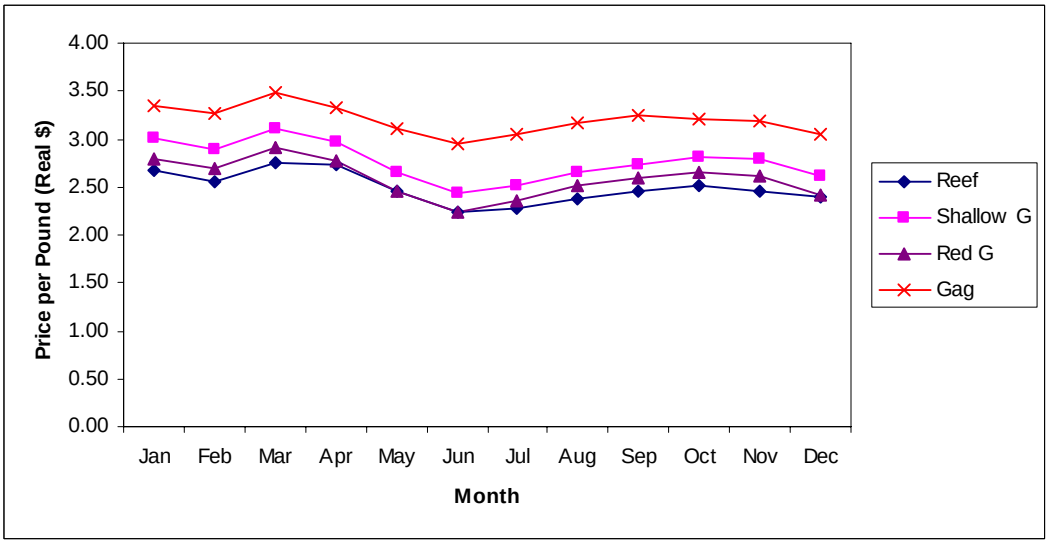


Figure 3.3.4 Average monthly price per pound (adjusted for inflation) of selected species, 1993-2006.

Fishery Performance by Gear Type

Average annual harvest by gear type for 1993-2006 is provided in Table 3.3.3. Vertical/handlines and longlines are clearly the dominant gear types. Traps have been prohibited for use in the harvest of reef fish since February 2007.

Table 3.3.3 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

Information on fishery performance by area for 1993-2006 is provided in Table 3.3.4. 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.

For the period 1993-2006, West-Central FL led all other areas in the red grouper average annual landings. For gag, AL-TX had the highest average annual landings, however, 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. For DWG, AL-TX led all areas. Again, however, the combined DWG landings of all Florida areas outweighed those of AL-TX. For tilefish, AL-TX led all areas in landings. As would be expected, the distribution of average annual revenues by area mirrors that of landings.

Table 3.3.4 Average annual fishery performance by area (landing port location), 1993-2006. 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.

	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

Average annual harvests by species or species complex are provided in Table 3.3.5. 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 3.3.5, SWG species were the dominant harvest for trips landing at least one pound of SWG, while the dominant species group for trips landing at least one pound of DWG was snappers and more SWG were caught on those trips than DWG. Within the SWG group, red grouper was clearly the dominant species.

Table 3.3.5 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

Vessels by Landing Categories

Table 3.3.6 presents the number of vessels by average landing category (pounds of fish landed), by gear type, for trips landing at least one pound of grouper or tilefish. The largest number of longline vessels fall into the largest landing categories.

Table 3.3.6. Number of unique vessels (totals over all years) by average landing category, by gear type, for trips landing at least one pound of grouper or tilefish, 1993-2006 and 1999-2004.

Category	Diving	Handlines	Longlines	Other Gear	Traps	Troll
1993-2006						
1-499 lbs	126	963	39	103	62	191
500-999 lbs	29	247	23	15	22	31
1000-3999 lbs	52	535	48	27	33	35
4000-9999 lbs	18	318	33	14	27	3
10000-49000 lbs	14	459	83	4	43	0
=> 50000 lbs	2	202	208	0	60	0
1999-2004						
1-499	74	437	17	26	13	115
500-999	9	131	11	3	4	14
1000-3999	30	308	26	11	9	17
4000-9999	12	236	20	6	6	2
10000-49000	7	310	51	2	25	0
=> 50000	0	112	146	0	36	0

Reef Fish Dealers

As of September 15, 2009, there were 170 active Gulf reef fish dealers 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).

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 fishery are drawn from estimates of the 2006 commercial grouper and tilefish landings and value data for the Gulf reef fish

fishery. This information was originally provided in Amendment 30B (GMFMC 2008a). The total 2006 output (sales) impacts of the commercial grouper and tilefish landings 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 full-time employment (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 of the reef fish fishery due to potential differences in methodology.

Imports

Imports of snappers and groupers into the United States are summarized in Table 3.3.7. Imports steadily increased over the 1993-2006 period, 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. 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, peaking at $101.7 million in 2006. The value of domestic production during this period rose slightly in the first years but declined after reaching its peak of $50.1 million in 2001 and in 2006 the value of domestic reef fish production stood at $43.5 million, which is less than half of that of imports.

Table 3.3.7 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 rule is only concerned with the commercial sector of the 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).

3.4 Description of Social Environment

The communities that would most likely be affected by actions within this proposed rulemaking are shown in Figure 3.4.1 and were selected through discussions with industry representatives. While the majority of vessels that fished the area where interactions with sea turtles occurred are from the west-central Florida coast, actions here will have impacts on all longline operations in the eastern Gulf. 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 also be affected by actions included here. For this description of communities, however, the focus will be on those communities where a large portion of the fishing effort is derived.

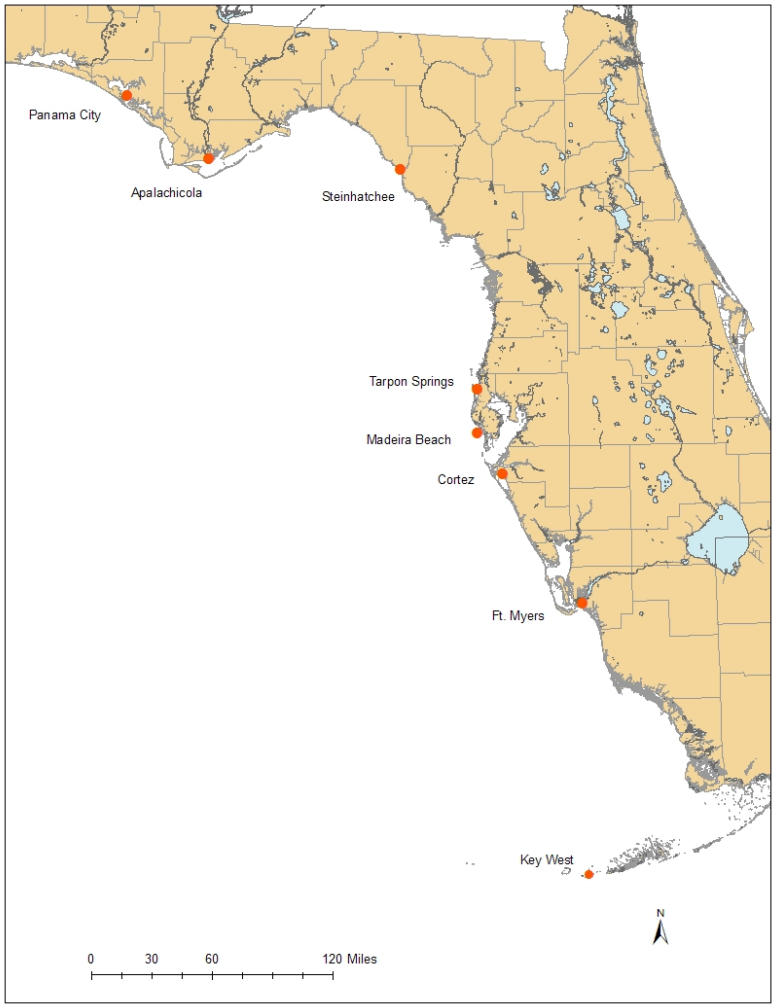


Figure 3.4.1 Florida communities identified by industry representatives as potentially affected by actions within the Amendment 31 (R. Spaeth and K. Bell, industry representatives, personal communication).

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 Program 2009; North Carolina Sea Grant 2007). The process of "gentrification" which tends to push those of 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 disappearance 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 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

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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.

2007 and in some cases 2008. 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.

The majority of SWG landings are concentrated along Florida's west central coast in Pinellas and Manatee Counties as seen in Figures 3.4.2 and 3.4.3. Other areas of the state with less concentrated landings are in the Panama City, Apalachicola, and Steinhatchee. The following discussion will focus on the two counties with the most landings and communities involved in the harvest of SWG in the reef fish fishery with an emphasis on those with bottom longline vessels. There will be limited discussion on those communities less involved in the fishery and gear type.

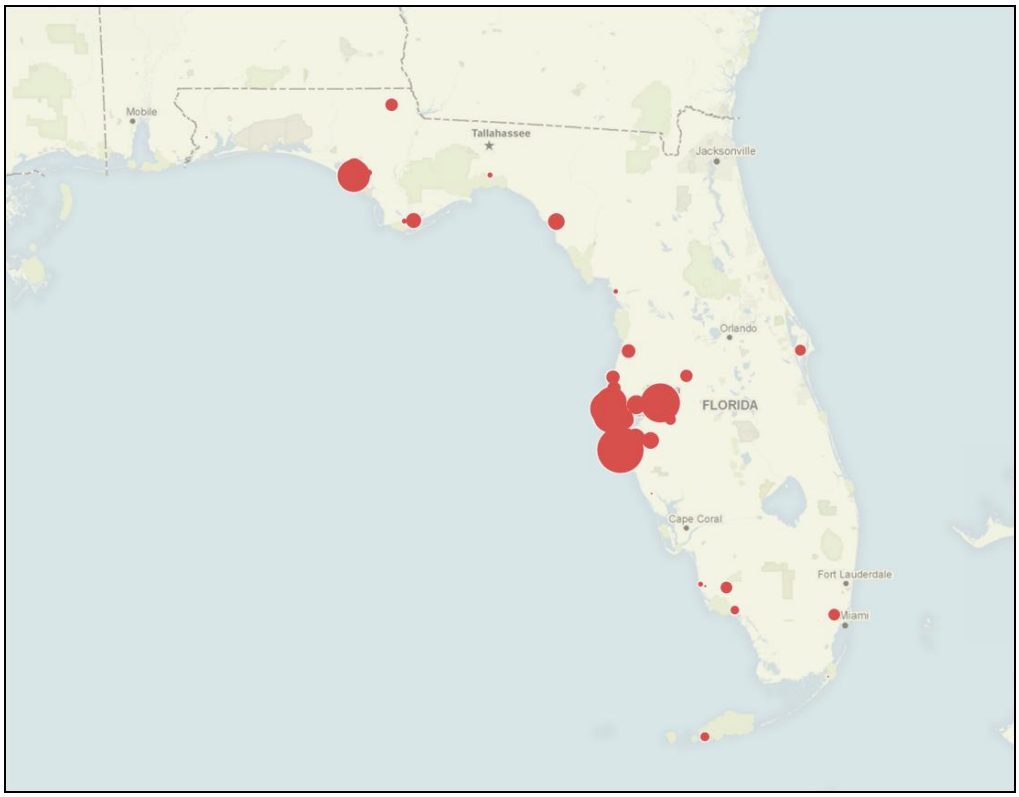

Figure 3.4.2. Longline shallow water grouper 2007 landings by zip code of vessel permit owner (Source: SEFSC Logbook Data).

Pinellas County

Pinellas County has seen steady growth since 1990 through 2007 as its population has grown to 922,147 as seen in Table 3.4.1. 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% Hispanic and 16.0% African American.

The overall non-white population was estimated to be 29.1% in 2007. 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).

Table 3.4.1. 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
Percent under 5 years of age	5.2	4.3	5.0
Percent 65 years and older	26.0	15.0	20.8
Ethnicity or Race (Percent/one or more races)			
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
Non-Hispanic (White alone)	-	82.8	80.9
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 below poverty line)	9.5	10	11.6
Owner Occupied Housing (Percent)	69.2	70.8	71.2
Value Owner-occupied Housing (Median $)	73,800	96,500	190,800
Percent of Civilian Labor Force Unemployed (16 yrs and over)	4.5	4.3	5.0
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 and Class of Worker (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
Self-employed workers	7.3	6.4	6.4

* Data from NOAA Spatial Patterns of Socioeconomic Data 1970 to 2000 and the 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).

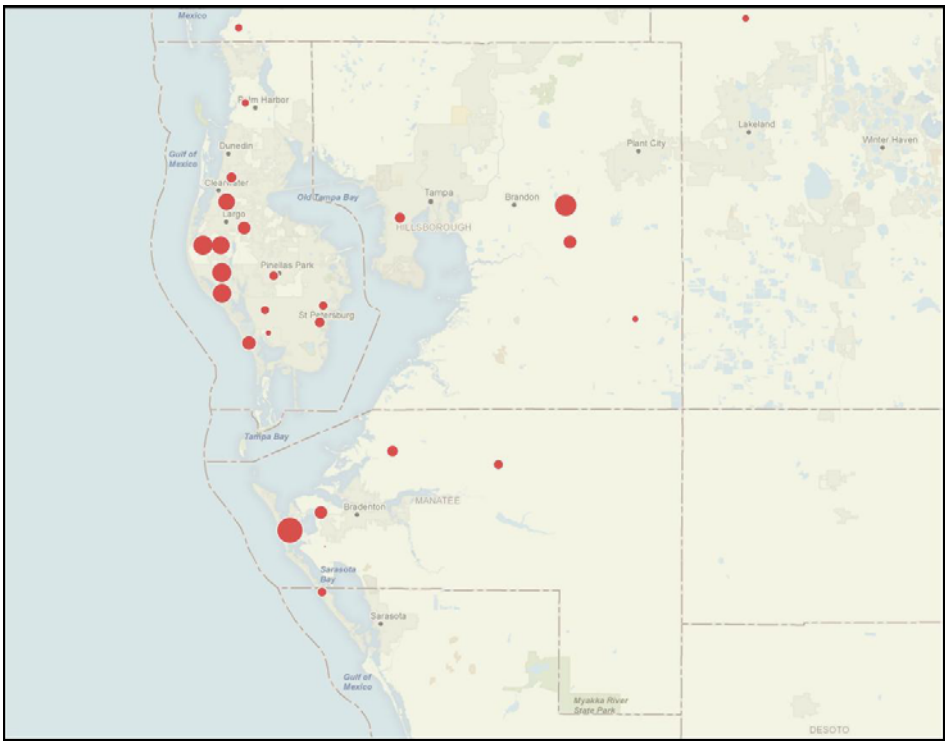

Figure 3.4.3. Longline shallow water grouper 2007 landings by zip code of vessel permit owner for Hillsborough, Pinellas and Manatee Counties (Source: SEFSC Logbook Data).

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 there (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, industry representative, 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 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).

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 contribute substantially to the total landings in Madeira Beach are gag and yellowedge grouper (Figure 3.4.4). 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 3.4.4 suggests fish dealers in this community rely considerably upon several species harvested with that gear type.

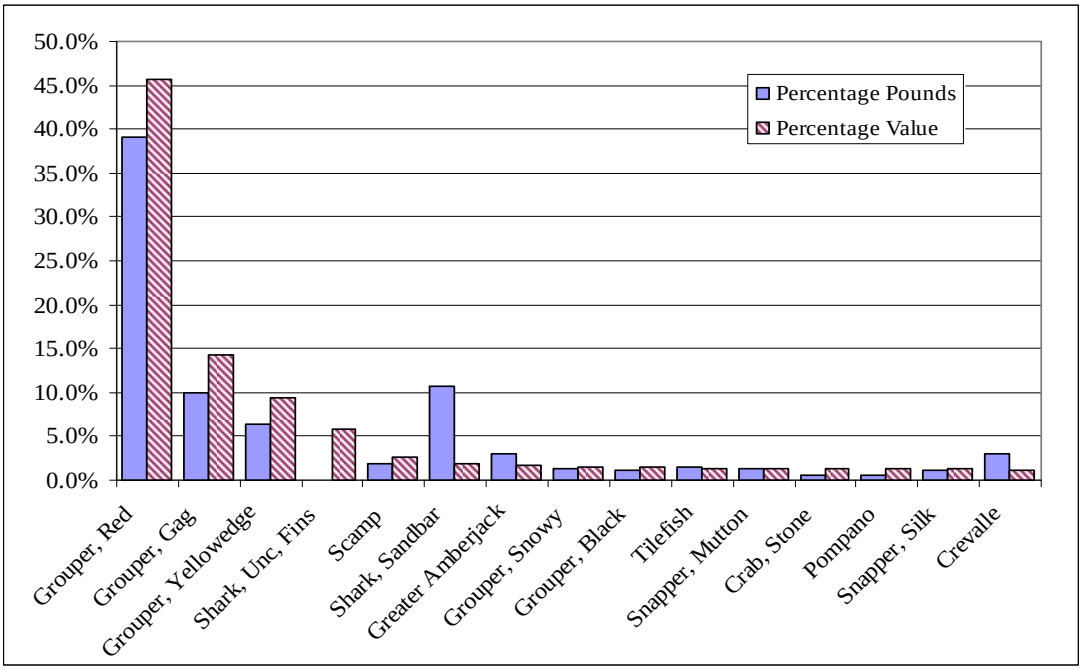

Figure 3.4.4. Percentage of pounds and value for top fifteen species landed from total landings in Madeira Beach 1999-2007 (Source: ALS SEFSC 2009). Shark fins are not measured by the pound and therefore have only a bar representing value.

Since the emergency rule to prohibit longline gear inside of 50 fathoms off Florida's west central 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.” Whether captains are having difficulty adapting to this different gear type and/or the species they target are easier to catch with longline gear is undetermined. In either case, 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 sometimes left with these expenses unpaid as captains have been let go, while others have quit. Overall landings for one fish house have dropped from 100,000 lbs to 5,000 lbs 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 during the closure. Those who have not converted are choosing to fish elsewhere or have tied vessels to the dock and are not fishing at all. Some vessels were fishing outside of 50 fathoms until the DWG quota was filled.

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 alternatives. 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 3.4.5). 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.

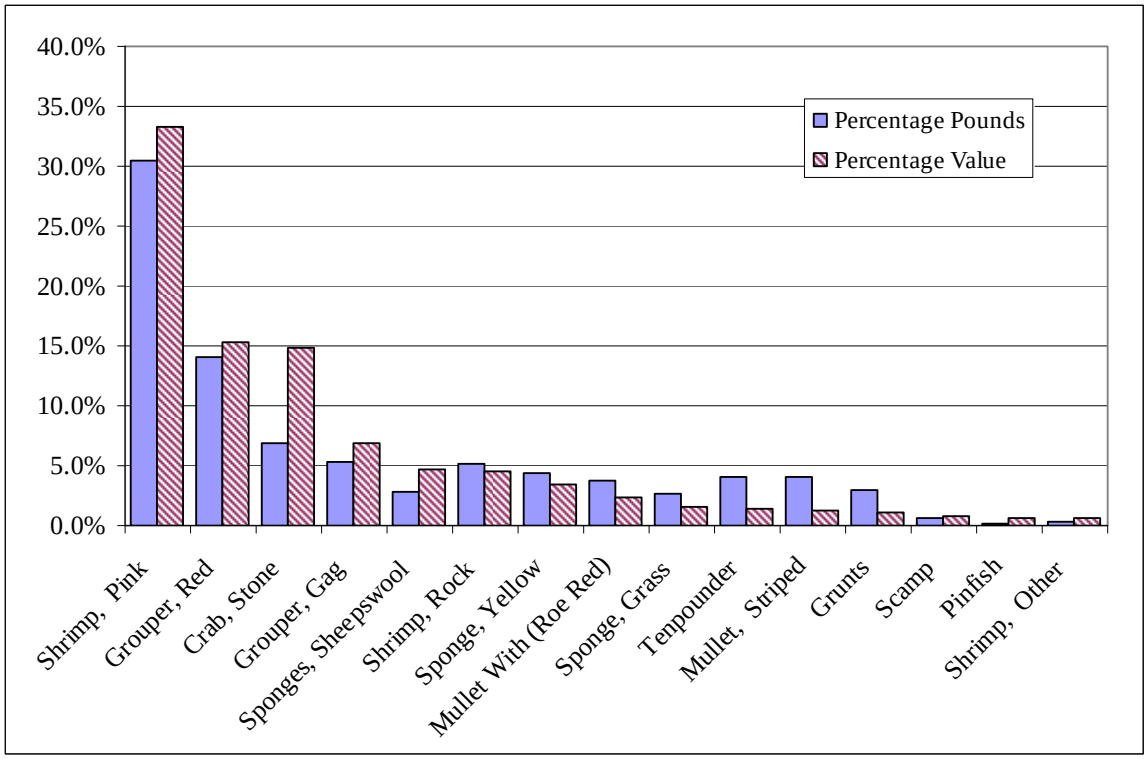

Figure 3.4.5. Percentage of pounds and value for top fifteen species landed from total landings in Tarpon Springs 1999-2007 (Source: ALS SEFSC 2009).

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.

Other communities in the county, such as St. Petersburg, also have substantial landings of shallow water grouper species, however, these communities do not show the concentration of fishing infrastructure that is evident in the aforementioned communities. Some communities, such as Indian Shores and Redington Shores, that have substantial landings do not appear as profiled fishing communities but are relatively close to other barrier island fishing communities just west of St. Petersburg. These communities may represent business entities that do not require the concentrated fishing infrastructure like an individual who acts as his own dealer or a restaurant that buys directly from a vessel.

All 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 the seasonal residence of 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 3.4.2. 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	6.0	1.1	1.8
Hispanic or Latino (any race)	4.5	9.3	12.5
Non-Hispanic (White alone)	-	80.3	76.3
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
Percent of Population Below Poverty Line	10.2	10.1	10.9
Owner Occupied Housing (Percent)	70.9	73.8	73.5
Value Owner-occupied Housing (Median $)	79,400	119,400	231,000
Percent of Civilian Labor Force Unemployed (16 yrs and over)	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	28.0
Farming, fishing, and forestry occupations	4.1	1.4	1.0
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
Self-employed workers	7.3	7.0	5.9

* 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 (Table 3.4.2) 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 total non-white population has grown to 23.7% over the past years. 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 with slightly over 73.5% compared to 70.3% for the entire state (U.S. Census Bureau).

Manatee County Communities

The community of Cortez is listed as a fishing community in Manatee County and classified as primarily involved in fishing (Impact Assessment, Inc. 2005). 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 following the state's implementation of the net ban. 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 and specializes in bait fish. 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. There are other dealers located within the community, one is a retail store, another bait shop and a few individuals who hold dealer licenses. 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 to accommodate increased tourism on the barrier islands. There has been a celebrated resistance to a variety of development conflicts within the village over many years which has 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 1990's, land was purchased by a non-profit (F.I.S.H., Inc.) 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).

The community of Cortez had significant landings of baitfish, as just over 30% of all pounds landed during 1999-2007 were baitfish (Figure 3.4.6). However, in terms of value, red grouper is by far the most important species with over 30% of value from all species landed is attributed to that species which far outgains other species landed in the community in terms of value. 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.

