

FINAL REGULATORY AMENDMENT TO THE REEF FISH FISHERY MANAGEMENT PLAN

TO SET TOTAL ALLOWABLE CATCH FOR RED SNAPPER

February 2010

**(Including Revised Environmental Assessment,
Regulatory Impact Review, and
Regulatory Flexibility Analysis)**



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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	Acceptable biological catch
ACL	Annual catch limit
ACT	Annual catch target
AM	Accountability measure
AW	Assessment workshop
B	Biomass
B _{MSY}	The biomass that can support a harvest of the maximum sustainable yield
CS	Consumer surplus
CV	Coefficient of variation
EA	Environmental assessment
EEZ	Exclusive economic zone
EIS	Environmental impact statement
ELMR	Estuarine Living Marine Resources
ESA	Endangered Species Act
F	Fishing mortality
FMP	Fishery management plan
FMU	Fishery management unit
FWC	Florida Fish and Wildlife Conservation Commission
GMFMC	Gulf of Mexico Fishery Management Council
IFQ	Individual fishing quota
IRFA	Initial Regulatory Flexibility Analysis
LAPP	Limited Access Privilege Program
MMPA	Marine Mammal Protection Act
MP	Million Pounds
MRFSS	Marine Recreational Fisheries Statistics Survey
MRIP	Marine Recreational Information Program
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum sustainable yield
NMFS	NOAA's National Marine Fisheries Service
NOR	Net operating revenue
OFL	Overfishing limit
OY	Optimum yield
PS	Producer surplus
RIR	Regulatory impact review
SAFMC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, Review
SEFSC	Southeast Fisheries Science Center
SEIS	Supplemental environmental impact statement
SERO	Southeast Regional Office
SPR	Spawning potential ratio
SSB	Spawning stock biomass
SSBR	Spawning stock biomass per recruit
SSC	Scientific and Statistical Committee

TAC
TL

Total allowable catch
Total length

ENVIRONMENTAL ASSESSMENT COVER SHEET

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Name of Action

Regulatory Amendment to the Reef Fish Fishery Management Plan to Set Allowable Catch for Red Snapper

Type of Action

(X) Administrative
() Draft

() Legislative
(X) Final

ABSTRACT

Results from the red snapper update assessment in 2009, indicate that the red snapper stock is no longer undergoing overfishing and that total allowable catch could be increased. Management measures considered in this regulatory amendment are intended to increase the red snapper total allowable catch from 5.0 MP to 6.945 MP and make the resulting recreational and commercial quotas consistent with goals and objectives of the Gulf of Mexico Fishery Management Council's red snapper rebuilding plan. Based on the current 51% commercial and 49% recreational allocation of red snapper, the proposed total allowable catch increase would adjust the commercial and recreational quotas from 2.55 and 2.45 MP to 3.542 and 3.403 MP, respectively. The commercial sector is under an individual fishing quota program and has maintained landings within their quota in recent years. The projected recreational fishing season would range between 51 and 60 days because the recreational sector overharvested its allocation by approximately 75%. The final number of fishing days in the recreational season would be announced before the season opens on June 1.

EXECUTIVE SUMMARY

Results of a recently completed red snapper update assessment indicate that the red snapper stock is no longer undergoing overfishing and that total allowable catch could be increased. Management measures considered in this regulatory amendment are intended to increase the red snapper total allowable catch and make the resulting recreational and commercial quotas consistent with goals and objectives of the Gulf of Mexico Fishery Management Council's red snapper rebuilding plan.

This regulatory amendment proposes to increase red snapper total allowable catch from 5.0 million pounds (MP) (**Alternative 1**) to 6.945 MP (**Preferred Alternative 2**). The Council also considered **Alternative 3**, which would set total allowable catch at 6.019 MP. The Council selection of **Preferred Alternative 2** was based on the Scientific and Statistical Committee's acceptable biological catch recommendation, which is 75% of the overfishing limit (9.26 MP) defined in the 2009 red snapper stock assessment update. Based on the current 51% commercial and 49% recreational allocation of red snapper, the proposed total allowable catch increase would adjust the commercial and recreational quotas from 2.55 and 2.45 MP to 3.542 and 3.403 MP, respectively. The commercial sector, which is managed under an individual fishing quota program, has maintained landings within their quota in recent years. Under **Preferred Alternative 2**, the projected recreational fishing season would range between 51 and 60 days. The expected recreational fishing season is shorter than the 75-day season recorded in 2009 because the recreational sector overharvested its allocation by approximately 75%. Without the proposed increase in total allowable catch, the recreational season in 2010 would be expected to last between 34 and 40 days.

FISHERY IMPACT STATEMENT

The proposed action would increase red snapper total allowable catch from 5.0 MP to 6.495 MP and thus implement the Scientific and Statistical Committee's acceptable biological catch recommendation made following the 2009 stock assessment update. The commercial and recreational quota would be increased to 3.542 and 3.403 MP, respectively. Physical, biological, and socio-economic impacts expected from the proposed action are summarized below. Detailed analyses and discussion of these impacts are provided in Section 3.0.

The proposed increase in total allowable catch could indirectly affect the physical and biological environment. The commercial and recreational sectors primarily use bandit and hook-and-line gears, respectively. A small portion of the commercial bottom longline fishery lands red snapper. Vertical hook and line gear used by either the commercial or recreational sector has the potential to snag and entangle bottom structures, and both sectors typically anchor while fishing impacting or disturbing the bottom. The level and duration of effort together define the total cumulative amount of effort (i.e., gear-hours of soak time), which affects the potential for gear to impact the physical environment. The commercial fishery is under an individual fishing quota system, meaning if they have allocation they can fish year round. However, the recreational sector is limited to a fishing season, which is estimated to be between 51 and 60 days for 2010. The number of recreational fishing days for 2010 would be shorter than the 2009 fishing season,

due to the recreational sector overharvesting its allocation by 75% under the 75 day season. Shortening the recreational fishing season may concentrate effort in a shorter period of time, but is unlikely to place any additional impacts on the physical environment compared to fishing season 2009. While shortening the recreational season is not part of this action, the proposed increase in total allowable catch would make the impacts on the recreational season less than those of status quo. Effects on the biological environment due to total allowable catch increase are discussed in detail in both Amendments 22 and 27/14. However, no additional biological impacts are expected from the increase in total allowable catch, because the fishing mortality is at a rate below fishing mortality at maximum sustainable yield (F_{MSY}) and consistent with the stock rebuilding plan. However, once the recreational red snapper fishing season is closed effort likely shifts to other species. Little information is available on the biological impacts of effort shifting from red snapper to another co-occurring species such as: vermilion snapper, lane snapper, gray triggerfish, and gag. These effects are explored in more detail in Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico and revised in 2008 through Joint Amendment 27 to the Reef Fish FMP and Amendment 14 to the FMP for the Shrimp Fishery of the Gulf of Mexico (GMFMC 2007).