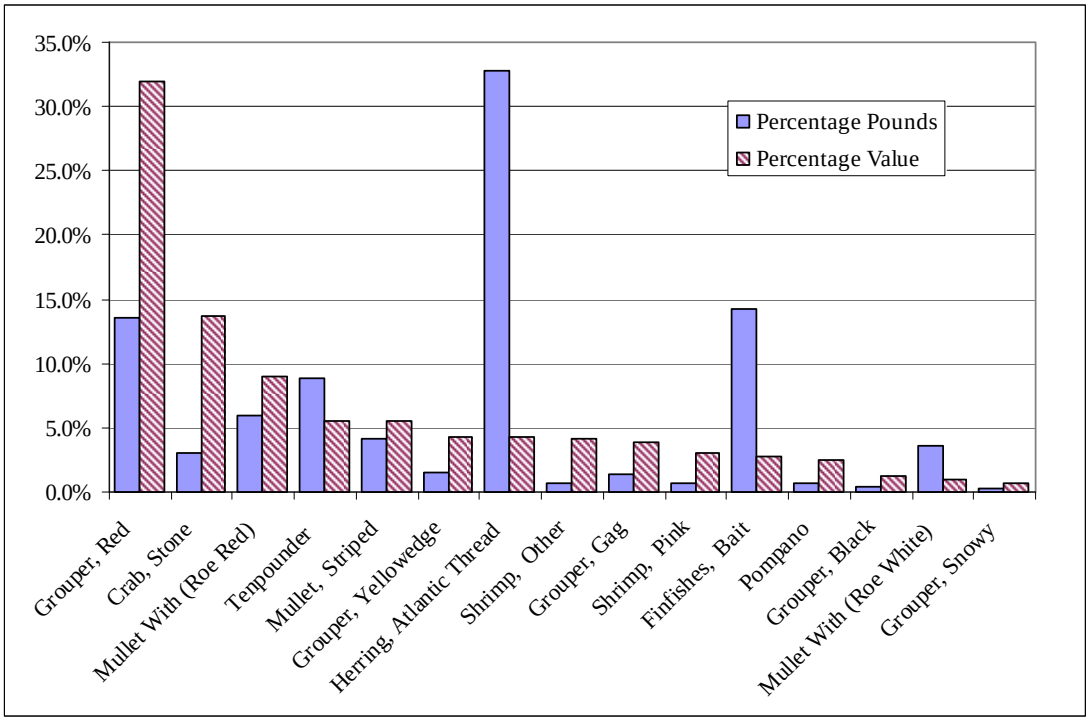

Figure 3.4.6. Percentage of pounds and value for top fifteen species landed from total landings in Cortez, Florida 1999-2007 (Source: ALS SEFSC 2009).

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, industry representatives, 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. It seems the learning curve for vertical line fishing may be a steep one. 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 for 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 3.4.7).

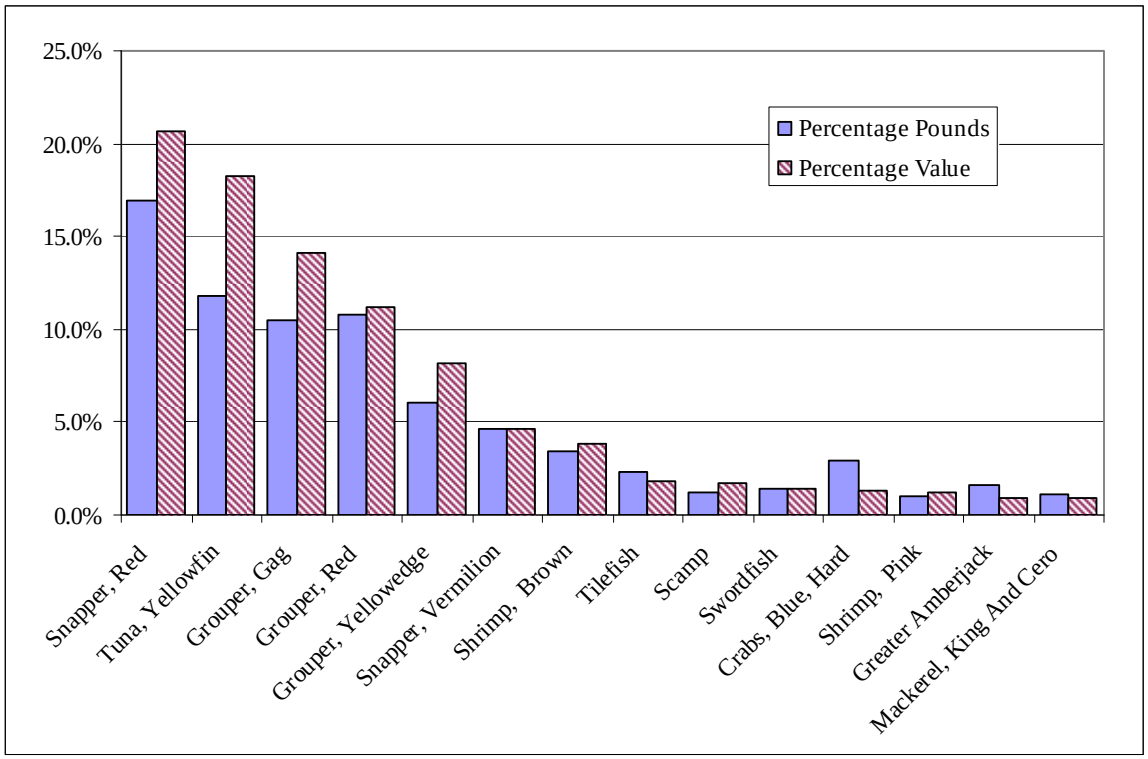

Figure 3.4.7. Percentage of pounds and value for top fifteen species landed out of total landings in Panama City, Florida 1999-2007 (Source: ALS SEFSC 2009).

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 3.4.8. 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.

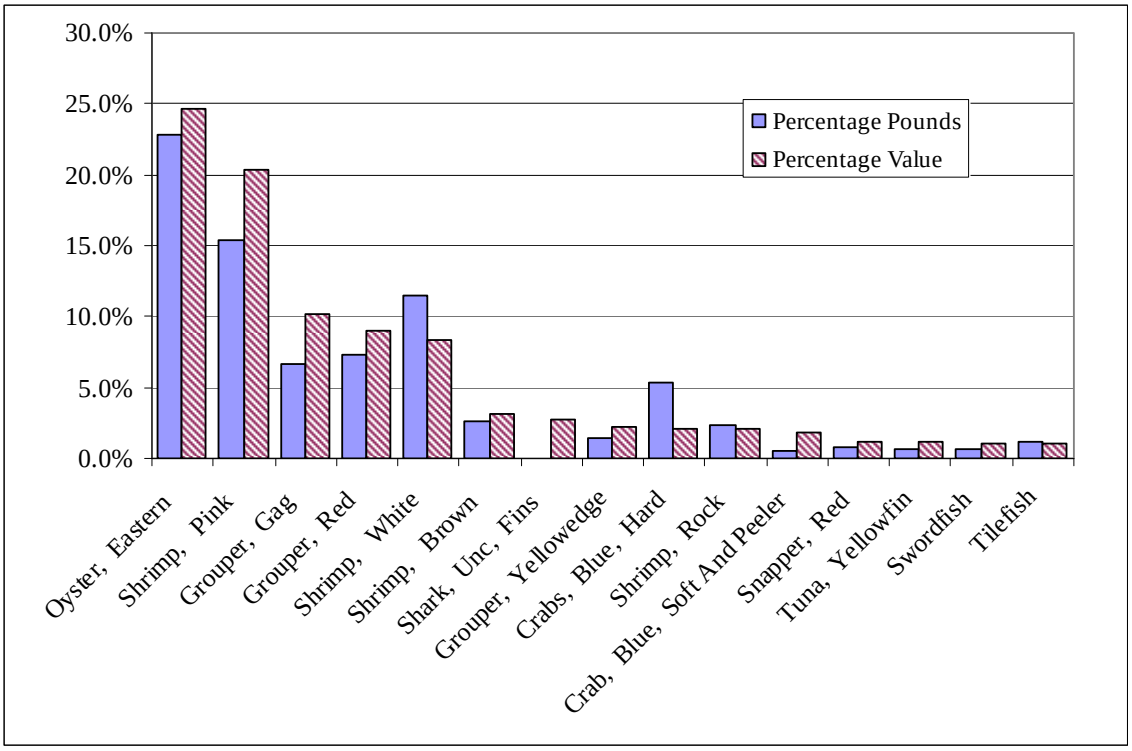

Figure 3.4.8. Percentage of pounds and value for top fifteen species landed out of total landings in Apalachicola, Florida 1999-2007 (Source: ALS SEFSC 2009).

The community of **Steinhatchee** is smaller than both Panama City and Apalachicola, but does have fishing infrastructure devoted to the commercial sector of the reef fish fishery. 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 dominated in terms of value and blue crab was the largest in terms of pounds landed (Figure 3.4.9). Red grouper shares second in terms of value of landings with blue crab representing just over 11% of total value for both. Gag grouper ranked fourth in terms of value and was seventh in percentage of pounds landed.

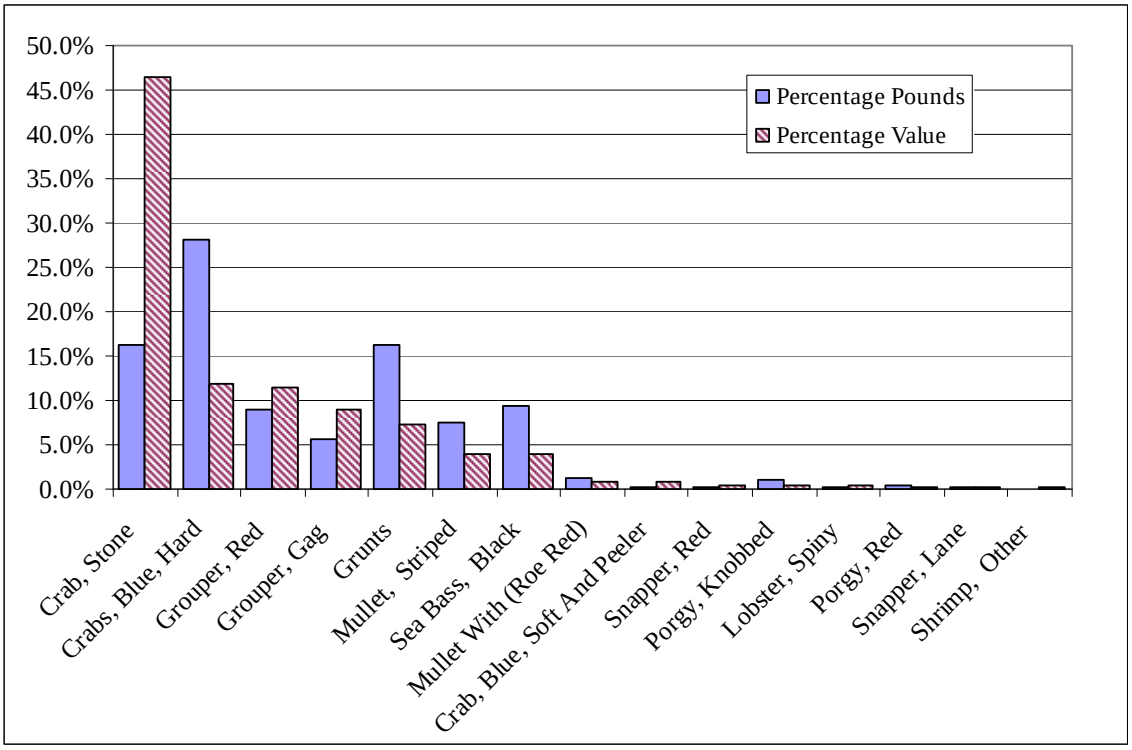

Figure 3.4.9. Percentage of pounds and value for top fifteen species landed out of total landings in Steinhatchee, Florida 1999-2007 (Source: ALS SEFSC 2009).

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 3.4.10 pink shrimp dominate the landings and value among all species harvested for the community from 1999 to 2007. 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.

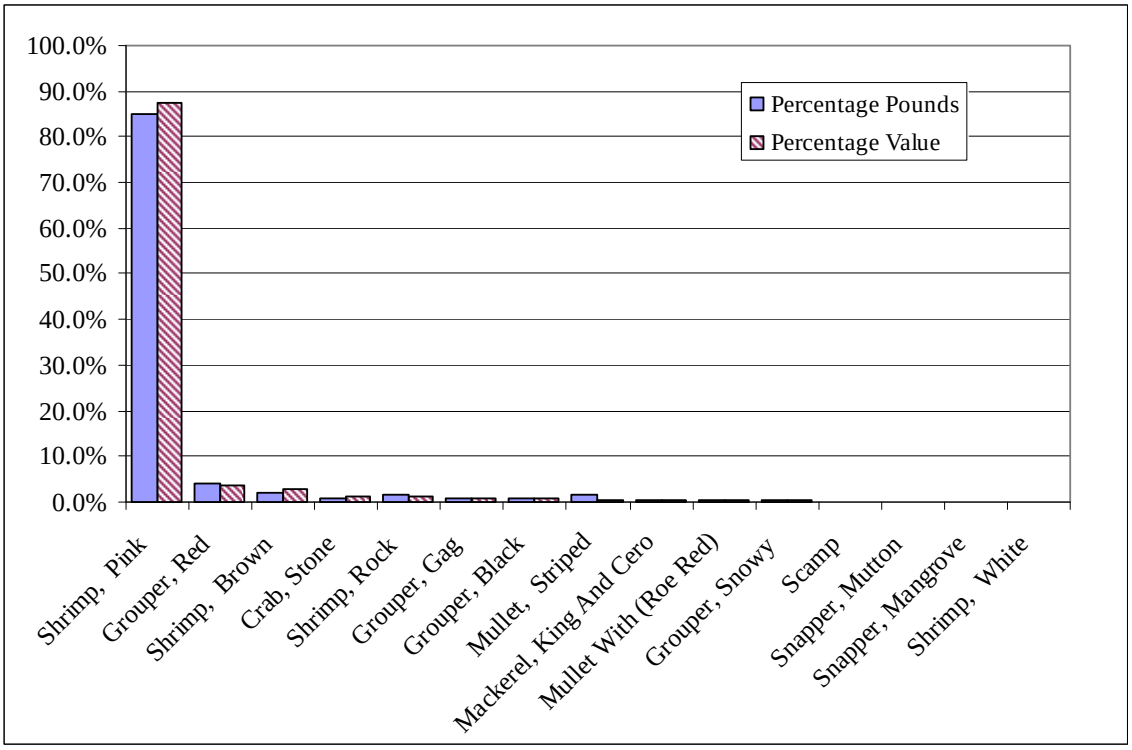

Figure 3.4.10 Percentage of pounds and value for top fifteen species landed out of total landings in Fort Myers Beach, Florida 1999-2007 (Source: ALS SEFSC 2009).

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 the downtown area and primary tourism destination.

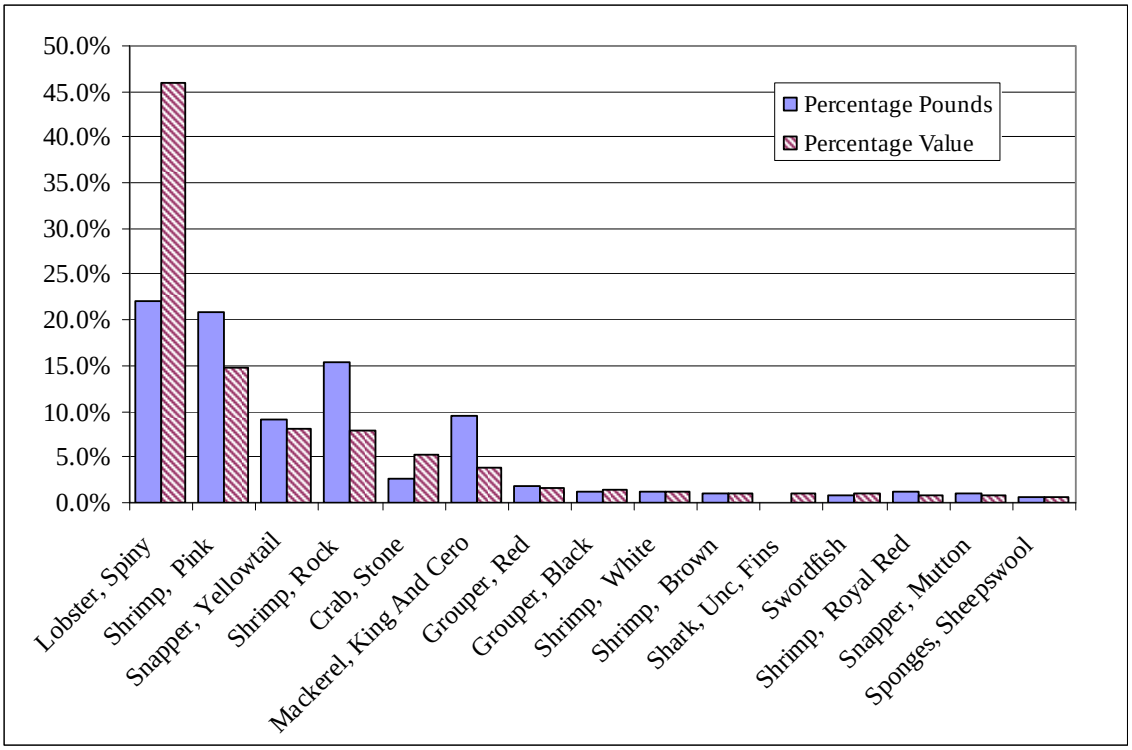

Figure 3.4.11. Percentage of pounds and value for top fifteen species landed out of total landings in Key West, Florida 1999-2007 (Source: ALS SEFSC 2009).

In terms of landings and value for 1999-2007, spiny lobster is the most valuable and highest in pounds landed. Pink shrimp is next with yellowtail snapper close behind (Figure 3.4.11). 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.

3.5 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 bottom longline component of the reef fish 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 state's estimated minority (interpreted as non-white, including Hispanic) population was 38.7%, while 12.6% of the state's 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 rulemaking. 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 rulemaking 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 rulemaking. 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 rulemaking are expected to be positive. This proposed rulemaking 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 sector of the 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.

3.6 Administrative Environment

Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the Exclusive Economic Zone (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 Magnuson-Stevens Act and with other applicable laws summarized in Section 6. 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 United States Coast Guard (USCG), and various 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 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 2004a).

4.0 ENVIRONMENTAL CONSEQUENCES

This section provides the scientific and analytical basis for comparing the alternatives described in Section 2.0. The direct, indirect, and cumulative effects on the physical, biological, social, economic, and administrative environments for each management alternative are described below. This section also describes: 1) Any unavoidable adverse effects resulting from the proposed action, 2) the relationship between short-term uses of man's environment and long-term productivity, and 3) any irreversible or irretrievable commitments of resources resulting from implementation of the proposed action.

CEQ regulations (40 CFR 1508.8) define direct effects as those "which are caused by the action and occur at the same time and place." Indirect effects are defined as those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Cumulative effects are defined as "impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions."

This proposed rulemaking would be effective until superseded by the implementation of Amendment 31 or other long-term sea turtle mitigation measures. Because of the intended short duration of this action, all effects on the environment are expected to be temporary. The following describes direct and indirect effects on the environment during the time period, November 2009-April 2010, this rulemaking is expected to be effective. The effects would be expected to discontinue if the rule was terminated at an earlier date.

Actual implementation of the depth restriction would be through a series of point-to-point lines following the approximate isobath, similar to the existing seaward coordinates of the longline and buoy gear restricted area (Figure 2.1). For **Alternatives 2 and 3**, the new line would apply only to bottom longline gear. Buoy gear has not been in use in recent years. 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.

Rules for stowage of the longline gear while possessing reef fish in the closed area would be required to allow transit across closed the area. 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)].

Rules for the hook limitation would be based on the possession of a valid reef fish permit. Therefore, any vessel with a shark permit and a reef fish permit would be subject to the hook restriction even if the trip targets sharks and all their reef fish are released.

4.1 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 sector of the 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 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 targeting SWG in the 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 50 fathoms or deeper.

Alternative 1 would return the impacts on the physical environment to the levels existing prior to the implementation of the emergency rule in May 2009. 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.

Preferred Alternative 2 and **Alternative 3** would further 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. Moving the bottom longline gear boundary to deeper depths 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. However, the impact on the physical environment from bottom longline gear would be decreased if a shift in effort from bottom longline to vertical line gear occurred in response to this rule and the proposed actions in Amendment 31 or other long-term mitigation measures. This would still create physical impacts, but these would likely be less than those incurred if no effort shift occurred. **Preferred Alternative 2** would also limit the number of hooks to 1000 hooks per vessel with 750 hooks rigged for fishing at any given time. The impact on the physical environment due to the limitation in hooks is unknown. The impact could decrease if the probability of the hooks snagging the benthic substrate is correlated with the number of hooks; however, if the number of sets increases as a result of the hook restriction then the impact could increase.

4.2 Direct and Indirect Effects on the Biological/Ecological Environment

Sea Turtles

Direct effects of the Gulf reef fish fishery on sea turtles occur when sea turtles interact with fishing gear and result in 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 SEFSC RFOP recorded sea turtle takes from bottom longline component of the reef fish fishery during 2006-2007 (Figure 4.2.1; NMFS-SEFSC 2008). Additionally, the observer data (NMFS-SEFSC 2009) show most of the sea turtle takes occurred on fishing trips west of the Tampa Bay area (Figure 4.2.1).

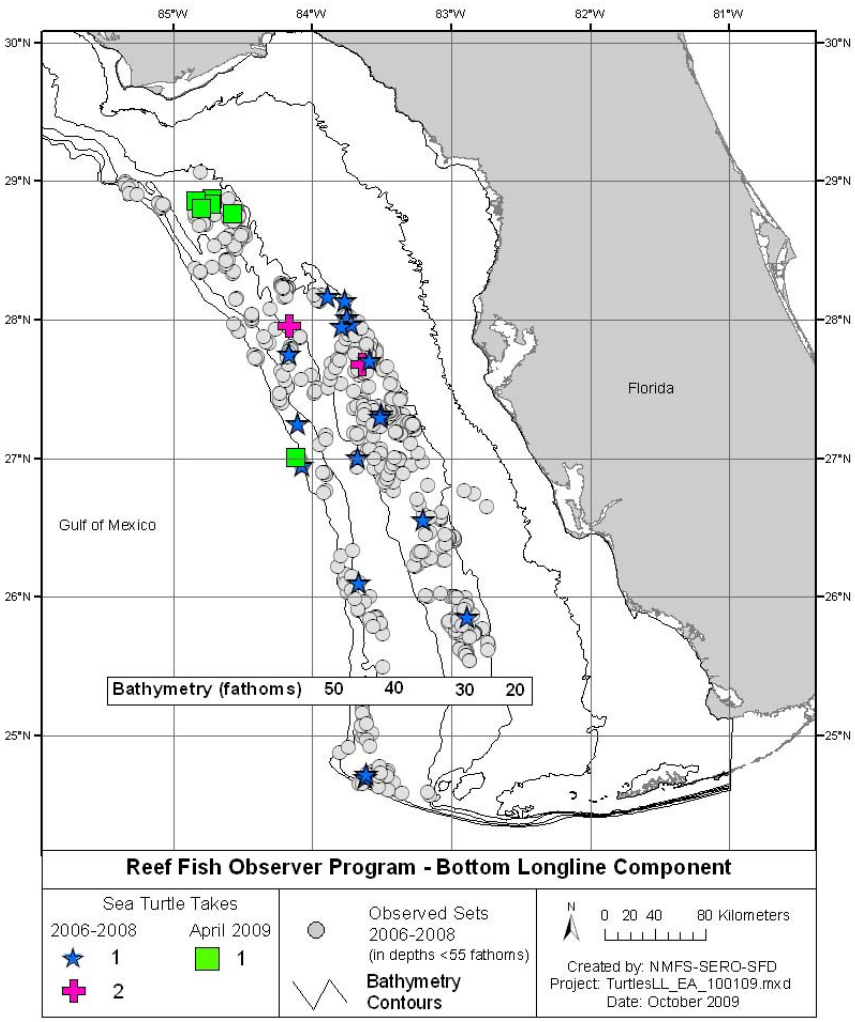

Figure 4.2.1. Map of the eastern Gulf showing locations of longline sets in water depths less than 55 fathoms with observers onboard during 2006-2008 (NMFS-SEFSC 2009).

The distribution of sea turtles in the eastern Gulf has been documented in several studies. A satellite telemetry study (Figure 4.2.2) conducted from 1998-2002 tagged 24 female loggerhead sea turtles (Schroeder et al. manuscript in prep). 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). 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; see Appendix B). 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 C).

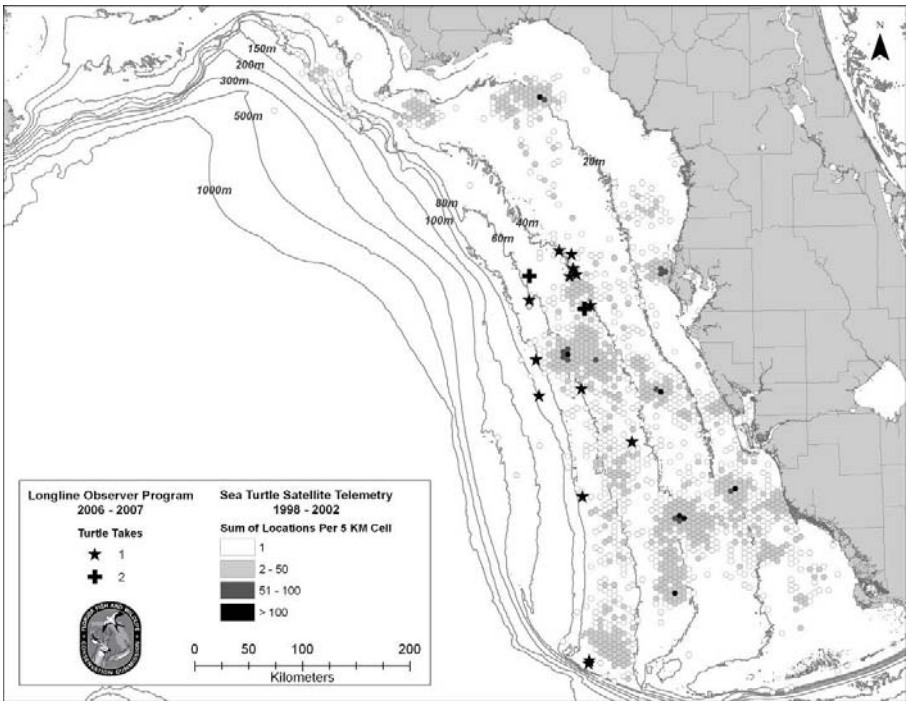

Figure 4.2.2. Spatial frequency distribution of sea turtle satellite telemetry data from 1998-2002 (Schroeder et al., manuscript in prep) and SEFSC sea turtle take data from bottom longline observer data during 2006-2007 (NMFS-SEFSC 2008). The depth contours are presented in meters (conversion: 1 meter = 0.5468 fathom). Using this conversion, 50 fathoms is approximately 91 meters in depth.

An aerial survey (NMFS 2009b) observed sea turtles during the summer and winter of 2007. Loggerhead sea turtle encounter rates were generally higher in the summer (Figure 4.2.4) than the winter in water depths between 20 fathoms and 60 fathoms (Figure 4.2.3). However, these results may not accurately reflect sea turtle densities because, 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, and in turn, the extent of the homogeneous or heterogeneous spatial distribution of the sea turtle

population in the Gulf. 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 Fisheries Statistics Survey and aerial survey, respectively. Based on a qualitative comparison of these studies, the spatial temporal relationship between depth and season pertaining to the distribution of sea turtles in the Gulf indicates that sea turtles are encountered more frequently in the summer season in the 10-40 fathom depth range. 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 between sea turtle distribution and bottom longline fishing effort 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.

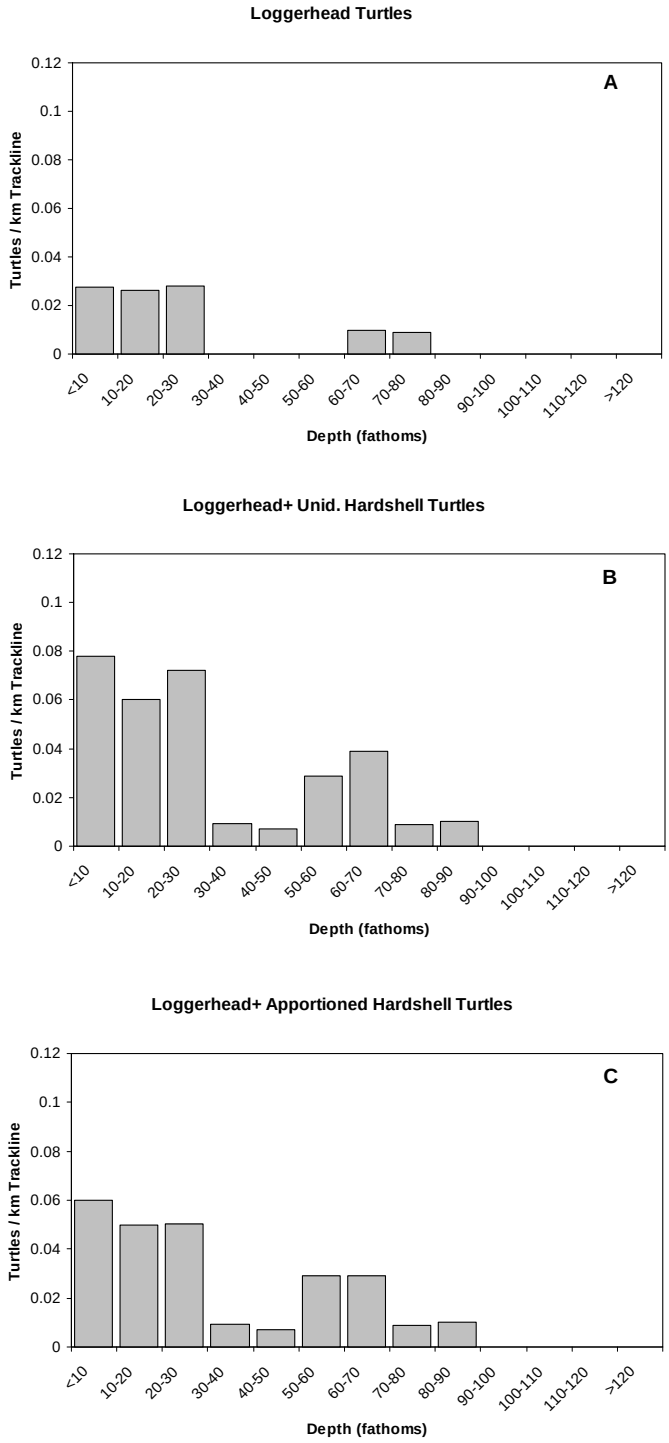

Figure 4.2.3. Loggerhead sea turtle encounter rate (number of sea turtles per km of aerial survey trackline) as a function of depth during the winter survey. Plots include (A) identified loggerhead sea turtles, (B) loggerhead sea turtles plus all unidentified hardshell sea turtles, and (C) loggerhead sea turtles with apportioned hardshell sea turtles based on neighborhood averaging (NMFS 2009b).

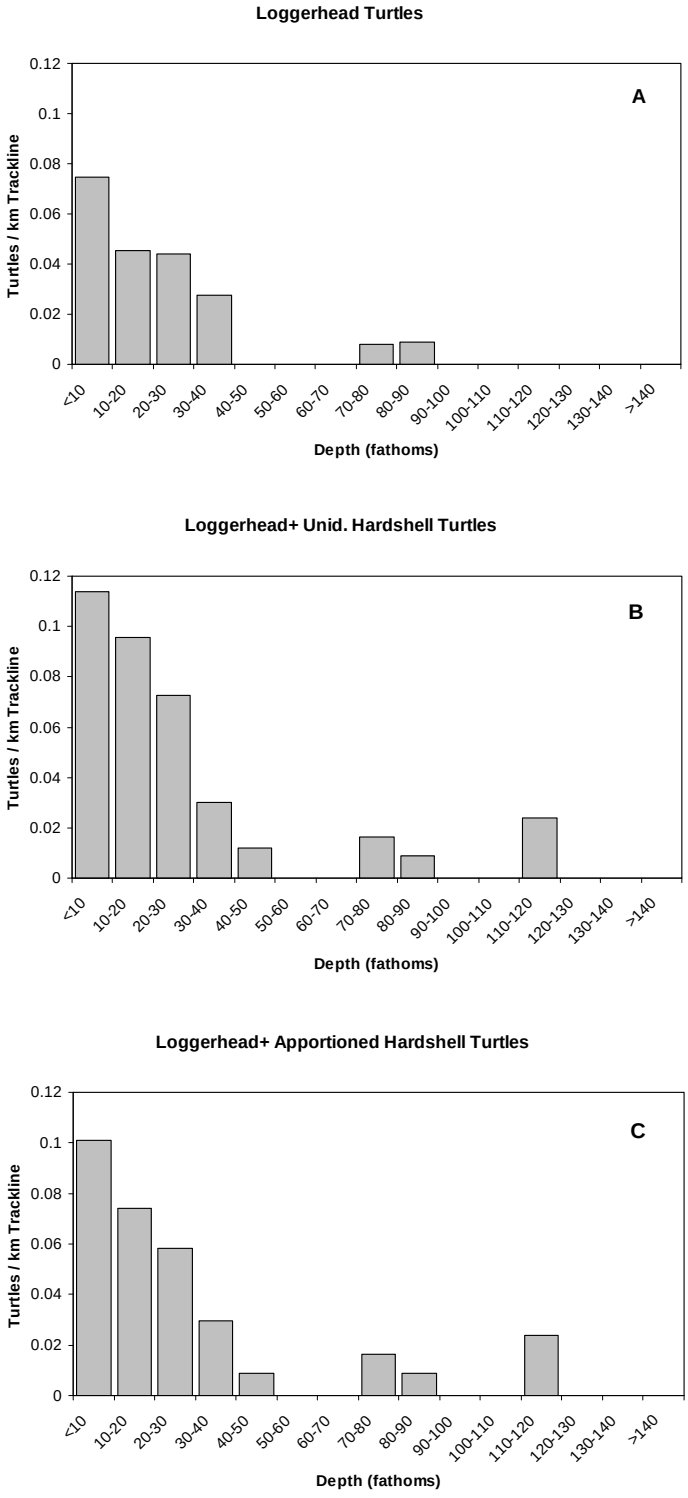

Figure 4.2.4. Loggerhead sea turtle encounter rate (number of sea turtles per km of aerial survey trackline) as a function of depth during the summer survey. Plots include (A) identified loggerhead sea turtles, (B) loggerhead sea turtles plus all unidentified hardshell sea turtles, and (C) loggerhead sea turtles with apportioned hardshell sea turtles based on neighborhood averaging (NMFS 2009b).

The biological impacts of **Alternatives 1-3** on sea turtles would depend on the reduction in the level of fishing effort in the commercial sector of the reef fish fishery. Prior to the implementation of an emergency rule in May 2009, bottom longline gear could only be used in waters greater than 20 fathoms (36.6m) in the eastern Gulf (east of 85°30' W longitude). **Alternative 1,** no action, would return the fishing effort to the levels prior to the implementation of the emergency rule. This alternative would almost certainly cause the fishery to exceed the ITS authorized in the 2009 BiOp, and is not believed to be in compliance with the mandates of the ESA or the MSA. Other actions would need to be developed to address sea turtle takes and provide adequate protection for threatened sea turtle species.

Given the geographic distribution of loggerhead sea turtles described above, shifting reef fish bottom longline fishing effort to deeper waters is expected to reduce loggerhead sea turtle takes. All but one sea turtle take (95% of sea turtle takes) during observer studies (NMFS-SEFSC 2009) were on sets in water depths of 50 fathoms or less, and 76% of sea turtles takes were on sets at 35 fathoms or less (Figure 4.2.1). **Preferred Alternative 2** and **Alternative 3** would restrict the use of bottom longline gear based on water depths. 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. A closure based on the 35-fathom contour (**Preferred Alternative 2**) is expected to shift the effort that occurred from 20-35 fathoms to between 35 and 50 fathoms, where sea turtle captures are expected to be less frequent (NMFS 2009f). If bottom longline fishermen convert to vertical line gear, it is likely that sea turtle interactions with vertical line would increase although the individual impacts to sea turtles would be expected to be less severe because the sea turtle bycatch mortality rate of vertical line gear is estimated to be much lower than that of bottom longline gear.

Preferred Alternative 2 also limits the number of hooks to 1,000 per vessel of which 750 can be fishing or rigged for fishing at any given time. 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 and average of 1,500 hooks per set (NMFS 2009a). 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 the gear and remove the catch and bycatch. Reduced 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 catch. Limiting the number of hooks could allow operations to run more efficiently such as retrieval of the mainline, and removing the catch and bycatch. Observers recorded the greatest number of hardshell sea turtle takes when 1,500 and 2,100 hooks per set were used. This information suggests that a lower number of hooks per set may reduce hardshell sea turtle interactions with bottom longline gear. It is possible some bottom longline fishermen could simply increase the number of sets

thereby offsetting some of the reduction in hardshell sea turtle interactions that may have been achieved otherwise. To incorporate potential effort compensation associated with the hook limit, analyses estimating the effects this action may have on sea turtle bycatch assumed the number of sets for bottom longline vessels currently using more than 1,000 hooks was increased to match the average number of sets made by bottom longline vessels that currently use between 650-850 hooks (note: no adjustment was made if the vessel was currently making more sets than the average level). Based on this assumption, this requirement is still expected to reduce sea turtle bycatch levels. An effort shift in the commercial sector of the reef fish fishery is not as likely to occur with the implementation of hook restrictions.

Reducing fishing effort is expected to decrease the probability of sea turtle interactions by assuming a 1:1 ratio. An analysis of the overall effect of each alternative on the fishing effort suggested **Alternative 1** as the least restrictive for effort and **Alternative 3** as the most restrictive (Figure 4.2.5). **Alternative 1** would not reduce fishing effort and in turn would not decrease sea turtle mortality rates relative to the 2007-2008 effective effort baseline during the expected period of implementation (November 2009 through April 2010). **Preferred Alternative 2** and **Alternative 3** are estimated to reduce effort by 40% and 59%, respectively, during that period relative to the status quo.

The combined effects of the 2009 emergency rule and **Alternative 1** are an estimated 41% reduction in effort during the expected effective dates (May 2009 through April 2010) relative to the 2007-2008 effective effort baseline. The combined effects of **Preferred Alternative 2** and **Alternative 3** with the emergency rule are an estimated 60% and 69% reduction in effort during those expected effective dates relative to the status quo.

Considering the effects of the emergency rule in 2009 and the possible implementation of Amendment 31 in 2010, the overall reduction in fishing effort under **Alternative 1** is estimated as 41% (2009) and 43% (2010) relative to the 2007-2008 effective effort baseline (NMFS 2009e). The effort reduction accomplished under the combined effects of the emergency rule, **Preferred Alternative 2** and Amendment 31 is estimated at 47% (2009) and 56% (2010). The emergency rule, **Alternative 3** and Amendment 31 are estimated to reduce effort by 55% (2009) and 58% (2010).(NMFS 2009e). The increase in effective effort in January 2010, as shown in (Figure 4.2.5) is due to the directed effort for DWG which would occur when the 2010 fishing year begins.

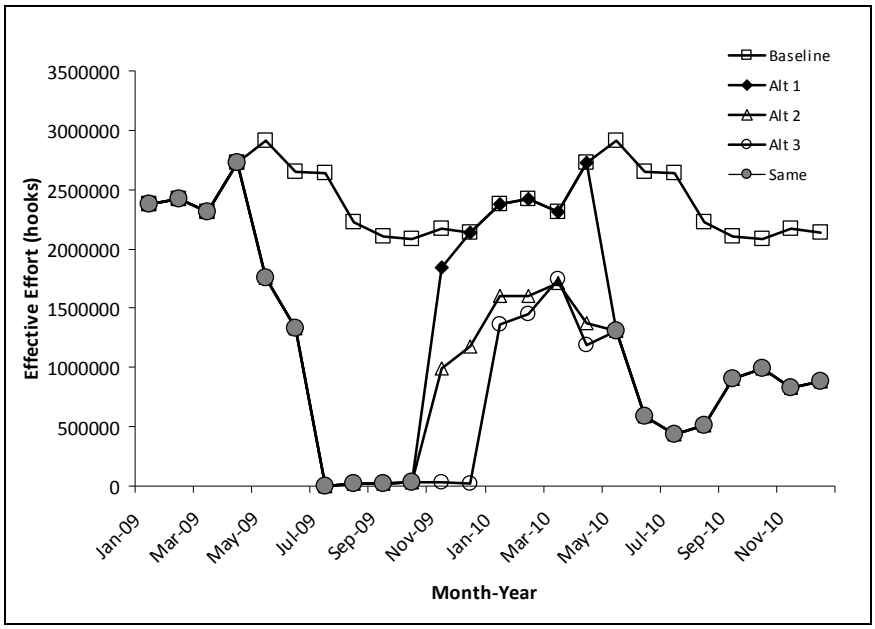

Figure 4.2.5 Comparison of baseline bottom longline effort to the effective effort based on the 2007-2008 logbook data (NMFS 2009e). This analysis assumes that Amendment 31 measures would be implemented by May 2010.

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 portion of the reef fish fishery targeting grouper and tilefish.

The biological impacts of **Alternative 1** would be the same as was realized before the emergency rule. Longline landings of all grouper and tilefish species for 2005-2007 averaged approximately 5 mp (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). **Alternative 1** would not reduce fishing effort relative to the 2007-2008 effective effort baseline during the expected period of implementation (November 2009 through April 2010). The combined effects of the 2009 emergency rule and **Alternative 1** are an estimated 41% reduction in effort during the expected effective dates (May 2009 through April 2010) relative to the 2007-2008 effective effort baseline. Considering the effects of the emergency rule in 2009 and the possible implementation of Amendment 31 in 2010, the overall reduction in fishing effort under **Alternative 1** is estimated as 41% in 2009 and 43% in 2010 (Figure 4.2.6).

Restricting the use of bottom longline gear (**Alternatives 2 and 3**) would reduce effort in the reef fish fishery by 40% and 59%, respectively, during the expected period of implementation relative to the status quo. The combined effects of **Preferred Alternative 2** and **Alternative 3** with the emergency rule are an estimated 60% and 69% reduction in effort during the expected effective dates relative to the status quo. The effort reduction accomplished under the combined effects of the emergency rule, **Preferred Alternative 2** and Amendment 31 is estimated at 47% (2009) and 56% (2010). The emergency rule, **Alternative 3** and Amendment 31 are estimated to reduce fishing effort by 55% (2009) and 58% (2010).(NMFS 2009e).

Reduced effort would decrease 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 bottom longline effort could reduce both directed fishing mortality and release mortality for red grouper even if vertical line fishing increased.

Many fishermen currently using longline have converted or are expected to convert to vertical line gear if restrictions on bottom longlining are implemented. The amount of potential effort shift to vertical line gear cannot be estimated at this time. For most species, CPUE (landings per day) 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.

Table 4.2.3 shows the expected changes in total SWG landings given various levels of shift in effort with prohibition of longline gear in 35 and 50 fathoms. These reductions were calculated as follows:

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

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 4.2.3 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)					
35	-32.4	-29.3	-26.2	-23.2	-20.1
50	-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 4.2.4). 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. 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 keep catch within the quota and prevent closures.

Table 4.2.4 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					

35	-38.8	-35.8	-32.8	-29.8	-26.8
50	-48.3	-44.5	-40.7	-36.9	-33.1
Gag					
35	-13.2	-8.8	-4.4	-0.1	+4.3
50	-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 4.2.5). Potential increases with effort shift for species undergoing overfishing were calculated as follows:

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

where $\bar{L}$ is mean annual landings (total weight in pounds GW) in the eastern Gulf from 2006–2007, 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 2006-2007.

Table 4.2.5. 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					
35	0.0	+ 6.3	+ 12.6	+ 18.9	+ 25.2
50	+3.2	+16.4	+29.6	+42.8	+56.0
Gray Triggerfish					
35	+0.5	+3.0	+5.5	+7.9	+10.3
50	+0.3	+4.8	+9.3	+13.8	+18.3

Some fishermen may switch to buoy gear. 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). 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.

If bottom longline fishermen do not change gear, they may shift effort to DWG and tilefish. These species are typically caught in waters deeper than 50 fathoms. Amendment 29 to the Reef Fish FMP creates an IFQ program for grouper and tilefish species in the Gulf. NMFS intends to implement this program in January 2010. Under this program, closures will not occur, and fishermen can fish for whichever species they choose at any time throughout the year, if they have IFQ allocation for that species.

Amendment 31, if approved, would implement a closure of waters less than 35 fathoms during June – August. Fishermen anticipating reopening of bottom longline gear in shallow water in September may alter behavior and target DWG while the proposed rule is in place, assuming they could then target SWG later in the year.

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 classified as 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 2008 (first year of quotas) only 47% of the greater amberjack quota and 61% of the gray triggerfish quota were landed. Further, 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.

Preferred Alternative 2 would prohibit longline fishing in waters less than 35 fathoms; this would allow some longline fishing for SWG and would have little impact on fishing for DWG and tilefish. During 2005-2007, 65% of longline trips landing SWG were in waters less than 35 fathoms and 66% of SWG longline landings by weight were from waters less than 35 fathoms (Table 4.2.1).

Table 4.2.1 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).

	Depth (fathoms)				
	0-20	**20-35**	**35-50**	**50+**	**All depths**
Trips	82	646	239	160	1,127
Landings	178,200	1,789,600	730,800	280,800	2,979,500

Preferred Alternative 2 would also restrict each vessel to 1,000 hooks, of which 750 may be fished or rigged for fishing at any one time. Analysis suggests a baseline reduction in effective effort between 27-39% may be expected from limiting the reef fish bottom longline fishery to no greater than 750 hooks per set. 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). This reduction in effort could reduce the amount of targeted and non-targeted reef fish landed, resulting in a positive impact on reef fish stocks. Conversely, implementation of a restriction on the number of hooks could have a negative impact to the biological and ecological environment if fishing effort increased to offset gear limitations. For example, if CPUE is decreased due to fewer hooks, then fishers might fish more sets to make up for reduced catch. However, more sets per vessel may be difficult to complete simply due to time limitations for setting and retrieving gear. An effort shift from bottom longlines to vertical lines is not likely to occur due strictly to hook restrictions. If effort did shift to vertical line gear, then less biological or ecological damage to the environment may occur.

If the proposed rulemaking is effective Nov-April, **Preferred Alternative 2** is estimated to contribute to a cummulative reduction in effective bottom longline effort of 47% for 2009 and 56% for 2010 relative to 2007-2008 effective effort baseline (Figure 4.2.5).

Alternative 3 would prohibit bottom longline gear in waters less than 50 fathoms; this would essentially eliminate longline fishing for SWG but would have little impact on fishing for DWG and tilefish. During 2005-2007, 65% of longline trips landing SWG were in waters less than 35 fathoms (Table 4.2.1). Based on RFOP July 2006 through 2008, 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. Logbooks from the same time period show 91% by weight of SWG longline landings were from waters less than 50 fathoms (Table 4.2.1). Thus, prohibiting longline fishing in waters less than 50 fathoms would reduce effort substantially and thereby benefit reef fish stocks. If the emergency rule of **Alternative 3** is extended, Nov-April, **Alternative 3** is estimated to contribute to a cumulative reduction in effective bottom longline effort of 55% for 2009 and 58% for 2010 relative to 2007-2008 (Figure 4.2.5).

Alternatives 2 and 3 would restrict use of longline gear until Amendment 31 or other long-term mitigation measures are in place. If Amendment 31 is implemented, the 35-fathom depth restriction would begin in June, but longline fishing would be allowed outside the 20-fathom boundary during any months between implementation and June. For example, our analysis is based on this proposed rulemaking being in place for six months; in this case, longline fishing would be restricted to outside the 35-fathom line until the end of April. If Amendment 31 were implemented on May 1, longlining would be allowed outside the 20-fathom line until June 1. Then the Amendment 31 restriction to outside the 35-fathom line would be in place June 1-August 31. Amendment 31 could be implemented even earlier than May 1, allowing a longer time period before longline fishing would again be restricted to outside the 35-fathom boundary during the seasonal June-August closure as proposed in the amendment.