The management measure proposed in this regulatory amendment is expected to result in positive economic effects for the recreational and commercial sectors. For the recreational sector, the proposed measure is expected to result in an increase in consumer surplus of approximately \$3.74-\$3.85 million relative to the status quo. In the for-hire sector, increases in net operating revenues expected under the proposed action are estimated at approximately \$1.82-\$1.88 million relative to the status quo. For the commercial sector, changes in gross revenues expected from the implementation of the proposed action are estimated at approximately \$3.26 million relative to the status quo. Other species managed by the Council are not expected to be directly impacted by the proposed measure. However, indirect economic effects due to changes in targeting behavior triggered by the proposed increase in red snapper total allowable catch are possible. The proposed action is not expected to impact vessel safety.

SOCIAL IMPACT STATEMENT

The overall social impacts of the action within the Regulatory Amendment should be beneficial to both the recreational and commercial sectors over the short term with most benefits accruing to the commercial sector. It is anticipated that along with increased harvest of red snapper there would be increased trading of allocation among the participants of the commercial individual fishing quota program. There is anecdotal evidence that some commercial fishermen are building a catch history with species such as vermilion snapper in anticipation of an individual fishing quota program for that and other snappers. Therefore, if they continue to fish for substitute species, they may hold or trade some of their red snapper allocation. With increased trading of allocation, some fishing pressure may move from substitute species to red snapper as some commercial fishermen switch. Impacts to the recreational sector should also be beneficial in terms of a less stringent closure of the fishing season for red snapper. Because of past overages the season for 2010 will be significantly shorter than the prior year. However, the preferred action within this amendment could increase the recreational fishing season by as much as 20 days in contrast to the no action alternative. It is expected that most recreational harvesters

would switch to substitute species once they have reached their bag limit; however, there may be some high grading occurring as the size of average catch of red snapper has been increasing in recent years. This increase in average size might also be attributed to an improving stock. Once the season closes it is assumed that harvesters would target other species. While this action would affect fishing communities located within counties with Environmental Justice populations of concern, the overall impacts to these populations should be beneficial and therefore should have positive impacts on most participants, including subsistence harvesters.

1 INTRODUCTION

1.1 Background

The Gulf of Mexico (Gulf) red snapper stock is overfished; however, overfishing has been projected to end. Red snapper are taken as catch and bycatch by both the commercial and recreational sectors of the reef fish fishery, and also taken as bycatch in the Gulf shrimp trawl fishery. The considerable influence of all three fishing efforts on the status of red snapper challenges fishery managers to balance competing interests and goals in rebuilding the red snapper stock. The red snapper rebuilding plan established in 1990 has been revised and lengthened several times in response to new biological data and assessments, which have improved scientists understanding of the factors influencing red snapper mortality and rebuilding. The current red snapper rebuilding plan is designed to end overfishing of red snapper between 2009 and 2010, and to rebuild the red snapper stock by 2032. This plan was initially implemented in 2005 through Amendment 22 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico and revised in 2008 through Joint Amendment 27 to the Reef Fish FMP and Amendment 14 to the FMP for the Shrimp Fishery of the Gulf of Mexico (GMFMC 2007).

The 2005 red snapper benchmark assessment conducted by the Southeast Data, Assessment, and Review (SEDAR) process (SEDAR 7 2005) indicated yield will be maximized if the red snapper mortality rate is constrained to that associated with 26% spawning potential ratio (SPR). The Gulf of Mexico Fishery Management Council (Council) generally has controlled red snapper mortality in the commercial and recreational sectors by establishing a total allowable catch, of which 51% is allocated in a commercial quota and 49% allocated in a recreational quota. Actions taken in 2008 through Amendment 27/14 to revise the rebuilding strategy were intended to end overfishing by 2009 or 2010 and rebuild red snapper to the biomass that can support harvest of the maximum sustainable yield by 2032, in accordance with the Council's currently approved rebuilding plan (GMFMC 2004a). The SEDAR 7 report indicated a 74% reduction in total red snapper fishing mortality (both the commercial and recreational sectors of the reef fish fishery and the shrimp trawl fishery) from baseline levels (2001-03) was required to end overfishing of red snapper. However, based on rebuilding projections conducted by the Southeast Fisheries Science Center (SEFSC) in January through March 2007 (Chester 2007; SERO 2006), it was impractical to assume bycatch could be reduced to that extent for all fishery components. Using more realistic assumptions about reductions in bycatch and directed catch, the Council chose to set total allowable catch at 5 MP until the 2009 assessment update was completed. Under this harvest restriction and revised rebuilding plan, there was greater than a 50% probability of ending overfishing and rebuilding the stock to B_{MSY} .

As mentioned above, the intent of regulations implementing Amendment 27/14 was to end overfishing by 2009 or 2010 and attain the expected fishing mortality trajectory needed to achieve B_{MSY} by 2032. The rebuilding plan described that after 2010, total allowable catch would be increased consistent with a fishing mortality rate that produces maximum sustainable yield. The rate total allowable catch increases is contingent on the amount of shrimp bycatch mortality allowed. Under the Council's rebuilding plan, shrimp bycatch fishing mortality would

be set at 74% less than the 2001-03 baseline fishing mortality rate in 2008 through 2010, 67% in 2011, and decline constantly from 67 to 60% between 2011 and 2032. The Council's preferred rebuilding plan would allow total allowable catch to increase throughout the rebuilding plan and maximum sustainable yield would be 14.0 MP when the stock is fully rebuilt.

The SEDAR update assessment for Gulf of Mexico red snapper was conducted in August 2009, with the objective of updating the SEDAR 7 benchmark assessment conducted in 2005 (SEDAR 7 update 2009). The assessment updated, reviewed, and incorporated into the model all data streams included in SEDAR 7. Recognizing that new information on the biology, population dynamics, and fishery of red snapper has been developed since the 2005 assessment, the review not only provided a "continuity" run of model outputs, but also developed additional "alternative state" models addressing these changes. In summary, the conclusions of the assessment update, as reviewed and approved by the Council's Scientific and Statistical Committee, project overfishing has likely ended in 2009, and therefore total allowable catch can be increased (see Section 2.2.1 for discussion of the update).

It should be noted the Council's rebuilding plan is consistent with the reauthorized Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended through January 12, 2007, and the National Standard 1 Guidelines (74 FR 3178) which require Councils to develop annual catch limits and accountability measures for all stocks under their jurisdiction. Annual catch limits are upper boundaries for fishery harvest that ensure catches do not lead to overfishing. Currently quotas for both sectors act as those upper boundaries. If the annual catch limits are exceeded, the accountability measures ensure adjustments in catch the following year are sufficiently reduced to keep overfishing from occurring again.

Accountability measures for red snapper are sector specific. For the commercial sector, the accountability measures are the commercial quota, which causes the sector to close once met, and the individual fishing quota program the commercial sector currently operates under. In the individual fishing quota program, shares and allocation of quota are distributed to eligible participants. Once all allocation is expended, no more red snapper can be landed; therefore, there is no possibility of a quota overrun for the commercial sector. There is an opportunity, during their last trip of the fishing year, for commercial red snapper fishermen to exceed their remaining available allocation by 10%. However, any such overage by an individual fisherman is deducted from the allocation distributed to that participant the following year. Like the commercial sector, the recreational sector also operates under a quota. Given the quota, the season length can be shortened to attempt to constrain the sector to its quota. The National Marine Fisheries Service has found it necessary during 2008 and 2009 to conduct an analysis to project when red snapper recreational landings would meet their quota during the June 1 through September 30 fishing season. In 2008 and in 2009, National Marine Fisheries Service projected the recreational quota would be met in August, and closed the recreational fishery before season's end.

1.2 Purpose and Need

The purpose of this consolidated environmental assessment and regulatory amendment is to propose an increase in total allowable catch and make the resulting recreational and commercial

quotas consistent with the goals and objectives of the Council's red snapper rebuilding plan to achieve the mandates of the Magnuson-Stevens Act. The recreational and commercial allocation of the stock annual catch limit will remain consistent with Amendment 1 where 49% is allocated to the recreational fishery and 51% is allocated to the commercial fishery (GMFMC 1989).

The 2009 update stock assessment of the Gulf of Mexico red snapper stock (available at the Council's webpage: www.gulfcouncil.org) indicated that although the stock is still overfished, the stock is rebuilding and overfishing was projected to end in 2009. Based on their review of the assessment update, the Council's Scientific and Statistical Committee established an overfishing limit of 9.26 MP for 2010, the maximum catch allowed without overfishing. The Scientific and Statistical Committee recommended an acceptable biological catch of 6.945 MP in 2010, 25% below the overfishing limit to account for scientific uncertainty and in accordance with the National Standard 1 Guidelines (74 FR 3178). The 2010 allowable biological catch value (6.945 MP) recommended by the Scientific and Statistical Committee is greater than the current rebuilding plan's 2010 total allowable catch of 5.0 MP.

Assuming the selected total allowable catch for 2010 is not exceeded, the Scientific and Statistical Committee recommended acceptable biological catch limits for 2011 of 7.185 MP and 7.485 MP for 2012. Subsequent increases in acceptable biological catch recommended by the Scientific and Statistical Committee would be consistent with a constant fishing mortality rebuilding plan. To make the language from Amendment 27/14 consistent with the National Standard 1 Guidelines, total allowable catch is equivalent to the stock annual catch limit.

The Magnuson-Stevens Act requires National Marine Fisheries Service and regional fishery management councils to prevent overfishing, and achieve, on a continuing basis, the optimum yield from federally managed fish stocks. These mandates are intended to ensure fishery resources are managed for the greatest overall benefit to the nation, particularly with respect to providing food production and recreational opportunities, and protecting marine ecosystems. To further this goal, the Magnuson-Stevens Act requires fishery managers to specify through rebuilding plans their strategy for rebuilding overfished stocks to a sustainable level within a certain time frame, provide accountability measures to minimize the risk of overharvest, to minimize bycatch and bycatch mortality to the extent practicable, and to ensure that management decision are based on the best available scientific information.

1.3 History of Management

A brief history of management is provided below as it pertains to this action. A more complete summary of red snapper management can be found in Amendment 27/14 and in Hood et al. (2007). Information on management of the reef fish fishery as a whole can be obtained by contacting the Council.

The **Reef Fish FMP** (with its associated environmental impact statement [EIS]) was implemented on November 8, 1984, and defined the reef fish Fishery Management Unit (FMU) to include red snapper and other important reef fish. Section 5.2.1 of the FMP describes the FMU defined by the Reef Fish FMP which includes red snapper. The FMPs implementing

regulations were designed to rebuild declining reef fish stocks and included: 1) Prohibitions on the use of fish traps, roller trawls, and power head-equipped spear guns within an inshore stressed area; 2) a minimum size limit of 13 inches total length (TL) for red snapper, with exceptions that for-hire boats were exempted until May 8, 1987, and each angler could keep five undersize fish; and 3) the specification of optimum yield (OY) for snapper and grouper.

Amendment 1 to the Reef Fish FMP (with its associated EA, RIR, and IRFA) was implemented on February 21, 1990. The primary objective of the amendment was to stabilize long-term population levels of all reef fish species by January 1, 2000, at a level that equaled at least 20% of the spawning stock biomass per recruit (SSBR) that would occur with no fishing.

Amendment 3 (with its associated EA, RIR, and IRFA), implemented on July 29, 1991, added flexibility to the annual framework procedure for specifying total allowable catch by allowing rebuilding timeframes to be adjusted in response to changing scientific advice, with the exception that the maximum time to rebuild could not exceed 1.5 times the generation time of the species under consideration. Additionally, the amendment revised OY and overfishing definitions, replaced the 20% SSBR target with a target of 20% SPR, and specified 2007 as the target year to rebuild the stock to 20% SPR. This framework was updated in **Amendment 18A** (with its associated EA, RIR, and IRFA), implemented on September 8, 2006, to account for the SEDAR process.

Amendment 4 (with its associated EA and RIR), implemented on May 8, 1992, established a moratorium on the issuance of new reef fish permits for a maximum period of three years. This moratorium was extended in **Amendment 9** (with its associated EA and RIR, implemented on July 27, 1994), **Amendment 11** (with its associated EA and RIR implemented January 1, 1996), and **Amendment 17** (with its associated EA and RIR), implemented on August 2, 2000). It was extended indefinitely in **Amendment 24** (with its EA, RIR, and IRFA, implemented on August 17, 2005). An **emergency rule**, effective December 30, 1992, created a red snapper endorsement to the reef fish permit. This endorsement was made permanent in **Amendment 6** (with its associated EA, RIR, and IRFA; implemented on June 29, 1993), **Amendment 11**, and **Amendment 13** (with its associated EA and RIR, implemented on September 15, 1996).

Amendment 7 (with its associated EA, RIR, and IRFA), implemented on February 7, 1994, established reef fish dealer permitting and record keeping requirements. The Secretary disapproved one provision of the amendment, which would have limited the sale of reef fish to permitted dealers. However, this provision was ultimately implemented in **Amendment 11**.

Amendment 20 (with its associated EA and RIR), implemented on June 16, 2003, established a three-year moratorium on the issuance of new charter and head boat vessel permits in Gulf reef fish to limit further expansion in the for-hire fisheries while the Council considered the need for more comprehensive effort management systems. This moratorium was extended indefinitely in **Amendment 25** (with its SEIS, RIR, and IRFA), implemented June 15, 2006).

Amendment 22 (with its SEIS, RIR, and IRFA), implemented on July 5, 2005, set post-SFA biological reference points and status determination criteria for red snapper, established a

rebuilding plan for the red snapper stock, and specified a reporting program to improve bycatch monitoring in the reef fish fishery.

Amendment 26 (with SEIS, RIR, and IRFA), effective on January 1, 2007, established an individual fishing quota program for the commercial red snapper fishery. Quota shares are freely transferable to other reef fish permit holders during the first 5 years following implementation and to anyone thereafter.

An interim rule, published on April 2, 2007, reduced the red snapper total allowable catch quota to 6.5 MP, resulting in a commercial quota of 3.315 MP and a recreational quota of 3.185 MP; reduced the red snapper recreational bag limit from four fish to two fish per person per day; prohibited the captain and crew of for-hire vessels from retaining the recreational bag limit; reduced the commercial minimum size limit from 15-inches to 13-inches total length; and established a target red snapper bycatch mortality reduction goal for the shrimp fishery that equates to 50% of the bycatch mortality that occurred during 2001-2003 and a level of shrimp effort equal to that observed in the fishery in 2005.