In 2005-2007, the number of SWG trips increased after May (Figure 4.2.6; NMFS 2009a). In recent years, many bottmom 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 sector reached its quota and 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, this pattern would not be expected to continue in 2010 regardless of which alternative is implemented due to the IFQ program. Under the IFQ program, fishermen are assigned shares of the quota and can fish whenever they wish without concerns about closures.

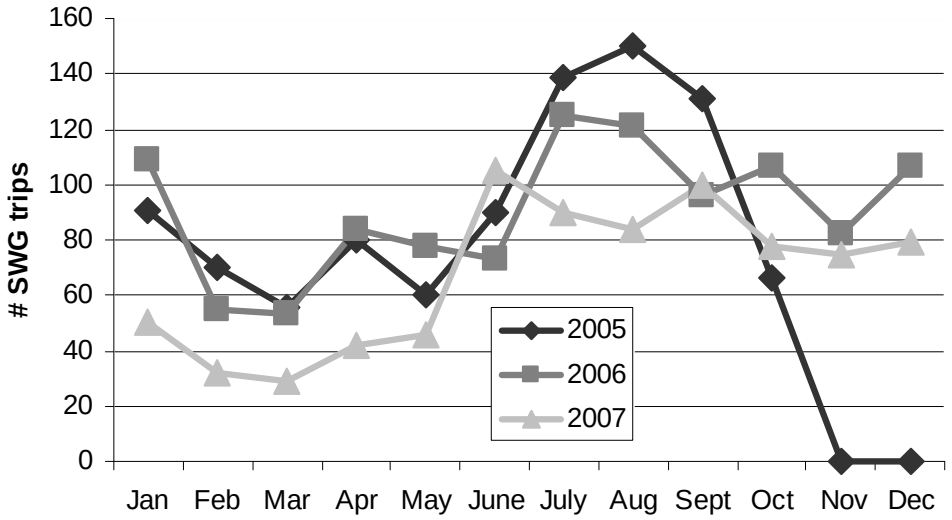

Figure 4.2.6. Number of trips landing SWG with bottom longline gear in the eastern Gulf by month (NMFS 2009a). Note: In 2005, the SWG quota was met and that sector closed in October.

4.3 Direct and Indirect Effects on the Economic Environment

Methodology

Because the bottom longline component of the Gulf reef fish fishery essentially targets grouper and tilefish, as discussed in Section 3.3.1, the following discussion emphasizes these components of the reef fish fishery. It should be noted, however, that the revenues associated with all species harvested by affected trips are included in this analysis.

A description of the methodology employed in this analysis is included in Appendix A, and is incorporated herein by reference. The following represents additional explanations and caveats to the analysis.

This analysis started with logbook records from 2005-2008 with recorded landings by bottom longline gear from statistical areas 1-8 that reported landing at least one pound of reef fish species. Because statistical area 8 extends west of Cape San Blas, Florida, the analysis may overestimate the expected effects of the proposed alternatives.

This analysis, however, did not incorporate all trips and vessels that used bottom longline gear and harvested reef fish. Some vessels are equipped with 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 a plurality of the revenues (largest share) was reported for reef fish 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 dominance of harvest using vertical line gear demonstrates a significant flexibility to rely upon vertical line gear instead of bottom longline gear and an increased ability to avoid the adverse economic effects of the proposed restrictions on the use of bottom longline gear.

Trips harvesting reef fish using bottom longlines but primarily operating in the shark fishery (revenues from shark species accounted for more than 50 % of the total harvest revenues for the trip) or which reported all their reef fish harvests from waters greater than either 35 fathoms or 50 fathoms, depending on the alternative analyzed, were assumed to proceed as normal. However, on the shark trips, revenues associated from reef fish from the respective shallow waters were tabulated as economic losses to these vessels. These selection criteria resulted in tallies of the number of vessels included in the analysis that do not equal totals reported elsewhere (see Section 4.2). An average of 116 vessels per year were identified in this analysis as having taken qualified bottom longline fishing trips during 2005-2008 for the historic fishery, while an average of 103 vessels and 111 vessels per year were identified as being affected by the 35-fathom and 50-fathom prohibitions, respectively.

Based on the characteristics of each relevant trip reported in the logbook records, trips were assumed to either continue to be taken 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 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). NOR was 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. NOR is 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 to vertical line gear. Conversion rates were modeled as varying from 0% to 100%. The performance of converted longline trips, in terms of trip length, operating costs, ex-vessel revenues, and NOR was assumed to equal that of historical vertical line trips. This assumption may overestimate the true harvest success of these converted trips because former longline vessels may not be as proficient at harvesting reef fish using vertical line gear as traditional vertical line vessels. As a result, this assumption may lead to an overestimation of the NOR "recovered" through gear conversion and an underestimation of the net change in economic effects. An alternative data-based assumption of more realistic harvest performance of converted vessels has not been identified.

Gear conversion costs were not included in the analysis. Gear conversion to a vertical line bandit reel set-up is estimated to cost approximately $13,750 per vessel (assumes four reels; Robert Spaeth, personal communication, 2009). The cost of gear conversion would not be considered a trip cost and, therefore, would not affect the estimated changes in NOR. The overall costs to the fleet of gear conversion are included in the effects discussion below.

As an alternative to gear conversion, some affected bottom longline vessels may elect to shift their effort to deeper waters. As a result, the alternative outcome scenarios more realistically consist of combinations of some vessels converting to vertical line gear, some retaining longline gear but fishing in deeper waters, and some ceasing fishing during the prohibition. This analysis did not model these three possibilities and, instead, only allowed vessels to convert their gear or cease fishing. The reasons for not modeling effort shift are discussed in Appendix-A. In summary, effort shift was not modeled because of data deficiencies, potential significant alteration of fishing behavior patterns, and possible congestion effects. The net effect of not allowing effort shift is an overestimation of the economic losses associated with the alternative restrictions because, absent the possibility of effort shift, all gear conversion scenarios result in non-converted trips being cancelled and the complete loss of all revenues associated with those trips. Effort shift instead of trip cancellation would reduce the amount of lost revenues.

In addition to directly affecting bottom longline vessels, the proposed alternatives could also affect the harvest success of the traditional vertical line fleet. Although 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 longline vessels at sites more suitable to vertical line activity could result in harvest rate declines for the vertical line fleet. 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 indeterminable, the effect of this assumption is also indeterminable.

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 is not expected to change and all reported effects accrue to the longline fleet. Thus, although the analysis allows gear conversion to vertical lines, all projected changes in NOR are borne by longline vessels.

Longline trips are, on average, longer in terms of the number of days fished than vertical line trips. The average 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 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 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 would translate into 10 converted vertical line trips using the average of 3.5 days per vertical line trip).

All results are based on average fishery behavior as recorded in the logbook data from 2005-2008. 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 portion of the reef fish fishery at the end of 2005 and the effects of red tide on subsequent catch rates.

Because the analysis is based on actual recorded trips that establish expectations of future behavior, these recorded trips encompass actual fishery conditions for the respective year. The timing of the closures of the harvest of DWG and tilefish is of particular note within these conditions. With the exception of 2005, while the harvest of SWG has been open year-round, the harvest of DWG and tilefish are subject to substantially lower quotas than SWG, which results in these quotas being met by mid-year. The harvest of tilefish closed on May 15 in 2009, while the DWG portion of the reef fish fishery closed on June 27 in 2009. Closure of these portions of the reef fish fishery results in effort shifts to SWG species and this behavior (for the 2005-2008 fishing seasons) is reflected in the data used for this analysis. Because the DWG and tilefish portion of the reef fish fishery close so much earlier in the year than the SWG, anticipation of regulatory change in 2009 may have induced effort shifts within the bottom longline fleet to target SWG species instead of DWG and tilefish during the early months of 2009 in an effort to reserve the DWG and

tilefish species for harvest later in the year. However, insufficient data exists to draw any conclusions at this time on possible behavioral change. As a result, this analysis does not incorporate any adjustments to target and harvest patterns in anticipation of such change and, as a result, may overestimate the effects of the proposed alternatives.

This analysis does not incorporate any potential effects of the implementation of an IFQ program for the harvest of grouper and tilefish in the reef fish fishery, as proposed by Amendment 29 (GMFMC 2008a). IFQ programs generally result in an increase in the ex-vessel price received for fish and NOR to fishery participants. The implementation of an IFQ program for these fisheries will not occur until January 2010. Therefore, the direct effects of the IFQ program would only be relevant for a portion of the expected period of effect of this proposed action. However, the expectation of the implementation of an IFQ program may have affected and continue to affect behavioral decisions prior to 2010 in response to the implementation of the proposed action because it may affect the incentive for fishermen to convert their gear or remain in the fishery. The IFQ program will give bottom longline fishermen the opportunity to actively fish their allocation, sell their allocation, or sell their shares. To actively fish their SWG allocation under the proposed action, affected bottom longline fishermen would need to either shift their effort to deeper waters or convert their gear, whereas selling their allocation would not require gear conversion, nor would selling their shares (thereby exiting the SWG portion of the reef fish fishery). The implementation of an IFQ program is expected to reduce the economic effects of the proposed action due to the expected higher prices and because grouper allocation and shares will be a sellable asset that the fishery participants did not previously possess. However, the resultant value of allocation and shares may not be as high as previously expected as a result of the proposed prohibition. As discussed below, harvests are expected to decline under the proposed action even with 100% gear conversion because vertical line gear has lower catch rates than longline gear. As a result, there may be more allocation available than the amount of grouper expected to be harvested. 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 the IFQ program is expected to mitigate the projected adverse economic effects of this proposed action by an unknown amount.

This analysis does not include any quantitative assessment of the proposed limitation on hooks. Suitable methods to quantitatively evaluate the effect of hook restrictions on harvest and economic performance have not been identified. Instead, the effects of the proposed hook restrictions are discussed qualitatively in the effects discussion below.

Finally, in addition to not incorporating any potential effects of the implementation of the IFQ program, this analysis does not include adjustments for current market or economic conditions. As previously discussed, the analysis is based fishing results from 2005-2008 as recorded in mandatory logbooks. The expected changes in the quantity of fish landed and NOR under the proposed alternatives reflect market and general economic conditions from that period. Although current economic conditions are discussed qualitatively in the following discussion, the current general economic decline could have already resulted in reduced demand for seafood products, leading to increased inventories and 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 any regulatory-induced gear conversion would be expected to force an economic inefficiency on the bottom longline sector, the resultant decrease in total reef fish harvests may assist in maintaining prices, countering some of the effects of declined product demand.

Effects Discussion

The results of the analysis are provided in Tables 4.3.1 through 4.3.5. These tables contain estimates of the historic average number of trips, ex-vessel revenues, and NOR for the bottom longline component of the reef fish fishery in the eastern Gulf of Mexico (Table 4.3.1) for 2005-2008; estimates of the expected number of affected bottom longline reef fish trips, the expected change in ex-vessel revenues (Table 4.3.2), and the expected change in NOR (Table 4.3.3) if the harvest of reef fish using bottom longline gear is prohibited in federal waters in statistical areas 1-8 in waters less than 35 fathoms; and estimates of the expected number of affected bottom longline reef fish trips, the expected change in ex-vessel revenues (Table 4.3.4), and the expected change in NOR (Table 4.3.5) if the harvest of reef fish using bottom longline gear is prohibited in federal waters in statistical areas 1-8 in waters less than 50 fathoms. The results for each scenario are provided by month; however, the results are presented as November-April rather than January-December to better match the potential period of implementation. Should implementation of any regulatory change occur sooner or be delayed, the expected effects can be recalculated from the information provided. Earlier or later implementation, however, would only be expected to affect the numerical results and not the ranking of alternatives.

The current emergency rule governing the fishery expires, unless extended, October 29. Ignoring the three-day difference between the effectiveness of the current emergency rule

Table 4.3.1. Historic average number of trips, ex-vessel revenues (millions, nominal dollars), and net operating revenues (millions), bottom longline component of the reef fish fishery, eastern Gulf of Mexico, 2005-2008.

Month	Trips	Revenues	NOR	Sum	Trips	Revenues	NOR
Nov	67	$0.73	$0.48				
Dec	69	$0.74	$0.48				
Jan	123	$1.44	$1.00				
Feb	99	$1.15	$0.79				
Mar	99	$1.19	$0.84				
Apr	115	$1.38	$0.97	Nov-Apr	572	$6.63	$4.55
May	125	$1.51	$1.06				
Jun	117	$1.16	$0.75				
Jul	98	$0.95	$0.60				
Aug	114	$1.03	$0.63				
Sep	97	$0.85	$0.50				
Oct	83	$0.75	$0.45	May-Oct	633	$6.25	$3.99
Annual	1,205	$12.87	$8.54	Annual	1,205	$12.87	$8.54

Table 4.3.2 Estimated change in ex-vessel revenues (millions, nominal dollars) from historic performance under a prohibition on the use of bottom longline gear targeting reef fish inside 35 fathoms. Values in ( ) represent reductions.

	Displaced Bottom	Gear Conversion Rate											
Month	Longline Trips	0%	Sum	20%	Sum	40%	Sum	60%	Sum	80%	Sum	100%	Sum
Nov	38	($0.38)		($0.33)		($0.28)		($0.23)		($0.18)		($0.13)	
Dec	50	($0.51)		($0.44)		($0.38)		($0.31)		($0.24)		($0.18)	
Jan	64	($0.72)		($0.65)		($0.58)		($0.51)		($0.44)		($0.37)	
Feb	47	($0.50)		($0.45)		($0.40)		($0.35)		($0.30)		($0.25)	
Mar	39	($0.46)		($0.41)		($0.36)		($0.31)		($0.26)		($0.21)	
Apr	70	($0.80)	($3.38)	($0.72)	($3.01)	($0.63)	($2.63)	($0.54)	($2.26)	($0.46)	($1.88)	($0.37)	($1.50)
May	65	($0.76)		($0.68)		($0.60)		($0.52)		($0.44)		($0.36)	
Jun	77	($0.73)		($0.64)		($0.56)		($0.48)		($0.39)		($0.31)	
Jul	74	($0.69)		($0.61)		($0.53)		($0.45)		($0.36)		($0.28)	
Aug	85	($0.75)		($0.66)		($0.57)		($0.48)		($0.40)		($0.31)	
Sep	69	($0.57)		($0.50)		($0.42)		($0.35)		($0.27)		($0.20)	
Oct	60	($0.53)	($4.03)	($0.47)	($3.56)	($0.41)	($3.09)	($0.35)	($2.62)	($0.28)	($2.15)	($0.22)	($1.68)
Annual	738	($7.41)	($7.41)	($6.57)	($6.57)	($5.72)	($5.72)	($4.87)	($4.87)	($4.03)	($4.03)	($3.18)	($3.18)

Table 4.3.3 Estimated change in net operating revenues (millions, nominal dollars) from historic performance under a prohibition on the use of bottom longline gear targeting reef fish inside 35 fathoms. Values in ( ) represent reductions.

	Displaced Bottom	Gear Conversion Rate											
Month	Longline Trips	0%	Sum	20%	Sum	40%	Sum	60%	Sum	80%	Sum	100%	Sum
Nov	38	($0.24)		($0.21)		($0.17)		($0.14)		($0.10)		($0.07)	
Dec	50	($0.33)		($0.29)		($0.24)		($0.20)		($0.16)		($0.11)	
Jan	64	($0.50)		($0.46)		($0.41)		($0.36)		($0.32)		($0.27)	
Feb	47	($0.34)		($0.31)		($0.28)		($0.25)		($0.21)		($0.18)	
Mar	39	($0.33)		($0.30)		($0.26)		($0.23)		($0.19)		($0.16)	
Apr	70	($0.56)	($2.32)	($0.50)	($2.06)	($0.44)	($1.81)	($0.38)	($1.56)	($0.32)	($1.30)	($0.26)	($1.05)
May	65	($0.53)		($0.48)		($0.43)		($0.38)		($0.32)		($0.27)	
Jun	77	($0.46)		($0.41)		($0.35)		($0.29)		($0.24)		($0.18)	
Jul	74	($0.44)		($0.38)		($0.33)		($0.28)		($0.22)		($0.17)	
Aug	85	($0.46)		($0.40)		($0.34)		($0.28)		($0.22)		($0.16)	
Sep	69	($0.33)		($0.28)		($0.23)		($0.18)		($0.13)		($0.07)	
Oct	60	($0.32)	($2.55)	($0.28)	($2.23)	($0.24)	($1.92)	($0.20)	($1.60)	($0.16)	($1.29)	($0.13)	($0.98)
Annual	738	($4.86)	($4.86)	($4.29)	($4.29)	($3.73)	($3.73)	($3.16)	($3.16)	($2.59)	($2.59)	($2.03)	($2.03)

Table 4.3.4 Estimated change in ex-vessel revenues (millions, nominal dollars) from historic performance under a prohibition on the use of bottom longline gear targeting reef fish inside 50 fathoms. Values in ( ) represent reductions.

	Displaced Bottom	Gear Conversion Rate											
Month	Longline Trips	0%	Sum	20%	Sum	40%	Sum	60%	Sum	80%	Sum	100%	Sum
Nov	54	($0.59)		($0.51)		($0.44)		($0.37)		($0.29)		($0.22)	
Dec	67	($0.72)		($0.63)		($0.54)		($0.45)		($0.36)		($0.28)	
Jan	90	($1.06)		($0.97)		($0.87)		($0.78)		($0.68)		($0.59)	
Feb	62	($0.71)		($0.64)		($0.58)		($0.51)		($0.45)		($0.38)	
Mar	52	($0.64)		($0.58)		($0.51)		($0.45)		($0.39)		($0.32)	
Apr	88	($1.02)	($4.74)	($0.92)	($4.25)	($0.81)	($3.75)	($0.70)	($3.26)	($0.59)	($2.76)	($0.48)	($2.27)
May	87	($1.01)		($0.91)		($0.81)		($0.70)		($0.60)		($0.50)	
Jun	101	($0.99)		($0.88)		($0.77)		($0.66)		($0.55)		($0.44)	
Jul	93	($0.92)		($0.81)		($0.71)		($0.60)		($0.50)		($0.39)	
Aug	111	($0.99)		($0.87)		($0.76)		($0.65)		($0.53)		($0.42)	
Sep	96	($0.83)		($0.73)		($0.62)		($0.52)		($0.42)		($0.31)	
Oct	79	($0.71)	($5.45)	($0.63)	($4.83)	($0.55)	($4.21)	($0.46)	($3.60)	($0.38)	($2.98)	($0.30)	($2.37)
Annual	978	($10.19)	($10.19)	($9.08)	($9.08)	($7.97)	($7.97)	($6.85)	($6.85)	($5.74)	($5.74)	($4.63)	($4.63)

Table 4.3.5 Estimated change in net operating revenues (millions, nominal dollars) from historic performance under a prohibition on the use of bottom longline gear targeting reef fish inside 50 fathoms. Values in ( ) represent reductions.

	Displaced Bottom	Gear Conversion Rate											
Month	Longline Trips	0%	Sum	20%	Sum	40%	Sum	60%	Sum	80%	Sum	100%	Sum
Nov	54	($0.38)		($0.33)		($0.28)		($0.23)		($0.18)		($0.13)	
Dec	67	($0.47)		($0.41)		($0.36)		($0.30)		($0.24)		($0.18)	
Jan	90	($0.75)		($0.69)		($0.63)		($0.56)		($0.50)		($0.44)	
Feb	62	($0.50)		($0.45)		($0.41)		($0.37)		($0.33)		($0.29)	
Mar	52	($0.46)		($0.42)		($0.37)		($0.33)		($0.29)		($0.24)	
Apr	88	($0.72)	($3.29)	($0.64)	($2.95)	($0.57)	($2.62)	($0.49)	($2.29)	($0.42)	($1.96)	($0.34)	($1.62)
May	87	($0.70)		($0.63)		($0.57)		($0.50)		($0.43)		($0.37)	
Jun	101	($0.64)		($0.56)		($0.49)		($0.42)		($0.34)		($0.27)	
Jul	93	($0.59)		($0.52)		($0.45)		($0.38)		($0.31)		($0.24)	
Aug	111	($0.60)		($0.52)		($0.45)		($0.37)		($0.29)		($0.21)	
Sep	96	($0.49)		($0.42)		($0.35)		($0.27)		($0.20)		($0.13)	
Oct	79	($0.42)	($3.44)	($0.37)	($3.03)	($0.32)	($2.62)	($0.27)	($2.20)	($0.22)	($1.79)	($0.17)	($1.38)
Annual	978	($6.73)	($6.73)	($5.98)	($5.98)	($5.24)	($5.24)	($4.49)	($4.49)	($3.75)	($3.75)	($3.00)	($3.00)

and the total number of days in the month, the expected performance in the fishery for November-April under **Alternative 1** (no action) is a return to historic harvests, producing approximately $6.63 million in ex-vessel revenues (nominal dollars) and $4.55 million in NOR (Table 4.3.1). These values may be reduced by an unknown amount if vessels that converted their gear during the period of implementation of the emergency rule choose to not return to the bottom longline component of the reef fish fishery, bottom longline vessels apply more effort than historic patterns upon the re-opening of the fishery, or vessels that could not economically survive the restrictions of the emergency rule are not able to return to the fishery.

The expected effects of **Preferred Alternative 2** vary with the expected rate of gear conversion. Implementation of **Preferred Alternative 2** would be expected to result in a reduction in ex-vessel revenues relative to **Alternative 1** for November-April of approximately $1.5million (100% gear conversion) to $3.38 million (0 % gear conversion) (Table 4.3.2). This reduction would be expected to increase to a total of $3.18 million to $7.41 million under the respective gear conversion rates if the prohibition is extended to a full year.

Preferred Alternative 2 would be expected to result in a reduction in NOR relative to **Alternative 1** for November-April of approximately $1.05 million (100 % gear conversion) to $2.32 million (0 % gear conversion) (Table 4.3.3). This reduction would be expected to increase to a total of $2.03 million to $4.86 million under the respective gear conversion rates if the prohibition is extended to a full year.

Actual conversion rates would be expected to be affected by the level of historic activity in the fishery (vessels with higher average annual landings would be expected to have greater access to the funds required for conversion and more incentive to convert in order to remain active in the fishery) and the expected duration of the prohibition (the longer the expected duration, the more time available to make the conversion and the greater the incentive to convert). Some vessels have already converted in response to the emergency rule, while others may have waited to see whether the prohibition would be extended, altered, or lifted. Also, the availability of funds to pay for conversion, or lack thereof, cannot be overlooked. Given current economic conditions, vessels that wish to convert may not be able to acquire sufficient funds, particularly if they require loans, to do so. This may be especially true 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). Overall, however, it is unknown how many vessels have successfully converted, are in the process of conversion, or will seek to convert. Nevertheless, assuming the 40 % and 60 % gear conversion rates bracket the reasonable expected rate of conversion, the average expected reduction in ex-vessel revenues and NOR range from $2.26 million to $2.63 million and $1.56 million to $1.81 million for the two performance measures, respectively.

The expected reductions in revenues under the alternative scenarios for **Preferred Alternative 2** are indicative of a key effect of the prohibition, even under an assumed 100 % gear conversion. Assuming no increase in catch rates by vertical line vessels, this alternative is projected to result

in a substantial reduction in reef fish harvests, reducing not only revenues to fishermen but also decreased product availability to markets and consumers. Although reef fish availability and prices are largely dominated by imports, the decrease in fresh domestic wild harvest supplies would be expected to have additional unquantifiable adverse economic effects. However, the issue of potential market gluts and declining demand for seafood due to the general decline in the economy, as discussed above, should be recalled.

Over the period 2005-2007, grouper and tilefish harvested by reef fish bottom longline gear off west Florida comprised approximately 18 % of the volume in terms of pounds of all marine species purchased (NMFS Accumulated Landings System data; average of approximately 4.8 million pounds of grouper and tilefish per year out of approximately 27.1 million pounds of all species) for dealers who purchased these species and approximately 21 % in terms of value (nominal dollars; approximately $11.1 million for groupers and tilefish out of approximately $51.9 million from all species). These results are summarized across all dealers who purchase longline-harvested groupers and tilefish, or approximately 37 dealers per year. While this demonstrates a substantial reliance on the fishery for the average dealer, it is expected that some dealers are even more dependent on the grouper and tilefish harvests, particularly those in certain high volume areas that cater to certain gear fleets. Although the bottom longline sector does not account for all of these grouper and tilefish harvests, this sector dominates the DWG and tilefish landings, and also harvests more SWG than the vertical line sector (Section 3.3.1 and NMFS 2009a). As a result, although gear conversion would be expected to mitigate the reduction of some product flow, interruption of the traditional longline harvests would be expected to have substantial shore-side effects on dealers closely tied to this sector.

In addition to the expected reductions in NOR and economic activity associated with the expected decrease in fresh domestic supplies under **Preferred Alternative 2**, the projected reductions in 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 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 vertical line bandit gear is approximately $13,750. Assuming 103-111 vessels converted their gear (100 % conversion; see the discussion on vessel numbers in the methodology discussion above), the estimated total cost to the fleet would be approximately $1.42-$1.53 million. This may substantially overestimate the actual cost as some longline vessels have both gears already on board, though not necessarily in the full arrangement that a completely converted vessel would have, and 100 % conversion would not be expected. While gear conversion expenditures 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 longline vessels have a substantial financial investment in their current gear, which would have reduced value under the proposed action.

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 (six months and extendable to one year), 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.

As discussed in the methodology section above, these results do not factor in any effects of the proposed restriction on the number of hooks. The economic effects of hook limitation cannot be quantified with available data. However, hook limitations would be expected to reduce the 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 would 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. It should also be noted that these harvest inefficiencies may also be imposed on shark vessels that possess a commercial reef fish permit. Even if fishing for sharks, these vessels would be subject to the limitation on the number of hooks. While this analysis incorporates estimates of the economic effects of the loss of reef fish revenues on shark trips, it does not capture the effects of hook restrictions on these trips.

While the economic effects on the fishery are expected to be greater under **Preferred Alternative 2** relative to **Alternative 1**, **Preferred Alternative 2** is estimated to reduce loggerhead sea turtle mortality by 40% during the expected period of implementation **Alternative 1**. The economic benefits of such reduction are indeterminate.

Alternative 3 would extend the emergency rule for an additional 186 days and, because of the more restrictive prohibition, would be expected to result in greater adverse economic effects than **Preferred Alternative 2**. As seen in Tables 4.3.4 and 4.3.5, a November-April extension of the emergency rule would be expected to result in a reduction in ex-vessel revenues of approximately $2.27 million to $4.74 million relative to **Alternative 1**, and a reduction in NOR of approximately $1.62 million to $3.29 million. The discussion points raised with respect to conversion rates, market effects, and other shore-side effects for **Preferred Alternative 2** are relevant for **Alternative 3** and increase in importance due to the increased restrictiveness of **Alternative 3**.

4.4 Direct and Indirect Effects on the Social Environment

Although the social effects are different in nature than economic effects, in general they are directly related. Therefore, the greater the expected adverse economic effects, the greater the expected adverse social effects. However, social behavior is not directly related to economic impacts as human populations are diverse and differ according to a variety of common characteristics including race, gender, religion, socioeconomic class, and a whole host of other characteristics related to culture, history, beliefs, etc. Fishermen and their communities also differ according to type of fishing, type of vessel and gear and other characteristics that pertain to the harvest and processing of seafood. Overall, regardless of the characteristics of an industry or community, the current economic environment has created severe social and economic stress across all communities and sectors of the economy, such that the social effects of regulatory change are likely to be magnified. For instance, the state of Florida's unemployment rate went from 6.3% in July of 2008 to 10.7% in July of 2009 according to the Bureau of Labor Statistics. During this same period the Bradenton-Sarasota-Venice Metropolitan Area went from a 7.3% unemployment rate to an 11.8% rate. The Tampa-St. Petersburg-Clearwater, FL Metropolitan Statistical Area saw an increase from 6.9% to 11.3% unemployment rate during the same time period (http://www.bls.gov/web/laumstch.htm accessed September 8, 2009).[10] These are significant increases that will amplify the vulnerability of the general population in these areas and diminish the resilience of the communities within. Overall, the current economic climate will exacerbate any adverse impacts that are implemented here.

Profiles of representative communities substantially involved in fishing for shallow water grouper potentially affected by this proposed action are provided in Section 3.4. Although more than 70 Gulf and central Florida communities have been identified with recorded landings of the species expected to be affected by this action, the effects of this action could affect the entire Gulf Florida grouper and tilefish sector. An average of 37 dealers per year from 2005 through 2007 in this area were identified as having purchased grouper and tilefish harvested using bottom reef fish longline gear in Gulf waters off Florida. This might suggest, as discussed above, greater opportunity to minimize or mitigate potential adverse economic and social effects. However, as alluded to above and in Section 3.4, there are several communities that have relied more on this fishery in recent years and the current economic conditions could be expected to magnify the adverse effects of any regulatory action discussed here.

With **Alternative 1**, the fishery would revert to the status quo prior to the implementation of the Amendment 31 or other long-term mitigation measures. As discussed in Section 3.4 to mitigate the impacts of the closure under the emergency rule, some vessel owners have switched to vertical line gear to continue fishing within the closed area. Others have tied up their vessel or moved to an open area in deeper waters or an entirely different fishery. In the mean time, the Council has chosen a suite of preferred alternatives to be considered in Amendment 31 to the

10 Unemployment figures from the BLS are more current and are used here to highlight the recent upward trend in unemployment due to the economic recession and should not be compared to the census data within the community profiles. Bureau of Labor Statistics (BLS) unemployment figures are often lower than those used by the Census Bureau. This is due to the manner in which unemployment is calculated by both agencies. Unemployment figures used within the community profiles is based upon the Census data collection and likely higher than figures used by the BLS presented here. For more information on the difference see http://www.bls.gov/lau/censusdiff.htm

Reef Fish FMP that is pending submission and approval by NMFS. Because **Alternative 1** would be expected to return the fishery to a previous state with no restrictions on the use of longline gear in the area outside of 20 fathoms, continued or higher take of threatened sea turtles can be expected. The social value of these sea turtles is indeterminate, but expected to be positive, and the effect of continued increased take until permanent action can be taken on species recovery is not known. However, continued take of these sea turtles at current levels would likely lead the fishery to exceed the incidental take authorized in the 2009 BiOp, which would require more restrictive measures that could include a complete closure of the fishery. Although fishermen and other constituents also value sea turtles, and society at large also values fishermen and the products and services they provide, addressing sea turtle take and the needs of fishermen requires a situation of compromise. Some reduction in sea turtle takes is needed, while taking into consideration the economic and social impacts of such action. **Alternative 1**, however, could be construed as inaction rather than compromise and might be expected to increase, rather than decrease, the conflict between the different constituent groups. Any benefit to fishermen would likely be short lived as more restrictive action would likely follow.

The expected social impacts of **Preferred Alternative 2** would be a lessening of impacts imposed by the emergency rule through the allowance of some longline fishing within the closed area until more permanent action is implemented through Amendment 31 or other long-term mitigation measures. The area allowable to fish would be restricted from what would be allowed in **Alternative 1** by only allowing fishing beyond the 35 fathom contour line. The alternative further limits fishing effort by limiting hooks fished to 750. In combination, this alternative is expected to substantially reduce the interactions with sea turtles until more permanent action it implemented.

Limiting the number of hooks in **Preferred Alternative 2** has been suggested by industry as one way to reduce the interaction with sea turtles. In, fact, the industry had submitted proposals to test various gear modifications to measure whether or not they actually do reduce the interactions with sea turtles. Furthermore, industry representatives have indicated that gear modifications would be preferred to other actions by the Council or Agency to reduce interactions with sea turtles; however it is unlikely that gear modifications alone would have been enough to reduce the incidental take of sea turtles to an acceptable level.

The Council has chosen to limit hooks to 1000 hooks of which no more than 750 can be rigged for fishing or fished at any given time as part of their preferred suite of alternatives in Amendment 31 which is the same rulemaking analyzed here. One industry representative indicated that fishing 1000 hooks has on average a mainline length between 6-7 miles, therefore with a maximum of 750 hooks, for those operations that used longer mainlines, mainline length may be shortened to accommodate per mile was about the minimum used by the industry. If hooks are spaced out any further less catch occurs as fish are often congregated around one area. The average mainline length may decrease with the restrictions for fewer hooks. With a reduction in mainline length there may be a change in fishing behavior that may include an increased number of sets which may in turn cause increased activity for the crew and possibly less downtime between sets. It could also negate some gains in reducing the interactions with sea turtles as those vessels increase their number of sets if catch per unit of effort is less than expected.

Limiting fishing beyond 35 fathoms is expected to reduce sea turtle interactions as approximately 76% of all observed sea turtle interactions occurred in less than 35 fathoms as did the majority of longline sets. This action was part of a suite of preferred alternatives developed by industry and non-profits during the early development of Amendment 31. It is anticipated that much of the longline effort would shift into the areas outside of 35 fathoms, although to what extent is unknown. With more permanent reductions in the longline fleet included proposed in Amendment 31, some vessels may not shift their effort outside of 35 fathoms and instead convert to vertical line gear or use buoy gear. However, as discussed in Section 3.4, the conversion to vertical line gear has been difficult for many captains (see further discussion below under **Alternative 3**).

The social effects of **Alternative 3** would stem from the prohibition of the use of bottom longline gear in waters 50 fathoms or less east of Cape San Blas and have significant social impacts. It is likely that the impacts from this action would close several businesses and cause many fishermen to seek alternative employment. The social effects would depend on a variety of factors, including the ability to convert to vertical line gear and resultant catch rates, by both converted and historical vertical line vessels. It is not known how many vessels would be capable of changing to vertical line gear. One 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 using vertical line gear. 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 longline captains have been unable to successfully make that transition and have had 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 rates have had significant impacts upon fish houses that own a fleet of vessels since implementation of the emergency rule. Some industry representatives have suggested that with current economic conditions and other regulatory actions this measure could force them out of business (B. Spaeth and K. Bell, personal communication).

Although the general absence of alternative employment opportunities due to current economic conditions may provide a strong incentive to convert to vertical line gear and continue fishing, the ability to do so may be severely restricted due to the cost. Fishermen may not be able to self-finance gear conversion and banks or suppliers may be reluctant to provide loans or extend sufficient credit. Although gear conversion to vertical lines would allow some individuals to continue fishing, the net impact of conversion on employment is not known. Some money has been made available by environmental non-profit groups for gear conversion of the longline fleet and the number of vessels that have received funds for conversion so far has been around 40. There have been only 3 vessels so far that have completed the conversion and it is hoped that 50 total will be able to take advantage of the financial assistance (Heather Paffe, EDF, personal communication).

The average crew size for a vertical line vessel is two persons, and it is unknown whether a converted longline vessel would continue to use the larger number of crew. Because vertical line vessels harvest fewer fish per trip than longline vessels, crew size of converted vessels is likely

to decline, resulting in some affected longline fishermen looking for alternative employment. Only the most skilled crew are likely to be retained, exacerbating shore-side problems if those less skilled at fishing are also those least likely to be able to find alternative employment. The number of affected individuals in associated businesses and communities is unknown.

The proposed action has the potential to move some longline vessels to deeper, more offshore waters which can be expected to increase the safety risks associated with operations at sea. However, many vessels are expected to convert to hook-and-line gear and fish closer to shore which is expected to improve safety for fishery participants.

Similar to the discussion of the economic effects, the implementation of an IFQ program for the harvest of grouper and tilefish would be expected to mitigate some of the expected adverse social effects of this proposed action. Increased opportunity to remain in the fishery or exit under more favorable conditions, i.e., selling one's IFQ shares, would be expected to result in an increased opportunity of choice, reduced stress, and overall reduced adverse social effects than if no IFQ program is implemented.

The net social effect of the reductions in harvests, revenues, and expenditures could be substantial. Impacts of the current closure have reportedly been harsh according to fish house owners and operators. 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 weather the short-term reductions in product supply and sales activity. 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 the longline vessels targeted by this action and the dealers, processors, or suppliers that conduct business with these vessels, but also the participants in all other fisheries or gear sectors that deal with these businesses. Although the public has demonstrated a general willingness to substitute other domestically harvested or imported species (though niche markets and some consumers are more discriminating in their selections), such that people should generally be able to continue to satisfy their seafood demands, the potential domino effect, extending to a wider variety of species than harvested by the subject gear, could be substantial. As noted previously, a business that goes under due the disruption of a species group that comprises 20 % of its business would also result in disruption of the markets for the species that comprise the other 80%.

The adverse social effects of the reduced economic activity would be expected to ripple through the local communities, adding pressure on already stressed social support services. Unemployment would be expected to increase, leading to increased mortgage, credit card, car payment, and other consumer or business debt defaults.

Because society values sea turtles and other natural resources, the reduction in the take and mortality of threatened sea turtles would be expected to result in unquantifiable social benefits to society. It is unknown, however, how these compare to the adverse social effects expected to accrue to the fishery and associated industries and communities and a net social outcome as a result of **Alternative 3** is likely detrimental and severe.

4.5 Direct and Indirect Effects on Environmental Justice

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 bottom longline component of the reef 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 action. 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 action 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 action. 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 action are expected to be positive. This proposed action 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 sector of the reef fish fishery. Reduced mortality of these species would be expected to increase the ecological benefits these species contribute to the marine environment its general health and condition.

4.6 Direct and Indirect Effects on the Administrative Environment

Proposed bycatch minimization measures are not expected to significantly impact administrative costs. 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 implementing appropriate management measures for addressing the bycatch of sea turtles. The enforcement of **Preferred Alternative 2** would require the enforcement of the 35 fathom line rather than the current 20 fathom line (Figure 2.1). Changes in the closed area boundary would not require any new administrative action. 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. However, as of May 6, 2007, all commercial reef fish vessels were required to have VMS. The VMS information may assist law enforcement with monitoring the longline activities. Additionally, **Preferred Alternative 2** requires the enforcement of 1,000 hooks per vessel with 750 hooks rigged for fishing at any given time. This may increase the average time for the vessel inspection due to the need for determining the number of hooks onboard. Although this alternative may increase the impact on the administrative environment, the short-term of the proposed rulemaking would negate a long-term significant impact. **Alternative 3** would require law enforcement continue enforcing the 50-fathom line rather than the 20 fathom line for an additional 186 days during the extension of the emergency rule. This is not expected to have a significant impact on the administrative environment.

Long-term bycatch minimization measures would require additional research to determine the magnitude and extent of reductions in bycatch and bycatch mortality. Additional monitoring required for sea turtle bycatch may include continued observer monitoring and logbook analysis. The implementation of this proposed rule is not anticipated to cause an increase of work associated with permits. Overall, the increase of work on the administrative environment is not likely to be significant.

4.7 Mitigation, Monitoring and Enforcement Measures

The process of reducing loggerhead sea turtle takes in the bottom longline component of the reef fish fishery through this proposed rulemaking is expected to have a negative short-term effect on the social and economic 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 and more immediate long-term benefits. These would be determined by actions taken by the Council in Amendment 31. 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 reviews of sea turtle interactions within fisheries 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 fishery practices not achieve needed take reductions. Data collected for these reviews come from logbooks and observer studies 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. The type of rulemaking vehicle the NMFS or the Council determine 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.

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, this proposed rulemaking includes alternative to expand existing restricted fishing. To improve enforceability of these areas, the Council has established a VMS program for the commercial sector of the reef fish fishery to improve enforcement. VMS allows NMFS enforcement personnel to monitor compliance with these area-specific regulations, and track and prosecute violations.

4.8 Cumulative Effect Analysis (CEA)

As directed by NEPA, federal agencies are mandated to assess not only the indirect and direct impacts, but cumulative impacts of actions as well. 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.

Detailed CEAs for the reef fish fishery have been conducted in recent amendments to the FMP (Amendments 27, 29, 30A, 30B, and 31) and are incorporated here by reference. These CEAs evaluated the immediate areas affected by the actions and includes the federal waters of the Gulf. Time frames used for the analysis vary by each amendment; however, landing data available for analysis of stock status ranges from 1963 to present for commercial landings and 1981 to present for recreational landings. A history of management is provided in each amendment beginning with the establishment of the Reef Fish FMP in 1981. With respect to hardshell sea turtles, some species have been listed as endangered since 1970 through the ESA, and sea turtle populations have been assessed by NMFS since 1995. Reasonably foreseeable future actions (RFFA) include: A listing petition to revise the status of loggerhead sea turtles to endangered; an identification by NMFS that several gear types need to be addressed to reduce incidental capture of sea turtles; assessments for gag and red grouper update in 2009, a red snapper assessment update in 2009, and SEDAR assessments for yellowedge grouper and tilefish scheduled for 2010; Amendment 28 to the Reef Fish FMP to examine fair and equitable ways to allocate all FMP resources between recreational and commercial sectors of the reef fish fishery; a generic amendment to address annual catch limits (ACLs) and corresponding accountability measures (AMs); and Reef Fish Amendment 32 to address potential management changes needed as a result of the red grouper and gag SEDAR updates.

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 rule. 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). The following is a summary of VECs identified as being affected by this action.

Habitat - Damage caused from reef fish fishing, while minor, is associated with the level of fishing effort. 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 such as Amendments 22, 27/14 (red snapper), 23 (vermilion snapper), 30B, Secretarial Amendment 1 (grouper), and 30A and Secretarial Amendment 2 (greater amberjack), which have reduced fishing effort for some species, and possibly the fishery on the whole, have had a positive effect on hard bottom habitats. RFFAs, such as Amendment 31 and the development of ACLs and AMs, should also benefit these habitats as they would also reduce or limit fishing effort. Reef fish and sea turtle EFH, particularly coral reefs and submerged aquatic vegetation,

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 habitat area of particular concern (HAPC) designations 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.

Managed resources - In the past, the lack of management of reef fish has allowed many stocks to undergo both growth and recruitment overfishing and has allowed some stocks to decline (see section 3.2 for a description of the species). Present management measures have allowed many of these stocks to rebuild to a point where the stock is no longer considered overfished (e.g., red grouper). In some cases, measures were inadequate to prevent overfishing (e.g., gag), and so more measures were needed to protect the stock. Fishery management RFFAs are expected to benefit managed species. For example, ACLs and AMs are intended to develop triggers for action to be taken immediately should a stock appear to be approaching an overfishing condition. Non-fishing activities are likely to adversely affect reef fish stocks. Liquefied natural gas facilities are being proposed in the western and northern Gulf. These facilities can have a negative effect on species with pelagic larvae, like most reef fish species. To mitigate the affects of these facilities, regulatory agencies are proposing closed-loop rather than open-loop systems. At this time, the effect 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 could have a detrimental effect on reef fish species.

Protected resources – Some protected resources are not susceptible to the reef fish fishery; however, interactions between sea turtles and smalltooth sawfish do occur. Loggerhead sea turtles in particular have been shown to be susceptible to being hooked by bottom longlines. The complexity of the loggerhead 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. In addition, anthropogenic activities can affect the success of nesting and hatching such as: 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. Secondary threats to nesting from human activities include the introduction of exotic fire ants, feral hogs, dogs, and an increased presence on beaches. Additionally, if sea levels rise as a result of climate change, available beach habitat for nesting might be diminished in developed areas (NMFS and USFWS 2008).

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, poaching, and fishery interactions. Loggerhead sea turtles in the pelagic environment are exposed to a series of longline fisheries. These include the Atlantic HMS 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 sea turtle excluder devices in shrimp trawls (FMP for the Shrimp Fishery of the Gulf), the requirement of sea turtle-release gear on federally permitted reef fish vessels (Amendment 18A), and circle hook and dehooker requirements for reef fish fishing, although this latter requirement was not designed specifically to reduce sea turtle take (Amendment 27/14). The Council has approved Amendment 31 that contains measures to address sea turtle interactions with bottom longline gear. The 2009 BiOp concluded the continued authorization of the fishery under the actions proposed in both this rulemaking and Amendment 31 would not jeopardize the continued existence of sea turtles or other listed species.

Commercial fishery-Adverse or beneficial effects of actions to vessel owners, captains, and crew are tied to the ability for a vessel to make money. In commercial fisheries, these benefits are usually derived in terms of shares awarded after fishing expenses are accounted for. The greater the difference between expenses and payment for caught fish, the more revenue is generated by the fishing vessel. Relative to this rule, the commercial fishery has benefited from past actions in the reef fish fishery. By being able to harvest these species unhindered by regulations prior to 1990, many vessels have been able to enter the fishery. However, in constraining harvest to a sustainable level, current management measures have had a negative, short-term impact on the commercial sector of the reef fish fishery. Permit and landing restrictions were needed to keep the commercial harvest within its quota for applicable species. Quota closures have limited the number of trips vessels may take. Further compounding the negative effects on the fishery are imports. Imports on domestic fisheries can cause fishermen to lose markets through fishery closures as dealers and processors use imports to meet demand, and limit the price fishermen can receive for their products through competitive pricing of imports. Although many RFFAs are likely to have a short-term negative impact on the commercial sector of the reef fish fishery, the goal of management is to allow stocks to be harvested at higher, sustainable levels for those stocks being rebuilt while minimizing bycatch. In addition, the development of IFQs should allow individual fishermen to fish their shares when and where they want, and as a result, prices for landed fish are expected to increase as observed in other IFQ programs (GMFMC 2006). However, actions to reduce take proposed in Amendment 31 are likely to have a negative effect on the bottom longline component of the reef fish fishery. Vessel operators who can adapt to the resultant regulations either by longlining within the amendment's constraints or by changing gears, would likely be successful. Non-management related RFFAs which could affect the commercial sector of the reef fish fishery include hurricanes and increases in fishing costs (e.g., fuel). 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.

4.9 Unavoidable Adverse Effects

Sea turtle takes must be reduced to satisfy the requirements of the Magnuson-Stevens Act and ESA. As a result, many of the current participants in the bottom longline segment of the reef fish fishery may never recuperate losses incurred from the more restrictive management actions imposed in the short-term. If the Council can develop long-term measures to reduce takes that have less negative effects, fewer participants may be negatively affected. Other means to continue in the fishery would be to convert to less harmful gear types (e.g., vertical gear) or participate in other fisheries during times or places when reef fish bottom longlining fishing is not allowed.

Actions considered in this rule 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. Longline gear would still be allowed, just at deeper depths. Unique characteristics of the geographic area are highlighted in Section 3. Adverse effects of fishing activities on the physical environment are described in detail in Section 4.1. These sections conclude little impact on the physical environment should occur from the temporary action proposed in this document. Uncertainty and risk associated with the measures are described in detail in Sections 4.1-4.5 as well as assumptions underlying the analyses.

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

The objective of this rule is to reduce the sea turtle take by the bottom longline component of the reef fish fishery in the eastern Gulf over the short term while NMFS evaluates long-term measures developed by the Council to achieve the same objective. For loggerhead sea turtles, this focuses on the long-term goal of protecting this population from further declines. The relationship between short-term economic uses and long-term economic productivity are discussed in the preceding section and Section 4.3.

4.11 Irreversible and Irretrievable Commitments of Resources

There are no irreversible or irretrievable commitments of agency resources proposed herein. The action to reduce sea turtle bycatch is readily changeable by future fishery management actions. 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 some sectors of the fishery caused by area restrictions.

4.12 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 3 and 4. Items a, b, and d are directly discussed in Section 4. Item e is discussed in economic analyses. Alternatives that encourage fewer fishing trips would result in energy conservation. Item f is discussed throughout the document as sea turtle and fish populations are a natural and depletable resource. A goal of this rule is to protect loggerhead sea turtles for the Nation. Mitigation measures (item h) are discussed in Section 4.6.

The other elements are not applicable to the actions taken in this document. Because this rule concerns the management of loggerhead sea turtles, 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 goal of this rule is to reduce take of loggerhead sea turtles by the bottom longline component of the reef fish fishery. This is a goal the federal government shares with regional and state management agencies (see Section 3.5). 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 rule. The actions taken in this rule will affect a marine species and the reef fish fishery, and should not affect land-based, urban environments.