Joint Reef Fish FMP Amendment 27/Shrimp FMP Amendment 14, (with an EIS, RIR, and IRFA) was implemented February 28, 2008, except for reef fish bycatch reduction measures that became effective on June 1, 2008. This amendment addressed overfishing and stock rebuilding for red snapper. The amendment reduced total allowable catch to 5.0 MP (2.55 MP and 2.45 MP commercial recreational quotas respectively) and adjusted the recreational fishing measures to a 2 fish bag limit, 16-inch TL minimum size, and a fishing season from June 1 through September 30. It also required the use of non-stainless steel circle hooks when using natural baits to fish for Gulf reef fish effective June 1, 2008, and required the use of venting tools and dehooking devices when participating in the commercial or recreational reef fish fisheries effective June 1, 2008. In addition, the amendment established a 74% reduction in shrimp effort compared to average effort levels of 2001-2003, and possible closed areas should this target not be met. This action replaced the dependence on BRDs by the shrimp fishery to reduce red snapper bycatch.

2 AFFECTED ENVIRONMENT

The action considered in this regulatory amendment would affect fishing in the Gulf of Mexico (Gulf) region (Figure 2.1). Therefore, the following descriptions of the physical, biological, economic, social, and administrative environments focus primarily on this region.

2.1 Physical Environment

The physical environment for reef fish, including red snapper, have been described in detail in the Environmental Impact Statement for the Generic Essential Fish Habitat Amendment and is incorporated here by reference (GMFMC 2004b). The Gulf has a total area of approximately 600,000 square miles (1.5 million km²), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel. Oceanic conditions are primarily affected by the Loop Current, the discharge of freshwater into the Northern Gulf, and a semi-permanent, anticyclonic gyre in the western Gulf. Gulf water temperatures range from 12° C to 29° C (54° F to 84° F) depending on time of year and depth of water. In the Gulf, adult red snapper are found in submarine gullies and depressions; over coral reefs, rock outcroppings, and gravel bottoms; and are associated with oil rigs and other artificial structures (GMFMC, 2004b).

Environmental Sites of Special Interest Relevant to Red Snapper (Figure 2.1.1)

Longline/Buoy Gear Area Closure - Permanent closure to use of these gears for reef fish harvest inshore of 20 fathoms off the Florida shelf and inshore of 50 fathoms for the remainder of the Gulf (72,300 square nautical miles). Note: A reasonably foreseeable future action in Amendment 31 could alter the boundaries to this area closure on a seasonal basis.

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

The Edges – No-take area closure from January 1 to April 30. All commercial and recreational fishing or possession of fish managed by the Council is prohibited. The intent of the closure is to protect gag and other groupers during their respective spawning seasons. Possession would be allowed when transiting the area if gear is stowed in accordance with federal regulations. This area is not shown in Figure 2.1.1 due to its recent implementation. The boundaries of the closed area are: Northwest corner = 28° 51'N, 85° 16'W; Northeast corner = 28° 51'N, 85° 04'W; Southwest corner = 28° 14'N, 84° 54'W; Southeast corner = 28° 14'N, 84° 42'W.

Tortugas North and South Marine Reserves - No-take marine reserves cooperatively implemented by the state of Florida, National Ocean Service (NOS), the Council, and the National Park Service (see jurisdiction on chart) (185 square nautical miles). In addition, Generic Amendment 3 for addressing Essential Fish Habitat requirements, Habitat Areas of Particular Concern (HAPC), and adverse effects of fishing in the following FMPs of the Gulf: Shrimp, Red Drum, Reef Fish, Stone Crab, Coral and Coral Reefs in the Gulf and Spiny Lobster

and the Coastal Migratory Pelagic resources of the Gulf and South Atlantic (GMFMC 2005a) prohibited the use of anchors in these HAPCs.

Additionally, Generic Amendment 3 for addressing Essential Fish Habitat requirements (GMFMC 2005a) establishes an education program on the protection of coral reefs when using various fishing gears in coral reef areas for recreational and commercial fishermen.

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

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

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

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

Alabama Special Management Zone (SMZ) - In the Alabama SMZ, fishing by a vessel operating as a charter vessel or head boat, a vessel that does not have a commercial permit for Gulf reef fish, or a vessel with such a permit fishing for Gulf reef fish, is limited to hook-and-line gear with no more than 3 hooks. Nonconforming gear is restricted to bag limits, or for reef fish without a bag limit, to 5% by weight of all fish aboard.