The incidental take authorized in the governing BiOp was analyzed for the entire reef fish fishery relative to its impacts on threatened and endangered species. The need for the current emergency rule and the proposed rule are a direct result of the fact that the amount of incidental taking specified in the previous BiOp has been exceeded in the fishery. The emergency rule and this proposed rule are intended to result in short term changes to the prosecution of the fishery, and those changes are specifically designed to reduce the impacts to listed species and critical habitat. The impacts from the emergency rule and the proposed rule are entirely beneficial to listed species and critical habitat; therefore, implementation of the emergency rule and this proposed rule will not alter the determinations contained in a January 9, 2009, memorandum relative to sections 7(a)(2) or 7(d) of the ESA. Further, the short term beneficial impacts of the proposed rule, as well as the continued operation of the fishery into the near future are specifically addressed in the most recent BiOp.

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, and is classified in the 2008 List of Fisheries (73 FR 73032) as

Category III fishery. 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 nonindigenous species should not occur.

5.0 REGULATORY IMPACT REVIEW

5.1 Introduction

NMFS conducts a Regulatory Impact Review (RIR) as required by Executive Order 12866, as amended. The RIR: (1) Provides a comprehensive review of the incidence and level of impacts associated with a proposed or final regulatory action; (2) provides a review of the problems and the policy objectives prompting the regulatory proposals and an evaluation of alternatives that could be used to solve the problem; and (3) 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 provides the information needed to determine if the proposed regulations constitute a significant regulatory action under Executive Order 12866.

5.2 Problems and Objectives

The purpose and need of this action are discussed in Section 1.2 and are incorporated herein by reference. In summary, the number of loggerhead sea turtle takes authorized in the 2005 BiOp on the bottom longline component of the reef fish fishery in the Gulf have 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 Magnuson-Stevens Act, 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 Council selected their preferred alternatives for long-term measures to reduce sea turtle bycatch at their August 2009 meeting. The measures selected are expected to be sufficient to achieve the necessary reduction in bycatch and bycatch mortality of sea turtles and are less restrictive than the measures established by an emergency rule effective May 18, 2009, which prohibited bottom longline fishing for reef fish east of 85^{o}30'W (near Cape San Blas, Florida) in waters less than 50 fathoms. This action is necessary to allow fishing with bottom longline gear to resume, consistent with the long-term measures the Council has selected, until such time as the measures the Council has selected can be implemented, thereby reducing the adverse economic effects of the current prohibition implemented under emergency rule.

5.3 Description of the Fishery

A description of the Gulf bottom longline component of the reef fish fishery is contained in Section 3.3.1 and is incorporated herein by reference.

5.4 Methodology and Framework for Analysis

The methodology and framework for this analysis is described in Section 4.3 and is incorporated herein by reference.

5.5 Impacts of the Proposed Action

A more detailed discussion of the expected impacts of this proposed action is included in Section 4.3 and is incorporated herein by reference. This proposed action is expected to result in a reduction in net operating revenues (NOR) to vessels in the bottom longline component of the reef fish fishery by approximately $1.05 million (November-April prohibition and 100% gear conversion) to $2.32 million (November-April prohibition and 0 % gear conversion), depending on the amount of gear conversion by affected longline vessels to vertical line gear. Extension of the prohibition to a full year would increase the reduction in NOR to $3.18 million (100% conversion) to $7.41 million (0% gear conversion). Actual conversion rates would be expected to be affected by the level of current activity in the fishery by an individual fishing vessel, the expected duration of the prohibition, and the availability of funds for conversion. Assuming 40% to 60% of the vessels convert to vertical line gear, the expected reduction in NOR ranges from $1.56 million (60% gear conversion) to $1.81 million (40% gear conversion).

In addition to the reduction in NOR, this proposed action is expected to result in a net short-term reduction in reef fish harvests, resulting in decreased product availability to markets and consumers. Although reef fish availability and prices are largely dominated by imports, the decrease in fresh domestic wild harvest supplies would be expected to have additional unquantified adverse economic effects.

Overall, grouper and tilefish harvests comprise a substantial portion of the total volume of sales of many dealers, accounting for approximately 18% in terms of pounds and approximately 21% in terms of value for dealers that purchase these species harvested by bottom longline reef fish gear. As a result, the expected interruption of traditional longline harvests as a result of this action is expected to have substantial shore-side effects on dealers closely tied to this sector.

This action is also expected to result in additional unquantified reductions in economic activity associated with changes in trip costs. These effects would be mitigated by recovered expenditure flows associated with gear conversion and the trip costs for new vertical line trips. However, the actual rates of conversion, conversion costs, and trip increases are either speculative or unknown, so the net effects of such changes have not been estimated. Longline vessels currently have a substantial financial investment in their longline gear, which would have reduced value under this action.

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 (six months and extendable to one year), the severity of the possible disruptions could have long-term implications as some affected entities may not be able to economically survive.

It should be noted that, although these effects represent economic losses to the fishery and associated industries relative to the status quo, under which the fishery would be allowed to revert to historic fishing patterns after having been subject to substantial harvest restriction implemented through emergency rule on May 18, 2009, the proposed action is less restrictive,

and would be expected to result in less severe economic effects, than the emergency rule, which could be extended for an additional 186 days.

This action is, however, expected to result in the reduced take and mortality of threatened sea turtles. The net effect of the reduction in take and mortality of threatened sea turtles in terms of number of animals and effects on stock status is not known and the economic benefits of the reduction in sea turtle take and mortality is indeterminate.

5.6 Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources which can be expressed as costs associated with the regulations. Costs associated with this action include:

Council costs of document preparation, meetings, public hearings, and information dissemination 0

NMFS administrative costs of document preparation, meetings, and review .....$ 12,000

Law enforcement costs 0

TOTAL .....$ 12,000

The document preparation, review, and administrative costs for this action are limited to NMFS staff. Although the implementation of any new regulation may result in re-allocation of law enforcement time and priorities, no additional costs have been identified as necessary to enforce the proposed action.

5.7 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 regulatory action has been determined to not be economically significant for purposes of E.O. 12866.

6.0 OTHER APPLICABLE LAWS

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. The Magnuson-Stevens Act (16 U.S.C. 1801 et seq.) provides the authority for fishery management in federal waters of the EEZ. However, protected species and fisheries 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 marine resources. Major laws affecting federal resource 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 proposed rule is consistent with the Coastal Zone Management program of the state of Florida to the maximum extent possible. Their determination will then be submitted to the responsible state agency under Section 307 of the CZMA administering approved Coastal Zone Management programs.

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 to managing fisheries and protected species and the use of best available information is the second national standard under the Magnuson-Stevens Act. 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.

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 proposed rule required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries, and studies of pinniped-fishery interactions.

Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. The categorization of a fishery in the LOF determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. The MMPA relative to this action is discussed in Sections 3.2.4 (identification of marine mammals in the Gulf) and 4.11 (longlining relative to marine mammals).

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. Rulemaking under this action would not contain a collection-of-information requirement for purposes of the PRA

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 the rulemaking from this action.

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. This assessment is made in Section 5.0.

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 rule. This requirement is addressed in Section 4.5.

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 rule. Possible effects on the physical and biological environments are discussed in Section 4.

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.

No Federalism issues have been identified relative to the action proposed in this rule. 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. The existing 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. The action analyzed in this EA has no MPA implications.

Essential Fish Habitat

The amended Magnuson-Stevens Act 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 approved an EIS (GMFMC 2004a) to address the new EFH requirements contained within the Magnuson-Stevens Act. Section 305(b)(2) requires federal agencies to obtain a consultation for any action that may adversely affect EFH.

7.0 REFERENCES

Ackerman, R.A. 1997. The nest environment and embryonic development of sea turtles. pp 83-106. In: Lutz, P.L. and J.A. Musick (editors), The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Acropora Biological Review Team. 2005. Atlantic *Acropora* Status Review Document. Report to National Marine Fisheries Service, Southeast Regional Office. March 3. 152 p + App

Addison, D.S. and B. Morford. 1996. Sea turtle nesting activity on the Cay Sal Bank, Bahamas. Bahamas Journal of Science 3:31-36.

Ault, J. S., S. G. Smith, G. A. Diaz, and E. Franklin. 2003. Florida hogfish fishery stock assessment. University of Miami, Rosenstiel School of Marine Science, Contract No. 7701 617573 for Florida Marine Research Institute, St. Petersburg, FL. 45 p.

Baldwin, R., G.R. Hughes, and R.I.T. Prince. 2003. Loggerhead turtles in the Indian Ocean. Pages 218-232 in Bolten, A.B. and B.E. Witherington (editors). Loggerhead Sea Turtles. Smithsonian Books, Washington D.C.

Baker, J.D., C.L. Littnan, and D.W. Johnston. 2006. Potential effects of sea level rise on the terrestrial habitats of endangered and endemic megafauna on the Northwestern Hawaiian Islands. Endangered Species Research 2:21-30.

Barnette, M., Personal Communication. NOAA, NMFS, SERO, 263 13th Avenue South St. Petersburg, Florida 33701.

Barnette, M. C. 2001. A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat. NOAA Tech. Memo. NMFS-SEFSC-449. National Marine Fisheries Service, 263 13th Avenue, South St. Petersburg, Florida 33701. 62 pp.

Bell, K. 2009. Fish House/Retail/Restaurant owner, personal communication.

Bjorndal, K.A., A.B. Bolten, and H.R. Martins. 2000. Somatic growth model of juvenile loggerhead sea turtles *Caretta caretta*: duration of pelagic stage. Marine Ecology Progress Series 202:265-272.

Bolten, A.B., K.A. Bjorndal, and H.R. Martins. 1994. Life history model for the loggerhead sea turtle (*Caretta caretta*) populations in the Atlantic: Potential impacts of a longline fishery. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-SWFSC-201. p.48-55.

Bolten, A.B. 2003. Active swimmers - passive drifters: the oceanic juvenile stage of loggerheads in the Atlantic system. Pages 63-78 in Bolten, A.B. and B.E. Witherington (editors). Loggerhead Sea Turtles. Smithsonian Books, Washington D.C.

Braun-McNeill, J., and S. Epperly. 2002. Spatial and Temporal Distribution of Sea Turtles in the Western North Atlantic and the U.S. Gulf from Marine Recreational Fishery Statistics Survey (MRFSS). Marine Fisheries Review 64(4):50-56.

Brooks, G. 2008-2009. Commercial fisherman, personal communication.

Byrd, J., S. Murphy, and A. Von Harten. 2005. Morphometric analysis of the northern subpopulation of Caretta caretta in South Carolina, USA. Marine Turtle Newsletter 107:1-4.

Caldwell, D.K. 1962. Comments on the nesting behavior of Atlantic loggerhead sea turtles, based primarily on tagging returns. Quarterly Journal of the Florida Academy of Sciences 25(4):287-302.

Cass-Calay, S. L. and M. Bahnick. 2002. Status of the yellowedge grouper fishery in the Gulf. NOAA, NMFS, SEFSC, 75 Virginia Beach Drive, Miami, Florida 33149. Contribution SFD 02/03 – 172. 67 p.

CEQ (Council on Environmental Quality). Accessed on October 1, 2009.
Website - http://www.nepa.gov/nepa/regs/ceq/toc_ceq.htm
Home page - http://www.nepa.gov/nepa/nepanet.htm

Dahlen, M.K., R. Bell, J.I. Richardson, and T.H. Richardson. 2000. Beyond D-0004: Thirtyfour years of loggerhead (*Caretta caretta*) research on Little Cumberland Island, Georgia, 1964-1997. Pages 60-62 i*n* Abreu-Grobois, F.A., R. Briseno-Duenas, R. Marquez, and L. Sarti (compilers). Proceedings of the Eighteenth International Sea Turtle Symposium. NOAA Technical Memorandum NMFS-SEFSC-436.

Daniels, R.C., T.W. White, and K.K. Chapman. 1993. Sea-level rise: destruction of threatened and endangered species habitat in South Carolina. Environmental Management 17(3):373-385.

Davis, R. W., W. E. Evans, and B. Wursig (editors) 2000. Cetaceans, Sea Turtles, and Seabirds in the Northern Gulf of Mexico: Distribution, Abundance, and Habitat Associations. Volume II: Technical Report. U. S.Geological Survey Biological Resources Division USGS/BRD/CR-1999-0006, OCS Study MMS 2000-003.

Dodd, C.K., Jr. 1988. Synopsis of the biological data on the loggerhead sea turtle *Caretta caretta* (Linnaeus 1758). U.S. Fish and Wildlife Service, Biological Report 88(14). 110 pages.

Dodd, M.G. and A.H. Mackinnon. 1999. Loggerhead turtle (*Caretta caretta*) nesting in Georgia, 1999: implications for management. Georgia Department of Natural Resources unpublished report. 41 pages.

Dodd, M.G. and A.H. Mackinnon. 2000. Loggerhead turtle (*Caretta caretta*) nesting in Georgia, 2000: implications for management. Georgia Department of Natural Resources unpublished report. 47 pages.

Dodd, M.G. and A.H. Mackinnon. 2001. Loggerhead turtle (*Caretta caretta*) nesting in Georgia, 2001. Georgia Department of Natural Resources unpublished report submitted to the U.S. Fish and Wildlife Service for grant E-5-1 "Coastal Endangered Species Management." 46 pages.

Dodd, M.G. and A.H. Mackinnon. 2002. Loggerhead turtle (*Caretta caretta*) nesting in Georgia, 2002. Georgia Department of Natural Resources unpublished report submitted to the U.S. Fish and Wildlife Service for grant E-5-2 "Coastal Endangered Species Management." 46 pages.

Dodd, M.G. and A.H. Mackinnon. 2003. Loggerhead turtle (*Caretta caretta*) nesting in Georgia, 2003. Georgia Department of Natural Resources unpublished report submitted to the U.S. Fish and Wildlife Service for grant E-5-3 "Coastal Endangered Species Management." 46 pages.

Dow, W., K. Eckert, M. Palmer, and P. Kramer. 2007. An atlas of sea turtle nesting habitat for the Wider Caribbean Region. The Wider Caribbean Sea Turtle Conservation Network and The Nature Conservancy. WIDECAST Technical Report No. 6. Beaufort, North Carolina. 267 pages.

Ehrhart, L.M. 1980. A continuation of base-line studies for environmentally monitoring space transportation systems (STS) at John F. Kennedy Space Center. Volume 4: threatened and endangered species of the Kennedy Space Center. Part 1: marine turtle studies. Final report to NASA, 1976-1979. 417 pages.

Ehrhart, L.M. 1989. Status report of the loggerhead turtle. Pages 122-139 *in* Ogren, L., F. Berry, K. Bjorndal, H. Kumpf, R. Mast, G. Medina, H. Reichart, and R. Witham (editors). Proceedings of the 2nd Western Atlantic Turtle Symposium. NOAA Technical Memorandum NMFS-SEFC-226.

Ehrhart, L.M., D.A. Bagley, and W.E. Redfoot. 2003. Loggerhead turtles in the Atlantic Ocean: geographic distribution, abundance, and population status. Pages 157-174 *in* Bolten, A.B. and B.E. Witherington (editors). Loggerhead Sea Turtles. Smithsonian Books, Washington D.C.

Eklund, A. M. 1994. (editor) Status of the stocks of Nassau grouper, *Epinephelus striatus*, and jewfish, *E. itajara*- Final Report. NOAA, NMFS, SEFSC, 75 Virginia Beach Drive, Miami, Florida 33149. Contrib. No. MIA-94/95-15. 170 p.

EPA (Environmental Protection Agency). www.epa.gov/climatechange/index.html.

Florida Fish and Wildlife Conservation Commission (FWC). 2008. 2008 Nest Survey Results Do Not Change Turtle Nesting Trends.
http://research.myfwc.com/features/view_article.asp?id=27537

Fish, M.R., I.M. Cote, J.A. Gill, A.P. Jones, S. Renshoff, and A.R. Watkinson. 2005. Predicting the impact of sea-level rise on Caribbean sea turtle habitat. Conservation Biology 19:482-491.

FISH Preserve. http://fishnews.org/preserve/

Foley, A. 2002. Investigation of Unusual Mortality Events in Florida Marine Turtles. A Final Report Submitted to the NMFS. December 16.

Foley, A., B. Schroeder, and S. MacPherson. In press. Post-nesting migrations and resident areas of Florida loggerheads. In Proceedings of the Twenty-fifth Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum

Frazer, N.B. and J.I. Richardson. 1985. Annual variation in clutch size and frequency for loggerhead turtles, *Caretta-caretta*, nesting at Little Cumberland Island, Georgia, USA. Herpetologica 41(3):246-251.

Fritts, T. H., W. Hoffman, and M. A. McGehee. 1983. The distribution and abundance of marine turtles in the Gulf of Mexico and nearby Atlantic waters. Journal of Herpetology 17(4):327–344.

FWC. 2008. Letter to Crabtree, R., Dated Dec. 9, 2009. GMFMC Log File Number 5767.

GMFMC. 1981. Fishery management plan for the reef fish fishery of the Gulf of Mexico and environmental impact statement. Gulf of Mexico Fishery Management Council, Tampa, Florida.

GMFMC. 1989. Amendment 1 to the reef fish fishery management plan. Gulf of Mexico Fishery Management Council, Tampa, Florida. 356 p.

GMFMC. 1991. Amendment 3 to the Reef Fish Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, Tampa, Florida. 17 p. with appendices.

GMFMC. 1998. Generic Amendment for Addressing Essential Fish Habitat Requirements in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery of the Gulf of Mexico, United States Waters, Red Drum Fishery of the Gulf of Mexico, Reef Fish Fishery of the Gulf of Mexico, Coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico and South Atlantic Stone Crab Fishery of the Gulf of Mexico, Spiny Lobster in the Gulf of Mexico and South Atlantic, Coral and Coral Reefs of the Gulf of Mexico. (Includes Environmental Assessment)

GMFMC. 2003. Amendment 21 to the reef fish fishery management plan. Gulf of Mexico Fishery Management Council, Tampa, Florida. 215 p.

GMFMC. 2004a. Final Environmental Impact Statement for the Generic Essential Fish Habitat Amendment to the following fishery management plans of the Gulf of Mexico: Shrimp Fishery of the Gulf of Mexico, Red Drum Fishery of the Gulf of Mexico, Reef Fish Fishery of the Gulf of Mexico, Stone Crab Fishery of the Gulf of Mexico, Coral and Coral Reef Fishery of the Gulf of Mexico, Spiny Lobster Fishery of the Gulf of Mexico and South Atlantic, Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. Gulf of Mexico Fishery Management Council, Tampa, Florida. 118 p.

GMFMC. 2004b. Final Amendment 23 to the Reef Fish Fishery Management Plan to set vermilion snapper Sustainable Fisheries Act targets and thresholds and to establish a plan to end overfishing and rebuild the stock. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607. 202 p.

GMFMC. 2005a. Generic Amendment 3 for addressing EFH requirements, HAPCs , and adverse effects of fishing in the following FMPs of the Gulf of Mexico: Shrimp, Red Drum, Reef Fish, Stone Crab, Coral and Coral Reefs in the GOM and Spiny Lobster and the Coastal Migratory Pelagic resources of the GOM and South Atlantic. Gulf of Mexico Fishery Management Council, Tampa, Florida.

GMFMC. 2005b. Amendment 25 to the FMPs for: Reef Fish and Coastal Migratory Pelagics Amendment 17 for Extending the Charter Vessel/Headboat Permit Moratorium (Including SEIS/RIR/IRFA) Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607. 79 pp with appendices

GMFMC. 2005c. Final Regulatory Amendment to the Reef Fish Fishery Management Plan to Set Recreational Management Measures for Grouper Starting in 2006. Gulf of Mexico Fishery Management Council, Tampa, Florida. 124 p.

GMFMC. 2005d. Amendment 18A to the Reef Fish FMP for resolving enforcement of regulations, for updating the framework procedure for setting total allowable catch, and to reduce bycatch mortality of incidentally caught endangered sea turtles and smalltooth sawfish. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607. 192 pp with appendices

GMFMC. 2006. Amendment 26 to the Gulf of Mexico Reef Fish Fishery Management Plan to establish a red snapper individual fishing quota program. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607.

GMFMC. 2007. Amendment 27 to the Reef Fish FMP and Amendment 14 to the Shrimp FMP to end overfishing and rebuild the red snapper stock. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607. 490 pp with appendices

GMFMC. 2008a. Reef Fish Amendment 30B: Gag – End Overfishing and Set Management Thresholds and Targets; Red Grouper – Set Optimum Yield, Total Allowable Catch, and Management Measures; Area Closures; and Federal Regulatory Compliance. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607. 433 p.

GMFMC. 2008b. Reef Fish Amendment 30A: Greater Amberjack – revise rebuilding plan, accountability measures; Gray Triggerfish – establish rebuilding plan, end overfishing, accountability measures, regional management, management thresholds and benchmarks. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607. 328 p.

GMFMC. 2009. Amendment 29 to the Reef Fish FMP: Effort Management in the Commercial Grouper and Tilefish Fisheries. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607. 300 pp with appendices

GMFMC and SAFMC. 1982. Fishery Management Plan, Environmental Impact Statement, and Regulatory Impact Review for Spiny Lobster in the Gulf of Mexico and South Atlantic. March. Gulf of Mexico Fishery Management Council, Lincoln Center, Suite 331, 5401 West Kennedy Boulevard, Tampa, Florida 33609. South Atlantic Council, Southpark Building, Suite 306, 1 Southpark Circle, Charleston, South Carolina 29407-4699.

Grimes, C.B., K.W. Able, and S.C. Turner. 1982. Direct observation from a submersible vessel of commercial longlines for tilefish. Transactions of the American Fisheries Society 111:94-98.

Hamilton, A. N., Jr. 2000. Gear impacts on essential fish habitat in the Southeastern Region. NOAA, NMFS, SEFSC, 3209 Frederick Street, Pascagoula, Mississippi 39567. 45 pp.

Hawkes, L.A., A.C. Broderick, M.H. Godfrey, and B.J. Godley. 2005. Status of nesting loggerhead turtles *Caretta caretta* at Bald Head Island (North Carolina, USA) after 24 years of intensive monitoring and conservation. Oryx 39(1):65-72.

Hawkes, L.A., A.C. Broderick, M.S. Coyne, M.H. Godfrey, and B.J. Godley. 2007. Only some like it hot -- quantifying the environmental niche of the loggerhead sea turtle. Diversity and Distributions 13:447-457.

Hawkes, L.A., A.C. Broderick, M.H. Godfrey, and B.J. Godley. 2007. Investigating the potential impacts of climate change on a marine turtle population. Global Change Biology 13:923-932.

Hedges, M.E. 2007. Development and application of a multistate model to the northern subpopulation of loggerhead sea turtles (*Caretta caretta*). Unpublished Master of Science thesis. Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 144 pages.

Heppell, S.S., L.B. Crowder, D.T. Crouse, S.P. Epperly and N.B. Frazer. 2003. Population models for the Atlantic loggerhead. Pages 255–274 *in*: A.B. Bolten and B.E. Witherington, editors, Loggerhead Sea Turtles, Smithsonian Institution Press, Washington.

Holiman, S. G. 1999. Economic summary of the Gulf of Mexico reef fish recreational fishery. October. SERO-ECON-00-02

Holiman, S. G. 2000. Summary report of the methods and descriptive statistics for the 1997-98 southeast region marine recreational economics survey. April. SERP-ECON-00-11.

Impact Assessment, Inc. 2005. Identifying Communities Associated with the Fishing Industry Along the Florida Gulf Coast. Impact Assessment, Inc. La Jolla, CA. Volumes 1-3
646 pp.

Ingram, W. and T. Henwood. 2009. Catch rates and distribution of loggerhead sea turtles, *Caretta caretta*, collected during NOAA fisheries bottom longline surveys from the eastern U.S. Gulf of Mexico. NOAA Fisheries, Southeast Fisheries Science Center, Mississippi Laboratories, Pascagoula, Mississippi 39567. 13 pp.

IPCC (Intergovernmental Panel on Climate Change). 2007. Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Quin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (editors)] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Kamezaki, N., Y. Matsuzawa, O. Abe, H. Asakawa, T. Fujii, K. Goto, S. Hagino, M. Hayami, M. Ishii, T. Iwamoto, T. Kamata, H. Kato, J. Kodama, Y. Kondo, I. Miyawaki, K. Mizobuchi, Y. Nakamura, Y. Nakashima, H. Naruse, K. Omuta, M. Samejima, H. Suganuma, H. Takeshita, T. Tanaka, T. Toji, M. Uematsu, A. Yamamoto, T. Yamato, and I. Wakabayashi. 2003. Loggerhead turtles nesting in Japan. Pages 210-217 in Bolten, A.B. and B.E. Witherington (editors). Loggerhead Sea Turtles. Smithsonian Books, Washington D.C.

Kiyota, M., K. Yokota, T. Nobetsu, H. Minami, and H. Nakano. 2004. Assessment of mitigation measures to reduce interactions between sea turtles and longline fishery. Proceedings International Symposium SEASTAR2000 Bio-logging Science 2004: 24-29.

Legault, C.M., and A.M. Eklund. 1998. Generation times for Nassau grouper and jewfish with comments on M/K ratios. Sustainable Fisheries Division Contribution SFD-97/98-10A. Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, Florida 33149.

Limpus, C.J. and D.J. Limpus. 2003. Loggerhead turtles in the equatorial and southern Pacific Ocean: a species in decline. Pages 199-209 in Bolten, A.B. and B.E. Witherington (editors). Loggerhead Sea Turtles. Smithsonian Books, Washington D.C.

Lohmann, K. J., Hester, J. T., and C. M. F. Lohmann. 1999. Long-distance navigation in sea turtles. Ethology, Ecology, and Evolution. 11: 1-23.

Lohmann, K. J., and Lohmann, C. M. F. 1996. Detection of magnetic field intensity by sea turtles. Nature. 380: 59-61.

Lohmann, K. J., and Lohmann, C. M. F. 1994. Journal of Experimental Biology 190: 1-8.

Lohoefener, R. R., W. Hoggard, C. L. Roden, K. D. Mullin, and C. M. Rogers. 1988. Distribution and relative abundance of surfaced sea turtles in the north-central Gulf of Mexico: spring and fall 1987. Pages 47–50 *in* B. A. Schroeder editor, Proceedings of the Eighth Annual Workshop on Sea Turtle Conservation and Biology, U.S. Department of Commerce, NOAA Tech. Memo. NMFS-SEFC-202.

Lucas, L. 2001. Fishery Management and Local Communities: the case of Madeira Beach, Florida. Marine Fisheries Review 63(4):32-42.

Lutcavage, M.E., and P.L. Lutz. 1997. Diving Physiology. Pages 277-291 *in* P.L. Lutz and J.A. Musick, editors. The Biology of Sea Turtles. CRC Press, Washington, D.C.

Manatee Economic Development Council. 2009. Accessed on October 1, 2009. http://www.manateeedc.com/

Margaritoulis, D., R. Argano, I. Baran, F. Bentivegna, M.N. Bradai, J.A. Camiñas, P. Casale, G. De Metrio, A. Demetropoulos, G. Gerosa, B.J. Godley, D.A. Haddoud, J. Houghton, L. Laurent, and B. Lazar. 2003. Loggerhead turtles in the Mediterranean Sea: present knowledge and conservation perspectives. Pages 175-198 in Bolten, A.B. and B.E. Witherington (editors). Loggerhead Sea Turtles. Smithsonian Books, Washington D.C.

Meylan, A.B. 1999. The status of the hawksbill turtle (*Eretmochelys imbricata*) in the Caribbean region. Chelonian Conservation and Biology 3(2):177-184.

Milton, S.L., S. Leone-Kabler, A.A. Schulman, and P.L. Lutz. 1994. Effects of Hurricane Andrew on the sea turtle nesting beaches of South Florida. Bulletin of Marine Science 54(3):974-981.

Moncada Gavilán, F. 2001. Status and distribution of the loggerhead turtle, *Caretta caretta*, in the Wider Caribbean Region. Pages 36-40 in Eckert, K.L. and F.A. Abreu Grobois (editors). Proceedings of the Regional Meeting: "Marine Turtle Conservation in the Wider Caribbean Region: a Dialogue for Effective Regional Management." Santo Domingo, 16-18 November 1999. WIDECAST, IUCN-MTSG, WWF, and UNEP-CEP.

Muller, R. G., M. D. Murphy, J. de Silva, and L. R. Barbieri. 2003. Final Report Submitted to the National Marine Fisheries Service, the Gulf of Mexico Fishery Management Council, and the South Atlantic Fishery Management Council as part of the Southeast Data, Assessment, and Review (SEDAR) III. Florida Fish and Wildlife Conservation Commission, FWC-FMRI Report: IHR 2003-10. Florida Fish and Wildlife Research Institute, St. Petersburg, Florida. 217 p. + 2 appendices.

Mrosovsky, N. 1988. Pivotal temperatures for loggerhead turtles from northern and southern nesting beaches. Canadian Journal of Zoology 66:661-669.

Murphy, T.M. and S.R. Hopkins. 1984. Aerial and ground surveys of marine turtle nesting beaches in the southeast region. Unpublished report prepared for the National Marine Fisheries Service.

Nance, J. M. Personal Communication. NOAA, NMFS, SEFSC, 4700 Avenue U, Galveston, Texas 77551.

NMFS. 1984. Recovery plan for marine turtles. National Marine Fisheries Service, St. Petersburg, Florida.

NMFS. 2001. Biological Opinion. Gulf of Mexico Outer Continental Shelf Lease Sale 181. NMFS, SERO, St. Petersburg, FL. (F/SER/2000/01298).

NMFS. 2002. Status of red grouper in United States waters of the Gulf of Mexico during 1986-2001, revised. NOAA, NMFS, SEFSC, 75 Virginia Beach Drive, Miami, Florida 33149. Contribution No. SFD-01/02-175rev. 65 p.

NMFS. 2005. Endangered Species Act – Section 7 consultation on the continued authorization of reef fish fishing under the Gulf of Mexico Reef Fish Fishery Management Plan and Proposed Amendment 23. Biological Opinion, February 15. 115 p. plus appendices.

NMFS. 2006a. Final MARFIN report for industry based observer program for the reef fish fishery in the Gulf of Mexico. NA05NMF4331069.

NMFS. 2006b. Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. Public Document. pp. 1600

NMFS. 2007. Fisheries of the United States 2006. NMFS, Silver Spring, MD. 104 p. Status of US Fisheries. Accessed on October 1, 2009.
http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm

NMFS. 2008. Report of the U.S. longline bycatch reduction assessment and planning workshop. Seattle, Washington September 2007. NOAA Technical Memorandum NMFS-OPR-41. 42 p.

NMFS. 2009a. Grouper Fishery Trends in the Gulf of Mexico, 2004-2008. SERO-LAPP-2009-01. 71 pp.

NMFS. 2009b. Summary of Winter and Summer Eastern Gulf of Mexico Aerial Survey Data for Loggerhead Turtle Distribution (UPDATE: Data summary restricted to areas east of -85.50 degrees longitude). NMFS Southeast Fisheries Science Center Contribution, 25 February 2009. 7 p.

NMFS. In prep. Distribution of sea turtles in the eastern Gulf of Mexico. NMFS National Observer Program Webpage - http://www.st.nmfs.noaa.gov/st4/nop/index.html).

NMFS. 2009c. Cumulative effects of Amendment 31 regulations upon effective effort impacting sea turtle takes in the Gulf of Mexico reef fish bottom longline fishery. 23 p.

NMFS. 2009d. Environmental Assessment and Regulatory Impact Review for an Emergency Rule to Reduce Sea Turtle Bycatch by the Eastern Gulf of Mexico Reef Fish Bottom Longline Fishery. National Marine Fisheries Service, Southeast Regional Office, 263 13th Avenue South, St. Petersburg, FL 33701-5505. 95 p.

NMFS. 2009e. Memo: Bottom Longline Effort Analysis. National Marine Fisheries Service, Southeast Regional Office, 263 13th Avenue South, St. Petersburg, FL 33701-5505.

NMFS. 2009f. Endangered Species Act section 7 consultation on the continued authorization of reef fish fishing under the Gulf of Mexico (Gulf) Reef Fish Fishery Management Plan (RFFMP. Biological Opinion, Month, day.

NMFS-SEFSC (Southeast Fisheries Science Center). 2008. Estimated takes of sea turtles in the bottom longline portion of the Gulf of Mexico reef fish fishery July 2006 through 2007 based on observer data. NMFS Southeast Fisheries Science Center Contribution PRD-07/08-15. 19 p. plus appendices

NMFS-SEFSC. 2009. Estimated takes of sea turtles in the bottom longline portion of the Gulf of Mexico reef fish fishery July 2006 through December 2008 based on observer data. NMFS Southeast Fisheries Science Center Contribution PRD-07/09-07. 23 p. plus appendices.

NMFS and U.S. Fish and Wildlife Service (USFWS). 2007a. Green sea turtle (*Chelonia mydas*) 5-year review: Summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 102 pp.

NMFS and USFWS. 2007b. Hawksbill sea turtle (*Eretmochelys imbricata*) 5-year review: Summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 90 pp.

NMFS and USFWS. 2007c. Kemp's ridley sea turtle (*Lepidochelys kempii*) 5-year review: Summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 50 pp.

NMFS and USFWS. 2007d. Leatherback sea turtle (*Dermochelys coriacea*) 5-year review: Summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 79 pp.

NMFS and USFWS. 2007e. Loggerhead sea turtle (*Caretta caretta*) 5-year review: Summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 65 pp

NMFS and USFWS. 2008. Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*), Second Revision. National Marine Fisheries Service, Silver Spring, MD. Accessed on October 1, 2009. http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_loggerhead_atlantic.pdf

NOAA. Spatial Patterns of Socioeconomic Data 1970 to 2000. Accessed on October 1, 2009. http://marineeconomics.noaa.gov

NOAA. 2007. National Hurricane Center Hurricane Archive. Accessed on October 1, 2009. http://www.nhc.noaa.gov/pastall.shtml

North Carolina Sea Grant. 2007. Waterfront Access Study Committee Final Report. UNC-SG-07-03.

NRC (National Research Council). 1990. Decline of the Sea Turtles, Causes and Prevention. Natl. Acad. Press. Washington, D. C. 259 pp.

Olsen, D. A., A. E. Dammann, and D. Neal. 1974. A vertical longline for red snapper fishing. Marine Fisheries Review 36:7-9.

Paffe, H. 2009. EDF, personal communication.

Pike, D.A., R.L. Antworth, and J.C. Stiner. 2006. Earlier nesting contributes to shorter nesting seasons for the Loggerhead sea turtle, *Caretta caretta*. Journal of Herpetology, 40(1):91-94.

PIRO Webpage - http://www.fpir.noaa.gov/OBS/obs_hawaii.html

Plotkin, P.T. and J.R. Spotila. 2002. Post-nesting migrations of loggerhead turtles *Caretta caretta* from Georgia, USA: conservation implications for a genetically distinct subpopulation. Oryx 36(4):396-399.

Plotkin, P.T., M.K. Wicksten, A.F. Amos. 1993. Feeding ecology of the loggerhead sea turtle *Caretta caretta* in the northwestern Gulf of Mexico. Marine Biology 115:1-15.

Porch, C. E., A. M. Eklund and G. P. Scott. 2003. An assessment of rebuilding times for goliath grouper. NOAA, NMFS, SEFSC, 75 Virginia Beach Drive, Miami, Florida 33149. Contribution: SFD 2003-0018. 25 p.

Porch, C. E., and S. L. Cass-Calay. 2001. Status of the vermilion snapper fishery in the Gulf of Mexico. Assessment 5.0. NOAA, NMFS, SEFSC, 75 Virginia Beach Drive, Miami, Florida 33149. Contribution: SFD-01/02-129. 42 p.

Pria, M.J., H. McElderry, M. Dyas, and P. Wesley. 2008. Using electronic monitoring to estimate reef fish catch on bottom longline vessels in the Gulf of Mexico: A pilot study. Archipelago Marine Research Ltd. 525 Head Street, Victoria, BC Canada. 42 p.

Renaud, M.L., and J.A. Carpenter. 1994. Movements and submergence patterns of loggerhead turtles (*Caretta caretta*) in the Gulf of Mexico determined through satellite telemetry. Bulletin of Marine Science 55:1-15.

Richards, P. M. 2007. Estimated takes of protected species in the commercial directed shark bottom longline fishery 2003, 2004, and 2005. NMFS Southeast Fisheries Science Center Contribution PRD-06/07-08, June 2007, 21 p. Accessed on October 1, 2009. www.sefsc.noaa.gov/seaturtlesprogram.jsp

Richardson, T.H., J.I. Richardson, C. Ruckdeschel, and M.W. Dix. 1978. Remigration patterns of loggerhead sea turtles (*Caretta caretta*) nesting on Little Cumberland Island and Cumberland Island, Georgia. Pages 39-44 *in* Henderson, G.E. (editor). Proceedings of the Florida and Interregional Conference on Sea Turtles. Florida Marine Research Publications Number 33.

Richardson, L. R. and J. R. Gold. Jan. 1997. Mitochondrial DNA diversity in and population structure of red grouper, *Epinephelus morio*, from the Gulf of Mexico. Fishery Bulletin 95(1):174-178.

Ross, J.P. 1982. Historical decline of loggerhead, ridley, and leatherback sea turtles. Pages 189-195 in Bjorndal, K.A. (editor). Biology and Conservation of Sea Turtles. Smithsonian Institution Press, Washington, D.C.

Schroeder, B.A., A.M. Foley, and D.A. Bagley. 2003. Nesting patterns, reproductive migrations, and adult foraging areas of loggerhead turtles. Pages 114-124 in Bolten, A.B. and B.E. Witherington (editors). Loggerhead Sea Turtles. Smithsonian Books, Washington D.C.

Schroeder et al. In prep. Post-nesting migrations and resident areas of Florida loggerheads.

Scott, J.A. 2006. Use of satellite telemetry to determine ecology and management of loggerhead turtle (*Caretta caretta*) during the nesting season in Georgia. Unpublished Master of Science thesis. University of Georgia, Athens, Georgia. 165 pages.

Scott-Denton, E., NMFS Galveston Lab. Personal correspondence.

SEA (Strategic Environmental Assessment Division, NOS). 1998. Product overview: Products and services for the identification of essential fish habitat in the Gulf of Mexico. NOS, Silver Spring, Maryland; NOAA Fisheries, Galveston, Texas; and GMFMC, Tampa, Florida (available at http//biogeo.nos.noaa.gov/ projects/efh/gom-efh/)

Sea Turtle Stranding and Salvage Network. 2008. Southeast Fisheries Science Center. Accessed on October 1, 2009. www.sefsc.noaa.gov/seaturtleSTSSN.jsp

SEDAR 3. 2003. Complete Stock Assessment Report of Yellowtail Snapper in the Southeastern United States. SEDAR (http://www.sefsc.noaa.gov/sedar/), Charleston, South Carolina. 18 p.

SEDAR 6. 2004a. The hogfish in Florida: Assessment review and advisory report. SEDAR (http://www.sefsc.noaa.gov/sedar/), Charleston, South Carolina. 12 p.

SEDAR 6. 2004b. The goliath grouper in southern Florida: Assessment review and advisory report. SEDAR (http://www.sefsc.noaa.gov/sedar/), Charleston, South Carolina. 15 p.

SEDAR 7. 2005. Stock assessment report of SEDAR 7 Gulf of Mexico Red Snapper. SEDAR (http://www.sefsc.noaa.gov/sedar/), Charleston, South Carolina. 480 p.

SEDAR 9. 2006a. SEDAR 9 Gulf of Mexico vermilion snapper assessment report 3. SEDAR (http://www.sefsc.noaa.gov/sedar/), Charleston, South Carolina. 231 p.

SEDAR 9. 2006b. Stock assessment report of SEDAR 9: Gulf of Mexico gray triggerfish. Southeast Data, Assessment, and Review, Charleston, South Carolina. 195 p.

SEDAR 9. 2006c. Stock assessment report of SEDAR 9: Gulf of Mexico greater amberjack. Southeast Data, Assessment, and Review, Charleston, South Carolina. 178 p.

SEDAR 10. 2006. SEDAR 10-Complete Stock Assessment Report 1: Gulf of Mexico gag grouper. SEDAR (http://www.sefsc.noaa.gov/sedar/), Charleston, South Carolina.

SEDAR 12. 2007 SEDAR12-Complete Stock Assessment Report 1: Gulf of Mexico red grouper. SEDAR (http://www.sefsc.noaa.gov/sedar/), Charleston, South Carolina.

SEDAR 2009. SEDAR Update Assessment: Stock Assessment of Red Grouper in the Gulf of Mexico, Miami, Florida.

Shah, A., J.W. Watson, D.G. Foster, S. Epperly. 2004 Experiments in the western Atlantic Northeast Distant Waters to evaluate sea turtle mitigation measures in the pelagic longline fishery. Report on experiments conducted in 2001 -2003. March 3, 2004, 46 p. http://www.sefsc.noaa.gov/seaturtleunpublishedreports.jsp#F

Smith, G. B., H. M. Austin, S. A. Bortone, R. W. Hastings, and L. H. Ogren. 1975. Fishes of the Florida Middle Ground with comments on ecology and zoogeography. Fla. Mar. Res. Publ. No. 9:1-14

Spaeth, B. 2008-2009. Commercial fisherman, personal communication.

Spotila, J.R. 2004. Sea turtles a complete guide to their biology, behavior, and conservation, Johns Hopkins University Press, Baltimore, Maryland.

Stan Mayfield Working Waterfronts Florida Forever Program. 2009. Accessed on October 1, 2009. http://www.floridacommunitiestrust.org/mayfieldwaterfronts/

Stokes, L., D. Hataway, S. Epperly, L. Belskis, C. Bergmann, J. Watson, and B. Higgins. 2006. Evaluation of injury potential in incidentally captured loggerhead sea turtles (*Caretta caretta*) relating to hook size and baiting technique, p. 267. *In*: Frick, M. A. Panagopoulou, A.F. Rees, and K. Williams (compilers). 2006. Book of Abstracts, 26th Annual Symposium on Sea Turtle Biology and Conservation, Island of Crete, Greece, April 3-8, 2006, 376 pp. Accessed on October 1, 2009.
http://www.nmfs.noaa.gov/pr/pdfs/species/turtlesymposium2006_abstracts.pdf

TEWG (Turtle Expert Working Group). 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the western North Atlantic. NOAA Tech. Memo. NMFS-SEFSC-409. 115 p.

TEWG. 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the western North Atlantic. U.S. Department Commerce NOAA Technical Memorandum NMFS-SEFSC-444.

TEWG (Turtle Expert Working Group). 2007. An Assessment of the Leatherback Turtle Population in the Atlantic Ocean. NOAA Technical Memorandum, NMFS-SEFSC-555, 116p.

TEWG (Turtle Expert Working Group). 2009. An assessment of the loggerhead turtle population in the western North Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-575, 31p.
Trumble, R. 2009. MRAG Americas Inc., personal communication.

Tucker, A. D., Mote Marine Lab., Sarasota, FL, unpublished data.

Turner, S. C., N. J. Cummings, and C .P. Porch. 2000. Stock assessment of Gulf of Mexico greater amberjack using data through 1998. NOAA, NMFS, SEFSC, 75 Virginia Beach Drive, Miami, Florida 33149. SFD-99/00-100. 27 pp.

Turner, S.C. C.E. Porch, D. Heinemann, G.P. Scott and M. Ortiz. 2001. Status of Gag in the Gulf of Mexico, Assessment 3.0. NMFS, Southeast Fisheries Center, Miami Laboratory, Miami SFD-2000/2001-118

USFWS. 2000. Report on the Mexico/United States of America Population Restoration Project for the Kemp's Ridley Sea Turtle, *Lepidochelys kempii*, on the Coasts of Tamaulipas and Veracruz, Mexico.

U.S. Census Bureau. 2009. Accessed on October 1, 2009. http://www.census.gov/index.html

Valle, M., C.M. Legault, and M. Ortiz. 2001. A stock assessment for gray triggerfish, *Balistes capriscus*, in the Gulf of Mexico. NMFS/SEFSC, Miami Laboratory. Sustainable Fisheries Division Contribution SFD-00/01-124. 50 p. + app.

Walsh, C. F., and L. P. Garrison. 2006. Estimated bycatch of marine mammals and turtles in the U.S. Atlantic pelagic longline fleet during 2005. NOAA Technical Memorandum NMFS-SEFSC-539, 52 p.

Waters, D. 2008-2009. Commercial fisherman, personal communication

Waters, J. 2008. Southeast Fisheries Science Center, data analyst, personal communication.

Watson, J.W., S.P. Epperly, A.K. Shah, and D.G. Foster. 2005. Fishing methods to reduce sea turtle mortality associated with pelagic longlines. Canadian Journal of Aquatic Sciences 62:965-981.

Weishampel, J.F., D.A. Bagley, and L.M. Ehrhart. 2004. Earlier nesting by loggerhead sea turtles following sea surface warming. Global Change Biology, 10:1424-1427.

Wilson, D., B. J. McCay, D. Estler, M. Perez-Lugo, J. LaMarque, S. Seminski, and A. Tomczuk. 1998. Social and Cultural Impact Assessment of the Highly Migratory Species Fisheries Management Plan and the Amendment to the Atlantic Billfish Fisheries Management Plan.

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. pp. 175.

Witherington, B.E. 2002. Ecology of neonate loggerhead turtles inhabiting lines of downwelling near a Gulf Stream front. Marine Biology 140:843-853.

Witherington, B., P. Kubilis, B. Brost, and A. Meylan. 2009. Decreasing annual nest counts in a globally important loggerhead sea turtle population. Ecological Applications 19:30–54

Yokota, K., M. Kiyota, and H. Okamura. 2009. Effect of bait species and color on sea turtle bycatch and fish catch in a pelagic longline fishery. Fisheries Research 97:53-58.

Zurita, J.C., R. Herrera, A. Arenas, M.E. Torres, C. Calderón, L. Gómez, J.C. Alvarado, and R. Villavicencio. 2003. Nesting loggerhead and green sea turtles in Quintana Roo, Mexico. Pages 125-127 in Seminoff, J.A. (compiler). Proceedings of the Twenty-second Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFSC-503.

8.0 LIST OF PREPARERS

Name	Expertise	Responsibilities	Agency
Dr. Steve Branstetter	Biologist	FONSI/Review	SERO
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	Description of the Fishery, Economic Impact Analyses, Regulatory Impact Review, 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

9.0 LIST OF AGENCIES CONSULTED

NOAA Southeast Fishery Science Center

NOAA SERO Protected Resources Division

NOAA SER General Counsel

APPENDIX A – SEFSC Response to Analysis Requests from SERO Regarding an Interim Rule to Protect Loggerhead Sea Turtles from Bottom Longline Interactions

Larry Perruso

September 8, 2009

Interim Rule: Bottom Longline Gear Restrictions in the Gulf of Mexico Reef Fish Fishery

Alternative 1 – No Action. Allow the bottom longline emergency rule to expire October 28, 2009. This would allow bottom longline fishing for reef fish, subject to quota restrictions, east of 85°30'W (near Cape San Blas, FL) in waters greater than 20 fathoms and west of 85°30'W in waters greater than 50 fathoms.

Alternative 2 –. Terminate the reef fish bottom longline emergency rule and implement an interim rule regulating the use of bottom longline gear targeting reef fish east of 85°30'W (near Cape San Blas, FL). This rule would limit the number of hooks per vessel to a total of 1000 hooks of which no more than 750 can be rigged for fishing or fished at any given time. Additionally, this rule would prohibit the use of bottom longline gear targeting reef fish shoreward of a line approximating the 35 fathom depth contour.

Alternative 3 – Extend the bottom longline emergency rule for another 186 days. This would prohibit bottom longline fishing for reef fish east of 85°30'W (near Cape San Blas, Florida) in waters less than 50 fathoms unless the deepwater grouper and tilefish fisheries are closed, in which case the use of reef fish bottom longline gear would be prohibited in all waters east of 85°30'W. Reef fish bottom longline fishing would continue to be allowed west of 85°30'W in waters greater than 50 fathoms.