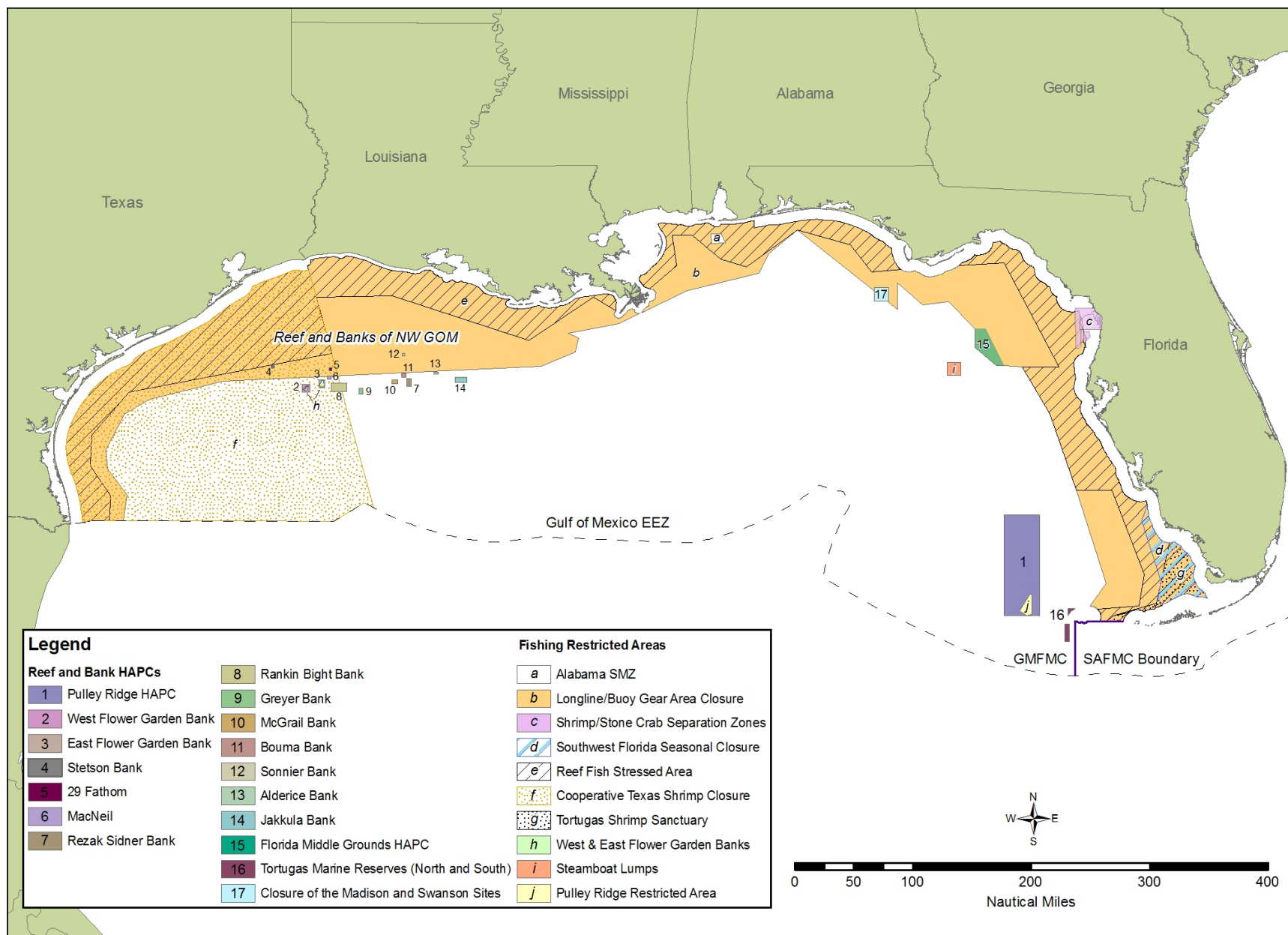


Figure 2.1.1 Map of most fishery management closed or gear restricted areas in the Gulf of Mexico

2.2 Biological Environment

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

2.2.1 Red Snapper and Reef Fish

Red Snapper Life History and Biology

Red snapper demonstrate the typical reef fish life history pattern (GMFMC 2004b). Eggs and larvae are pelagic while juveniles are demersal. Juveniles are found associated with bottom features or over barren bottom. Spawning occurs over firm sand bottom with little relief away from reefs during the summer and fall. Adult females mature as early as 2 years and most are mature by 4 years (Schirripa and Legault 1999). Red snapper have been aged up to 57 years, but most caught by the directed fishery are 2- to 4-years old (Wilson and Nieland 2001). A more complete description of red snapper life history can be found in the Council's Essential Fish Habitat EIS (GMFMC 2004b).

Status of the Red Snapper Stock and SSC Recommendations

The most recent red snapper stock assessment was completed in December 2009. A SEDAR assessment workshop (AW) was convened in Miami, Florida, from August 24-28, 2009, to review and update the 2005 benchmark stock assessment for red snapper. The AW panel updated, reviewed, and incorporated into the model all data streams (through 2008) used in the 2005 benchmark assessment. The updated assessment included an updated continuity model, similar to the model run approved during the SEDAR 7 stock assessment, and 14 alternative state model runs. The intent of the assessment update was to update population and status measures to provide overfishing limit and acceptable biological catch recommendations in compliance with new guidelines for annual catch limits (SEDAR Red Snapper Update 2009). The results of the update assessment were reviewed and approved by the Gulf Council's Scientific and Statistical Committee and Reef Fish Scientific and Statistical Committee in December 2009. The following is a brief summary of the updated assessment. For a more detailed description of the assessment go to: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=00.

The status of Gulf red snapper was evaluated using the CATCHEM algorithm. Data from 1872 through 2008 were incorporated into the model. Red snapper were separated into eastern and western sub-stocks, each with five fleets: commercial handline, commercial longline, recreational, closed season discards, and shrimp trawl bycatch. The assessment model incorporated commercial landings dating back to 1872, recreational landings dating back to 1946, and shrimp trawl effort in offshore waters from 1960-2008. Consistent with the 2005 benchmark assessment, commercial and recreational open season discards were assumed to occur predominately due to minimum size limit regulations and were inferred by the CATCHEM model based on corresponding landings and growth parameters (SEDAR Red Snapper Update 2009). Closed season discards for both the commercial and recreational fishery were estimated using self-reported data. Release mortality rates were assumed to be 15 and 40% for the eastern and western Gulf recreational sectors and 72 and 81% for the eastern and western Gulf commercial sectors. Four fishery-dependent (commercial handline east and west, recreational

MRFSS east and west) indices and eight fishery-independent indices (SEAMAP video survey, SEAMAP larval survey, SEAMAP bottom trawl survey age-0 and age-1) were incorporated into the assessment model and used to estimate trends in population abundance for the eastern and western Gulf. The National Marine Fisheries Service's bottom longline survey was also used as an index of abundance for several alternative state runs of the model. Notable differences between the 2009 continuity model run and the 2005 SEDAR benchmark assessment included: 1) higher estimates of closed season discards, 2) changes in methodology for calculating some abundance indices, 3) use of true ages rather than annual ages when calculating age composition, 4) using only shrimp effort in depths greater than 10 fathoms rather than total shrimp effort, and 5) divergence in the SEAMAP trawl index of abundance.

The base continuity run fit landings, shrimp effort, and age composition well, but fit indices of abundance poorly. For several indices of abundance, the predicted fit did not track upward trends in abundance indices. The continuity run indicated little change in red snapper stock biomass and continued to predict high rates of fishing mortality. Based on the results of the continuity run, the AW panel decided to explore 14 additional alternative state model runs to evaluate the influence of various hypotheses and parameters on model fit. The AW panel ultimately settled on three alternative state models for consideration.

Alternative state model 1 was similar to the continuity run, but doubled the natural mortality rate on age-0 and age-1 red snapper. This decision was based on several published and unpublished studies, which indicated natural mortality on juvenile red snapper was higher than estimated in the SEDAR 7 stock assessment. Alternative state model 2 capped the effective sample size of age composition data, rescaled coefficients of variation (CV) for indices of abundance, and incorporated the National Marine Fisheries Service bottom longline survey index. Alternative state model 3 was similar to alternative state model 2, except natural mortality on age-0 and age-1 red snapper was doubled. In alternative state models 2 and 3, sample size was capped for age composition data and index CVs were rescaled to deemphasize the influence of age-composition data on model results and improve the fit to indices of abundance. The inclusion of the National Marine Fisheries Service bottom longline index and corresponding age composition data for the western Gulf sub-stock in these alternative state models indicated proportionally larger, older fish.

The assessment workshop panel unanimously recommended alternative state model 3 as the preferred model for evaluating stock status because this model provided a much better fit to the indices of abundance. Alternative state model 3 indicated fishing mortality had declined significantly in recent years and projected overfishing would end in 2009 (Figure 2.2.1.1). Spawning stock biomass (SSB) was also estimated to increase significantly (Figure 2.2.1.2). The ratio of SSB to $SSB_{26\%SPR}$ reached a low of 6.2% in 1989; $SSB/SSB_{26\%SPR}$ gradually increased to 13.1% in 2006 before rapidly increasing to 21.9% in 2009. Alternative state model 3 estimates the overfishing limit for red snapper in 2010 to be 9.26 MP. However, because there is considerable uncertainty around assessment model results, the Scientific and Statistical Committee decided to set the acceptable biological catch at 75% of the overfishing limit, which is 6.945 MP. When setting the total allowable catch for red snapper in 2010, the Gulf Council cannot exceed the acceptable biological catch recommended by the Council's Scientific and Statistical Committee.