The interim rule considers various alternatives that address sea turtle interactions with bottom longline gear in lieu of the emergency rule, effective May 18, 2009, expiring on October 28, 2009. The interim rule incorporates the 35-fathom depth restriction that was selected by the Council for Amendment 31 and limits the number of hooks allowed on each vessel to 1,000, of which 750 may be rigged or fished. The hook restriction will be analyzed qualitatively.

Alternative 1 is the No Action alternative which allows the emergency rule to expire and the fishery to revert back to average conditions prior to May 18, 2009. Alternative 2 replaces the current emergency rule with new depth and hook restrictions that were selected by the Council as preferred alternatives in Amendment 31 while Alternative 3 extends the current emergency rule. Our analysis provides quantitative forecasts of revenues and net operating revenues for all three alternatives based on historical trips reported to the Federal Logbook Program during 2005-2008.

Setup – Alternative 1

To analyze Alternative 1, it is necessary to forecast the economic performance of the bottom longline (BLL) component in 2009 without any restrictions associated with turtle interactions.

The profile of trips used to simulate short-run BLL activity under the status quo met the following criteria:

- Longline gear produced a plurality of revenues on the trip.
- The plurality of revenues on the trip was produced by landings in statistical areas 1-8 (i.e., the eastern Gulf).
- Time period used: 2005-2008.
- At least one pound of reef fish species was landed.

From this profile we identified trips which the plurality of revenues was produced by shark landings and calculated the portion of "shark" trip revenues generated by reef fish landings. The economic loss associated with these trips was assumed to be the foregone reef fish revenue while the "shark" portion of the trip was assumed to proceed as normal.

We calculated average annual variable trip costs for each year based on a 20% stratified sample of all reported logbook trips. Variable trip costs include fuel, ice, bait, grocery and miscellaneous expenses. Labor expenses are not included. Total variable costs were calculated for each month during 2005-2008 by multiplying average variable trip costs by the number of trips in the trip profile for that month. Net operating revenues (NOR) were calculated for each month by subtracting aggregate variable costs from aggregate reef fish revenue. Finally, monthly and annual averages were calculated for the years 2005-2008. These results are reported in Table 1.

Table 1. Monthly Averages (2005-2008) of Status Quo (SQ) Effort (Trips), Ex-Vessel Revenue and NOR (millions, nominal dollars).

month	SQ BLL Trips	SQ Reef Rev.	SQ NOR
1	123.25	1.44	1.00
2	99.25	1.15	0.79
3	98.5	1.19	0.84
4	115	1.38	0.97
5	125	1.51	1.06
6	116.5	1.16	0.75
7	97.5	0.95	0.60
8	114	1.03	0.63
9	97	0.85	0.50
10	82.75	0.75	0.45
11	67	0.73	0.48
12	68.75	0.74	0.48
4-yr avg.	1,204.50	12.87	8.54

Setup – Alternatives 2 and 3

To analyze Alternatives 2 and 3, it is necessary to forecast the economic performance of the bottom longline (BLL) component in 2009 with depth restrictions to limit BLL interactions with sea turtles. The quantitative analysis examines the effects of establishing a restriction which does not allow longlining shoreward of the 35-fathom (Alternative 2) and 50-fathom (Alternative 3) depth contours (complete results in attached Excel files). The effects of restricting the number of hooks on BLL trips in Alternative 2 are assessed qualitatively.

The profile of trips used to simulate short-run BLL activity under depth restrictions met the following criteria:

- Longline gear produced a plurality of revenues on the trip.
- The plurality of revenues on the trip was produced by landings in statistical areas 1-8 (i.e. the eastern Gulf).
- Time period used: 2005-2008.
- At least one pound of reef fish species was landed.

From this profile we identified trips which the plurality of revenues was produced by shark landings and calculated the portion of "shark" trip revenues generated by reef fish landings. The economic loss associated with these trips was assumed to be the foregone reef fish revenue while the "shark" portion of the trip was assumed to proceed as normal.

In the Alternative 2 analysis historical trips were assigned to five "bins" based on regulated depth of 35 fathoms:

- All landings took place in depths greater than 35 fathoms (#1)
- All landings took place in depths less than or equal to 35 fathoms (#2)
- The majority (50% or more) of landings took place in depths greater than 35 fathoms with some landings in depths less than or equal to 35 fathoms (#3)
- The majority of landings took place in depths less than or equal to 35 fathoms with some landings in depths greater than 35 fathoms (#4)
- Trips where shark landings produced a plurality of revenues (#5)

Any trips that did not report depth information were classified into one of the bins based on the top revenue producing species group for that trip:

- Deep water groupers and tilefish were assigned to #1.
- Shallow water groupers and mid-depth snappers were assigned to #2.
- Sharks were assigned to #5.

Next, we determined the worst case industry loss scenario (i.e. no redistribution of longline effort into the vertical line sector or into deeper waters). Losses were calculated for each month and only apply to BLL effort displaced by the depth restrictions in the eastern Gulf.

- Bin 1 can be excluded from the displacement analysis since these trips are not affected by the depth restrictions (i.e., trips in waters deeper than 35 fathoms go on as usual).
- Tabulate the reef fish revenue produced in depths less than 35 fathoms during historical trips in bins 3 and 5.
    - Bin 3 – Deep water trips with a minority of landings in shallow waters
        - Industry loss equals the sum of revenues from all reef fish and shark landings caught in depths less than 35 fathoms. This assumes all landings were taken by BLL. The deep water portion of the trip is assumed to go on as usual.
    - Bin 5 – Trips in depths less than 35 fathoms where sharks produced a plurality of revenues
        - Industry loss equals the sum of revenues from all reef fish landings. The "shark" trip is assumed to continue as usual except all reef fish must be discarded.
- Estimate the NOR produced by trips in bins 2 and 4. These are the historical trips that would be displaced due to the depth restrictions, so the NOR represents industry loss due to the regulation. We assume that displaced longline effort is not redistributed to the vertical line sector or deeper waters.
    - Calculate NOR per trip by subtracting average variable trip costs excluding labor from historical trip revenues. Variable trip costs include fuel, ice, bait, groceries and miscellaneous expenses. Trip revenues are estimated using pounds landed reported to the Federal Logbook Program and average prices calculated from the Accumulated Landings Database. Average variable trip costs are estimated using all trips in a year using only bin #2. Also, the cost averages are based on a sample of trips from the logbook data base.
- For bins 2-5, sum the losses per trip for each month. For total industry loss, add these losses across bins. This is the total loss to ownership, captain and crew due to the displacement of trips in bins 2 and 4 as well as lost reef fish revenue from trips in bins 3 and 5.

The results of the worst case scenario analysis for Alternative 2 are presented in Table 2. Alternative 3 was likewise evaluated by repeating the methodology while imposing a 50-fathom depth restriction. The results of the worst case scenario analysis for Alternative 3 are presented in Table 3.

Table 2. Monthly Averages (2005-2008) of Worst Case Loss (WCL) of Effort (Trips), Ex-Vessel Revenue and NOR (millions, nominal dollars) in Response to a 35-Fathom Depth Restriction (Alternative 2).

month	BLL Trips Displaced in WCL	WCL Rev. Loss	WCL NOR Loss
1	64.25	(0.72)	(0.50)
2	47.25	(0.50)	(0.34)
3	39	(0.46)	(0.33)
4	70.25	(0.80)	(0.56)
5	64.75	(0.76)	(0.53)
6	77	(0.73)	(0.46)
7	73.75	(0.69)	(0.44)
8	85.25	(0.75)	(0.46)
9	68.75	(0.57)	(0.33)
10	59.5	(0.53)	(0.32)
11	38.25	(0.38)	(0.24)
12	49.5	(0.51)	(0.33)
4-yr avg.	737.5	(7.41)	(4.86)

Table 3. Monthly Averages (2005-2008) of Worst Case Loss (WCL) of Effort (Trips), Ex-Vessel Revenue and NOR (millions, nominal dollars) in Response to a 50-Fathom Depth Restriction (Alternative 3).

month	BLL Trips Displaced in WCL	WCL Rev. Loss	WCL NOR Loss
1	89.5	(1.06)	(0.75)
2	61.5	(0.71)	(0.50)
3	51.75	(0.64)	(0.46)
4	88	(1.02)	(0.72)
5	87.25	(1.01)	(0.70)
6	100.75	(0.99)	(0.64)
7	93.25	(0.92)	(0.59)
8	110.75	(0.99)	(0.60)
9	95.5	(0.83)	(0.49)
10	79	(0.71)	(0.42)
11	54.25	(0.59)	(0.38)
12	66.75	(0.72)	(0.47)
4-yr avg.	978.25	(10.19)	(6.73)

Lastly, we forecast additional industry revenues and NOR that would be generated by redistributing displaced longline effort into the vertical line sector due to the depth restrictions. The complete results for all gear switching scenarios are presented in the attached Excel files. Possible gear switching is a reasonable assumption for the 50-fathom depth restriction; however,

more vessels may decide to fish in deeper waters in response to the 35-fathom restriction. We still invoke the assumption of gear switching to analyze the economic gains associated with vessels moving to deeper waters due to the following reasons.

- Historical logbook data are not reported at the needed spatial resolution to provide reliable estimates of cost structures and CPUE in continuous depth contours.
- Gag grouper follow a non-uniform stock distribution which may result in disproportionate trip expenditures, especially fuel expenses when vessels travel to deeper waters to target gag.
- Vessels that do not normally fish outside of the 35-foot depth contour may significantly alter their fishing behavior (e.g. trip length) especially in light of the coinciding hook restrictions.
- Congestion may be a significant cost if enough vessels move to deeper waters. We have no way at this time of measuring the costs due to crowding externalities outside of 35-fathoms.

In summary, we feel that modeling fishing behavior in deeper waters introduces a number of uncertain factors that are distinguished by a high degree of uncertainty. We have opted to use the parsimonious gear switch model to proxy possible movement to deeper waters by the fleet. The upper bound of losses is the same regardless of the decision since no effort would switch into the vertical line sector (on one hand) or no vessels would fish in deeper waters (on the other). Furthermore, estimates of mean costs are much more robust for the gear decision as logbook data is linked directly to the discrete gear choice via the logbook form. The continuity of the depth contours precludes the same connectivity between logbook data and the spatial fishing decision.

APPENDIX B – CORRESPONDENCE FROM FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Florida Fish and Wildlife Conservation Commission

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Deputy Chief of Staff

Gil McRae
FWRI Director
(727) 896-8626
(727) 823-0166 FAX

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

Fish and Wildlife Research Institute
100 Eighth Avenue SE
St. Petersburg, Florida 33701-5020
Voice: (727) 896-8626
Fax: (727) 823-0166
Hearing/speech impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)
research.MyFWC.com

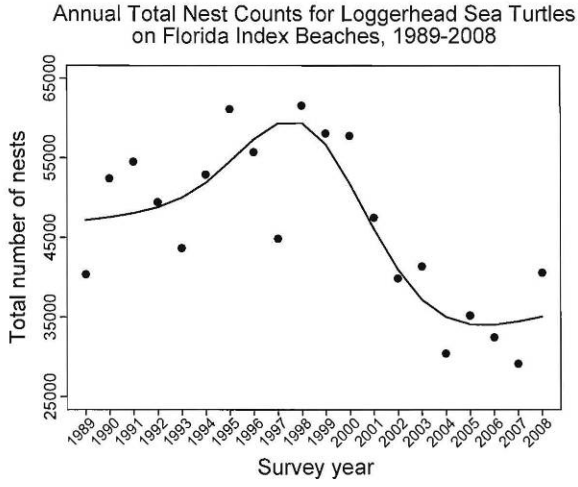
December 09, 2008

Richard Leard
Gulf of Mexico Fishery Management Council
2303 N. Lois Avenue, Suite 1100
Tampa, FL 33607

Dear Mr. Leard:

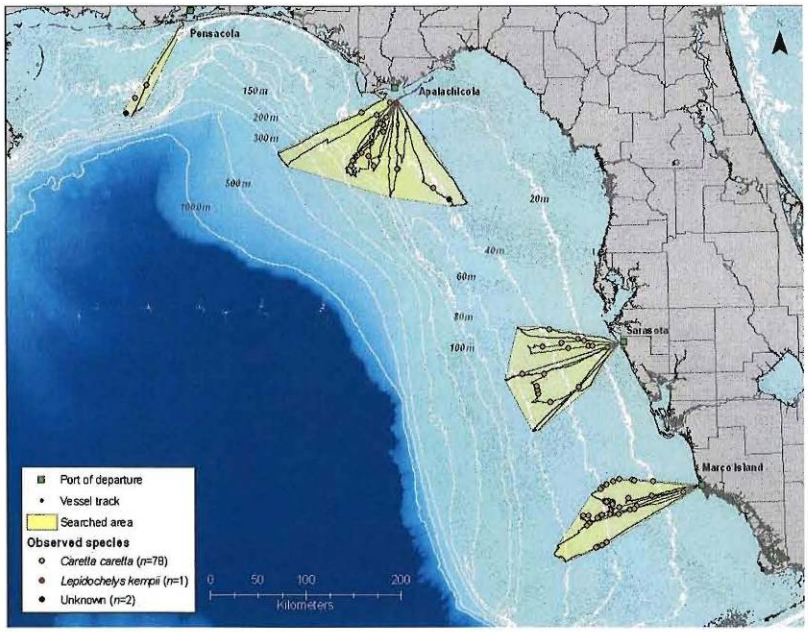
I am writing in response to the Notice of Intent by NMFS to prepare a draft environmental impact statement regarding management alternatives to reduce bycatch of sea turtles in the bottom longline component of the Gulf of Mexico reef fish fishery (Federal Register Vol. 73, No. 228 (25 November 2008), 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

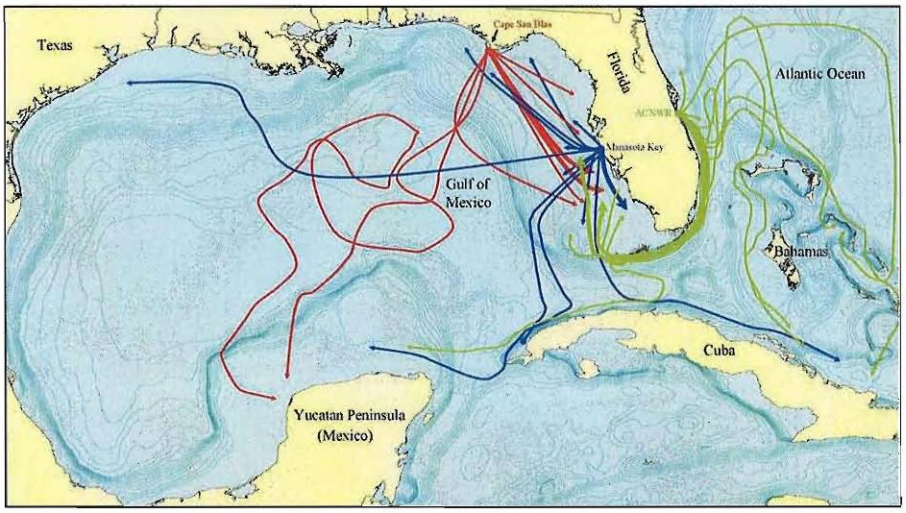


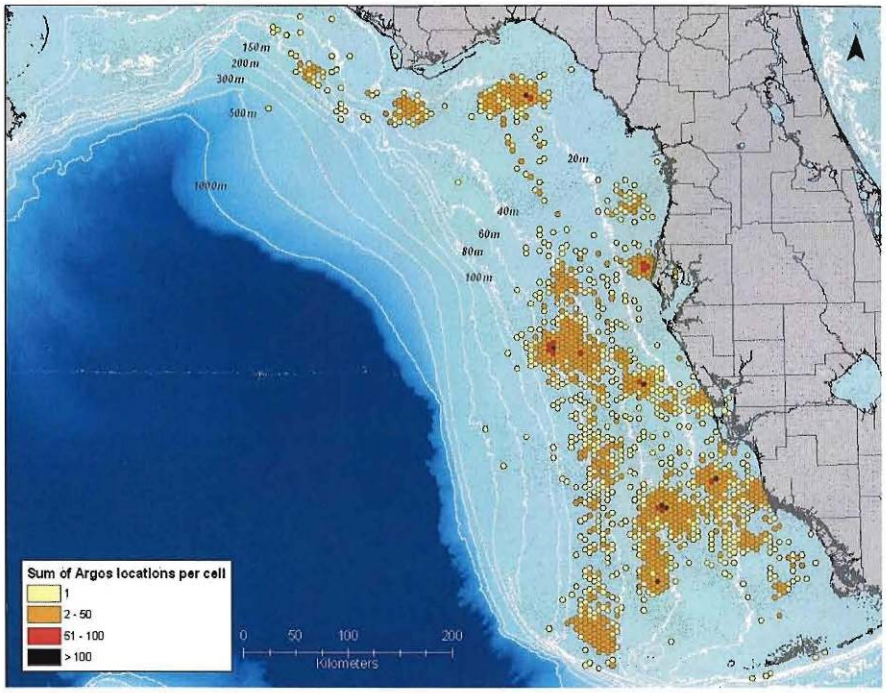
accurately reveal both spatial and temporal trends in Florida. INBS nest counts represent approximately 69 percent of known loggerhead nesting in Florida. Trend analysis of the last 20 years (1989–2008) of nest survey data shows a decrease of 26% in the annual nest density on surveyed shoreline over 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.)





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 C – 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
Chairman, Board of Trustees
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, Ph.D.
Staff Scientist
Sea Turtle Conservation and Research, Mote Marine Laboratory

cc: Dr. Kumar Mahadevan, MML
Dr. John Reynolds, MML

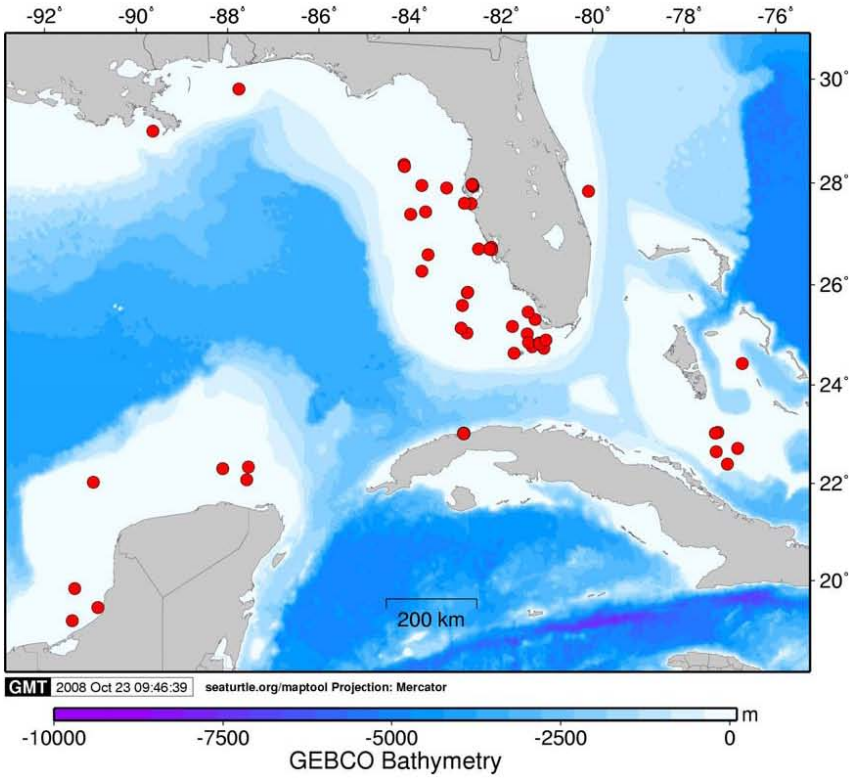


Figure 1. Foraging destinations of 46 loggerhead females tracked from Casey Key, Sarasota County rookery to home foraging areas. The females may stay in foraging residency for 1-6 years although most migrate every 2-4 years (also known as the remigration interval) to a natal beach. Data: T. Tucker/ Mote Marine Laboratory, in prep.

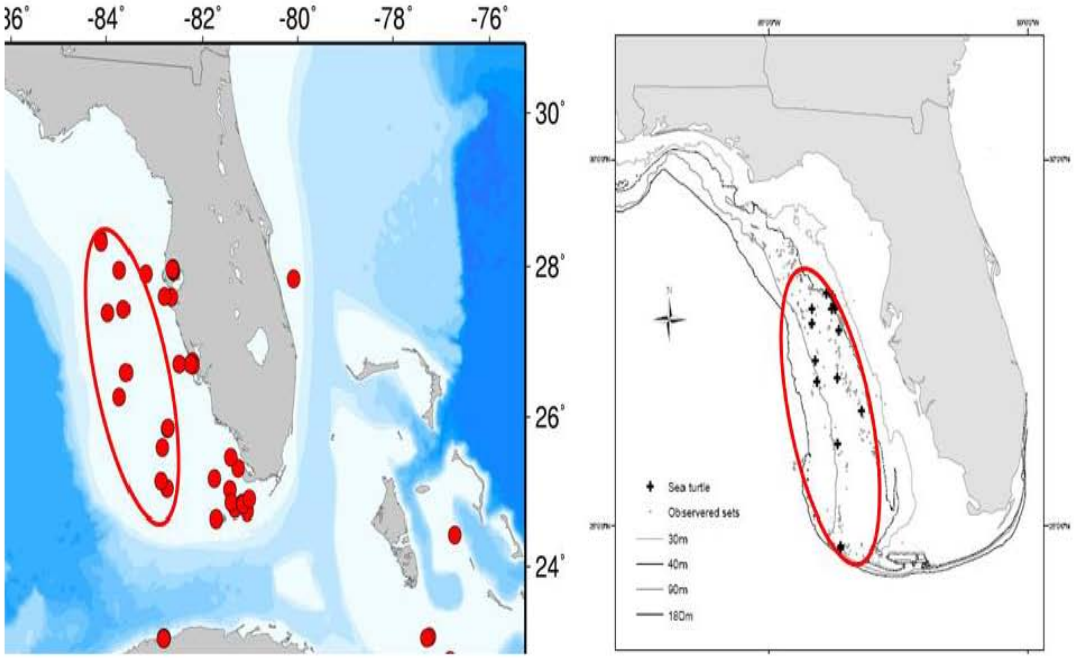


Figure 2 (left panel) shows satellite tracked loggerheads on the west Florida Shelf.
Figure 3 (right panel) shows spatial locations of Gulf of Mexico bottom longlines sets targeting reef fish and takes of sea turtles. Maps were aligned by eye in this side-by-side comparison since GIS coordinates were unavailable with the NMFS data. Right panel is adapted from NMFS-SEFSC PRD 07/08-15.

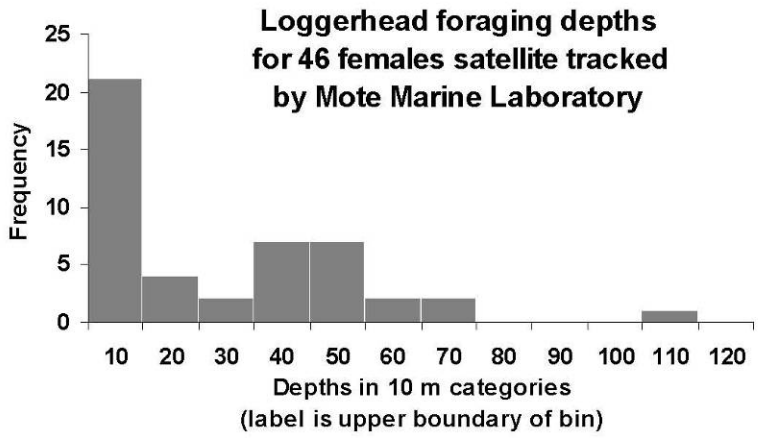


Figure 4. Depths of loggerhead foraging grounds were based on bathymetry of satellite telemetry of locations. Takes of turtles in the grouper longline fishery were primarily between 20-50 fathoms (= 36-91 meters). This fishing zone by depth overlaps with 32.6% (15/46) of the loggerhead females tracked 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.