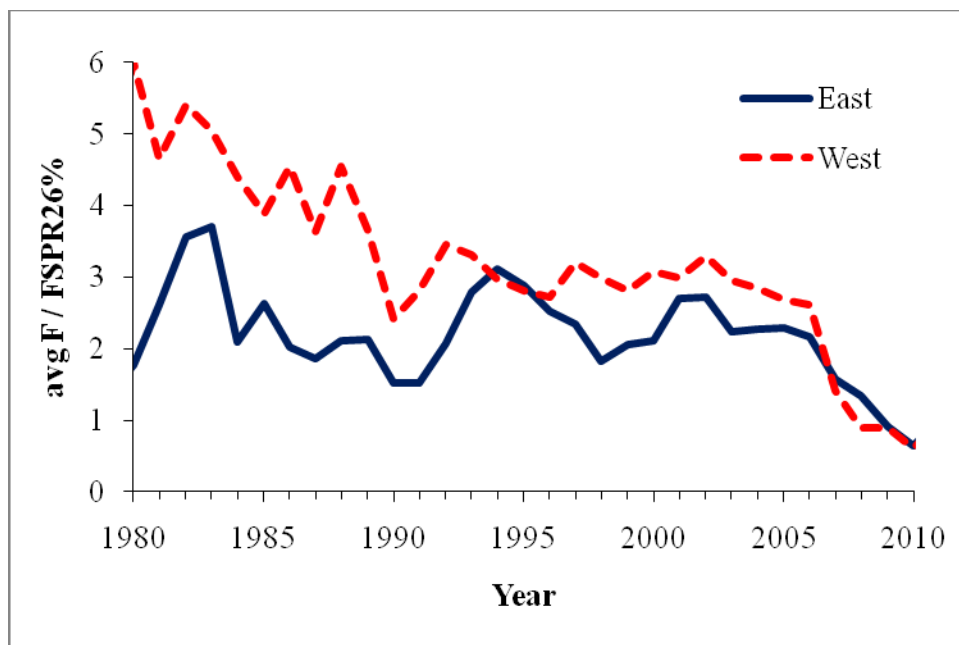


Figure 2.2.1.1. Trends in red snapper fishing mortality (avg. $F/F_{26\%SPR}$) for the eastern and western Gulf of Mexico, 1980-2010. Overfishing is occurring if $F/F_{26\%SPR}$ is greater than 1.0. Source: B. Linton, personal communication.

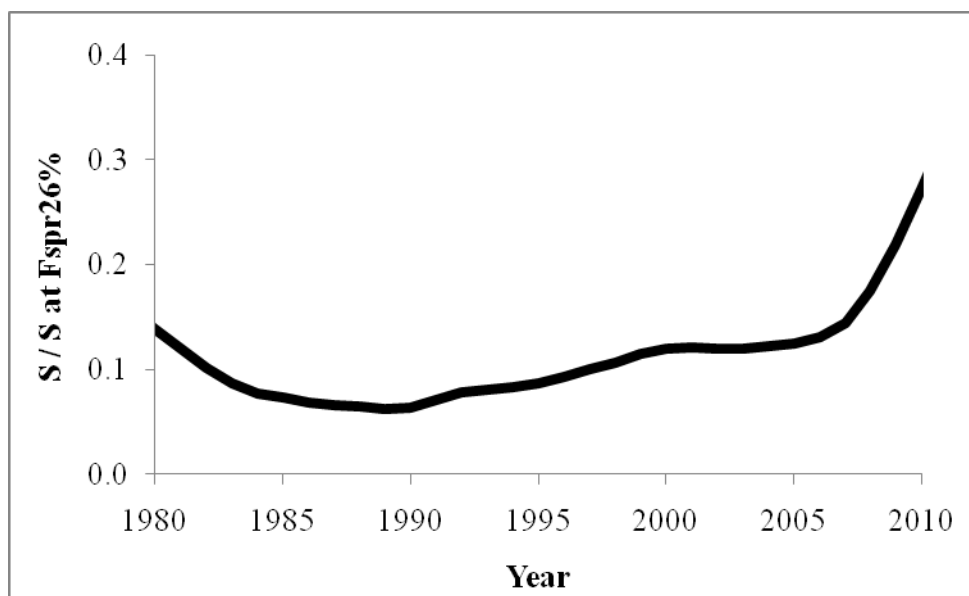


Figure 2.2.1.2. Gulf-wide trend in red snapper spawning stock biomass ($SSB/SSB_{26\%SPR}$), 1980-2010. The stock is considered overfished if $SSB/SSB_{26\%SPR}$ is less than the minimum stock size threshold. Source: B. Linton, personal communication.

General Information on Reef Fish Species

The National Ocean Service of NOAA collaborated with National Marine Fisheries Service and the Council to develop distributions of 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). National Ocean Service staff analyzed the data to determine relative abundance of the mapped species by estuary, salinity zone, and month. For some species not in the ELMR database, distribution was classified as only observed or not observed for adult, juvenile, and spawning stages.

Habitat types and life history stages can be found in more detail in GMFMC (2004b). In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. In general, both eggs and larval stages are planktonic. Larvae feed on zooplankton and phytoplankton. Exceptions to these generalizations include the 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 found over sand and soft-bottom substrates. Juvenile red snapper are common on mud bottoms 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 in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC 1981). More detail on hard bottom substrate and coral can be found in the FMP for Corals and Coral Reefs (GMFMC and SAFMC 1982).

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; SEDAR 7 Update 2009), 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 2002a; SEDAR 12 2007), gag (Turner et al. 2001; SEDAR 10 2006), 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 third quarter report of the 2009 Status of U.S. Fisheries (<http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm>) classifies four as overfished (greater amberjack, grey triggerfish, gag, and red snapper), and the same four as undergoing overfishing. This amendment addresses overfishing relative to a projected improvement in the red snapper stock. 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.

2.2.2 Protected Species

There are 28 different species of marine mammals that may occur in the Gulf. All 28 species are protected under the Marine Mammals Protection Act and six are also listed as endangered under the Endangered Species Act (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 Essential Fish Habitat amendment (GMFMC 2004b) and the October 2009 ESA biological opinion on the reef fish fishery (NMFS 2009d). Marine Mammal Stock Assessment Reports and additional information are also available on the National Marine Fisheries Service Office of Protected Species website: <http://www.nmfs.noaa.gov/pr/species/>.

The Gulf reef fish fishery is classified in the 2010 Marine Mammal Protection Act List of Fisheries as Category III fishery (74 FR 58859). 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 removal¹. Dolphins are the only species documented as interacting with this fishery. Bottlenose dolphins may predate and depredate on the bait, catch, and/or released discards of the reef fish fishery.

All five species of sea turtles may be adversely affected by the Gulf reef fish fishery via incidental capture in hook-and-line gear (NMFS 2009d). Incidental captures of sea turtle species occur in all commercial and recreational hook-and-line components of the reef fishery, but recent observer data indicate they are most frequent in the bottom longline component of the reef fish fishery. On an individual set basis, incidental captures may be relatively infrequent, but collectively, these captures sum to a high level of bycatch. Observer data indicate loggerhead sea turtles are the species most affected by the bottom longline component of the reef fish fishery and that is why a more detailed description of this species is included below. Mortality of sea turtles caught is particularly problematic in this fishery component, because many are dead or in poor condition upon retrieval of the gear as a result of forced submergence (i.e., drowning). Rulemaking from Amendment 31 proposes to constrain the bottom longline component of the fishery to limit sea turtle take. All sea turtles caught on hook-and-line and released alive may later succumb to injuries sustained at the time of capture or from exacerbated trauma from fishing hooks or lines that were ingested, entangling, or otherwise still attached when they were released. Sea turtle release gear and handling protocols are required to reduce the amount of gear on released animals and minimize post-release mortality.

¹The potential biological removal is the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population

Smalltooth sawfish are also affected by the Gulf reef fish fishery, but to a much lesser extent than hardshell sea turtles. Smalltooth sawfish primarily occur in the Gulf off peninsular Florida. Although the long, toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in fishing gear, incidental captures in the commercial and recreational hook-and-line components of the reef fish fishery are rare events. Only eight smalltooth sawfish are estimated to be incidentally caught annually, and none are expected to result in mortality (NMFS 2009d). Fishermen in this fishery are required to follow smalltooth sawfish safe handling guidelines.

2.3 Economic Environment

Fishery data for 2009 is not complete. As a result, the following sections cover data, where available, only through 2008.

2.3.1 Commercial Sector

Information on the performance of the Gulf of Mexico commercial red snapper sector of the reef fish fishery prior to the implementation of the current individual fishing quota program, as well as discussion of the expected effects of the individual fishing quota program, is provided in GMFMC (2006) and is incorporated herein by reference. The individual fishing quota program became effective January 1, 2007. Because the implementation of the individual fishing quota program substantially altered the structure and performance of the sector, data since individual fishing quota implementation is more relevant to characterizing the sector and projecting the effects of management change. Therefore, the following discussion focuses on data from 2007 and 2008. Information on the performance of the individual fishing quota program is provided in NMFS (2008) and NMFS (2009a) and is incorporated herein by reference. The following section provides a brief summary of the information in NMFS (2009a), which includes comparisons of the 2007 and 2008 red snapper fishing seasons.

2.3.1.1 Fishery Performance under the Individual Fishing Quota Program

Management of the Gulf of Mexico commercial red snapper sector of the reef fish fishery under an individual fishing quota program has resulted in a reduction in the number of participants in the sector. Upon the implementation of the individual fishing quota program on January 1, 2007, 546 individuals qualified for initial individual fishing quota shares. Share transactions since initial share allocation reduced the number to shareholders to 489 by December 31, 2007, and to 466 by December 31, 2008. A total of 140 share transfers were recorded the first year of the program, while an additional 44 share transfers occurred in 2008 (a share transfer need not involve all shares owned by a particular entity nor result in exit of an entity from the fishery; hence, the number of share transactions may, as has been the case, be greater than the number of entities that exit the fishery). The average price paid per 0.0001% share (equal to 1 pound under a 1 MP quota, 5 pounds under a 5 MP quota, etc.) in 2007 was approximately \$19.47 (2008 dollars) and approximately \$22.70 in 2008.

While share transfers represent permanent transfer of the harvest rights represented by those shares (until re-sold or altered by potential program change), allocation transfers only bestow harvest rights for a single season. In 2007, approximately 2.26 MP, or approximately 76%, of the approximately 2.99 MP allocation (gutted weight resulting from the 3.315 MP whole weight commercial quota) were involved in allocation transactions, with approximately 26% of these transactions the result of apparent consolidation of shares by same-owner entities (i.e., an entity owning allocation on multiple permits consolidating the shares to a single or fewer permits). The proportion of allocation transferred in 2008 decreased relative to 2007, with only approximately 68% of the quota involved in allocation transfers, and only approximately 13% of the pounds transferred involved trading within the same entity. The average price of transfer per pound of allocation was approximately \$1.95 (2008 dollars) in 2007 and approximately \$2.45 in 2008.

In addition to the reduction in the number of entities owning red snapper individual fishing quota shares, share and allocation transfers reduced the number of vessels with recorded red snapper landings. In 2007, 309 vessels landed red snapper, while 300 vessels landed red snapper in 2008 (it should be noted that these totals are slightly less than the total number of vessels with recorded landings in the National Marine Fisheries Service Southeast Coastal Fisheries Logbook data (logbook), in which the number of vessels with recorded red snapper landings was 319 in 2007 and 305 in 2008). The decrease in the number of vessels from 2007 to 2008 was accompanied by a reduction in the total number of fishing trips with red snapper landings and days away from port. The average number of trips per vessel and days away from port also declined from 2007 to 2008, by approximately 8% (from 8.63 trips per vessel in 2007 to 7.96 trips per vessel in 2008) and 6% (from 4.2 days per trip in 2007 to 3.96 days per trip in 2008), respectively. However, the 23% reduction in the commercial quota from 2007 to 2008 relative to 2007 may have been a greater factor in the declines in the number of trips and days away from port than potential efficiency effects of the individual fishing quota program.

Over two-thirds of the vessels landing red snapper in both 2007 and 2008 reported landing red snapper in Florida. However, only approximately 40% of the total landings occurred in Florida, which accounted for approximately 39% of Gulf-wide landings in 2007 and approximately 41% in 2008. Texas led all states in 2007, accounting for approximately 41% of all landings, but accounted for only approximately 36% in 2008. Gulf-wide landings by month in 2007 ranged from a high of approximately 11.1% in February and December to a low of approximately 3.5% in January. The low January landings in 2007 were possibly a result of the newness of the program, as January landings more than doubled in absolute terms in 2008 and tripled in terms of percentage of the annual quota (approximately 10.5%). Monthly landings in 2008 ranged from a high of approximately 13.8%, again in February, to a low of approximately 4% in September. Other than the low January total in 2007, the highest landings in both years generally occurred during December through April.

Florida landings also received the highest average ex-vessel price, with fishermen receiving, on average across the entire year, approximately \$3.95 per pound in 2007 (2008 dollars; \$3.80 in nominal 2007 dollars) and approximately \$3.96 per pound in 2008. Gulf-wide, the average ex-vessel price per pound was approximately \$3.68 in 2007 (2008 dollars; \$3.54 in nominal 2007 dollars) and approximately \$3.69 in 2008. Texas transactions recorded the lowest average prices

in both 2007 and 2008, and were \$0.51 lower than Florida average price in 2007 and \$0.63 lower in 2008.

2.3.1.2 Total Harvests and Revenues

The following discussion is based on analysis of logbook data. Over the 2007-2008 fishing years, total red snapper logbook-recorded landings were approximately 5.462 MP valued at \$18.871 million (ex-vessel value, 2008 dollars), or approximately 2.731 MP valued at \$9.435 million per year. In addition to these landings and revenues, vessels with recorded red snapper landings harvested other species on trips on which red snapper were harvested, as well as on other trips targeting other species over the course of each year. The total average number of trips per vessel for all fishing (with or without red snapper harvests) was approximately 15 trips in 2007 and 16 trips in 2008, indicating each vessel, on average, took as many trips with no red snapper harvests as trips with red snapper harvests. It should be emphasized, however, that this result applies only on average and vessels with higher red snapper allocations may have taken fewer trips on which no red snapper were harvested, as well as the converse.

The total value of all species (including red snapper) on all trips by vessels with recorded landings of red snapper for 2007 and 2008 was approximately \$59.887 million, or approximately \$28.943 million per year. As a percentage of total revenues across all vessels, red snapper accounted for an average of approximately 34% of total revenues from all species in 2007 and approximately 30% in 2008. Although red snapper revenues declined by approximately \$2.7 million in 2008 relative to 2007 as a result of the reduced quota in 2008 (the average real price (2008 dollars) only increased by one cent in 2008 from 2007), total revenues from all species only declined by approximately \$2 million, indicating some ability of species substitution. On trips where red snapper were harvested, red snapper revenues were, on average, more important in 2007, accounting for approximately 52% of total vessel revenues for those trips, declining to approximately 47% in 2008.

2.3.1.3 Dealers

Commercial vessels landing reef fish, including red snapper, can only sell their catch to federally permitted fish dealers. On December 23, 2009, there were 186 reef fish dealer permits, of which 82 possessed the required individual fishing quota dealer endorsement necessary to purchase red snapper. Most of the individual fishing quota permitted dealers had addresses listed in Florida (55), with 10 listed in Louisiana, 8 in Texas, 5 in Alabama, 2 in Mississippi, and 2 in New York. Because there are no income or sales requirements to acquire a federal dealer permit, the total number of dealers can vary over the course of the year and from year to year.

2.3.1.4 Economic Impacts

Estimates of the economic activity (impacts) associated with the Gulf of Mexico commercial red snapper harvests were derived using the model developed for and applied in NMFS (2009c). Based on the average annual ex-vessel revenues for red snapper over the period 2007-2008 of \$9.44 million (2008 dollars), the commercial red snapper harvests are estimated to support 1,778 full time equivalent (FTE) jobs and generate approximately \$124 million in output (sales)

impacts and approximately \$53 million in income impacts per year to the U.S. economy. Among the jobs supported, 232 FTE jobs are estimated to be in the harvesting sector and 141 FTE jobs are in the dealer/processor sector. Approximately two-thirds of the jobs supported by these harvests are estimated to accrue to the restaurant sector. These estimates of economic activity 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 of employees in the direct and indirectly affected sectors).

In addition to red snapper harvests, as discussed above, the vessels that harvested red snapper also harvested other species on the trips where red snapper were harvested, as well as on other trips on which no red snapper were harvested. All revenues from all species on all these trips contributed towards making these vessels economically viable and contribute to the economic activity associated with these vessels. The average annual total ex-vessel revenues from all species (including red snapper) harvested during this period (2007-2008) by vessels that harvested red snapper was approximately \$29.94 million (2008 dollars). The economic activity associated with these revenues is estimated to support 5,643 FTE jobs (736 in the harvesting sector and 448 in the dealer/processor sector) and generate approximately \$394 million in output (sales) impacts and approximately \$168 million in income impacts. Caution should be used in interpretation of the estimates of harvester jobs, however, as these revenues were generated by the same vessels, likely using mostly the same crew. The estimate of jobs in the harvest sector are based roughly on the estimate that approximately \$40,000 in ex-vessel revenues in the commercial reef fish fishery supports, on average, one FTE harvester job. As a result of this methodology, increasing the amount of revenues uniformly increases the number of jobs supported and does not factor in the higher earnings potential of these vessels.

2.3.1.5 Imports

Information on the imports of all snapper and grouper species, either fresh or frozen, from 1993-2006 are provided in GMFMC (2009) and are incorporated herein by reference. Information on the imports of individual snapper or grouper species is not available. In 2007, imports of all snapper and grouper species rose to a historic high of approximately 52.21 MP valued at approximately \$117.37 million (2008 dollars), but declined to approximately 40.84 MP valued at approximately \$96.49 million in 2008 (NMFS 2009b). These amounts are contrasted with the domestic harvest of all reef fish in the Gulf of Mexico which peaked at approximately 20.5 MP in 2002 (GMFMC 2009). Although the levels of domestic production and imports are not totally comparable for a several reasons, including considerations of different product form, such as fresh versus frozen, and possible product mislabeling, the difference in the magnitude of imports relative to amount of domestic harvest, despite the decline in imports in 2008, is indicative of the dominance of imports in the domestic reef fish market.

2.3.2 Recreational Sector

Additional information on the Gulf of Mexico recreational red snapper sector and the recreational sector in general is provided in Reef Fish Amendment 25/Coastal Migratory Pelagics Amendment 17 (GMFMC 2005b), the 2005 recreational fishery grouper regulatory

amendment (GMFMC 2005c), and Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007) and is incorporated herein by reference.

2.3.2.1 Angler Effort

Recreational effort derived from the Marine Recreational Fisheries Statistics Survey/Marine Recreational Information Program database can be characterized in terms of the number of trips as follows:

1. Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or second primary target for the trip. The species did not have to be caught.
2. Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
3. Total recreational trips - The total estimated number of recreational trips in the South Atlantic, regardless of target intent or catch success.

Other measures of effort are possible, such as the number of harvest trips (the number of individual angler trips that harvest a particular species regardless of target intent), and directed trips (the number of individual angler trips that either targeted or caught a particular species), among other measures, but the three measures of effort listed above are used in this assessment. Estimates of red snapper effort and total marine recreational fishing effort in the Gulf are provided in Tables 2.3.2.1.1 – 2.3.2.1.3. Anglers in West Florida reported the highest target effort for red snapper from 2004-2008, followed by Alabama anglers, and private/rental boat anglers reported the highest number of target trips (Table 2.3.2.1.1). However, on a percentage basis, red snapper demand was greatest in the charter sector, accounting for approximately 11% of all charter trips (approximately 90,000 target trips out of 813,000 total trips), whereas only approximately 2% of private/rental boat trips reported targeting red snapper (approximately 277,000 trips out of 13.9 million total trips; Table 2.3.2.1.1).

Across all states and modes, the number of individual angler trips that caught red snapper during 2004-2008 was over twice the number of trips that targeted red snapper (Table 2.3.2.1.1). West Florida again led all Gulf states in the number of red snapper catch trips. While the private/rental boat mode was estimated to have the highest number of red snapper catch trips, similar to red snapper target trips, a much higher proportion of the red snapper catch trips occurred in the charter sector compared to red snapper target trips.

Table 2.3.2.1.2 contains the same information as Table 2.3.2.1.1 except the values reflect only 2008 activity. With respect to red snapper target or catch trips, across all modes, 2008 conditions were less than the 2004-2008 average in all states except for red snapper catch trips in West Florida. Also, while total charter trips in 2008 were higher than the multi-year average for West Florida through Louisiana, approximately 839,000 trips to 813,000 trips (for this comparison, Texas trips are not included because of the absence of target or catch information on Texas trips), charter red snapper catch trips accounted for a smaller portion of total red snapper

catch trips, approximately 38% (258,000 trips out of 687,000 trips), compared to an average of 44% (330,000 trips out of 750,000 trips) for 2004-2008.

Table 2.3.2.1.1. 2004-2008 average annual red snapper recreational effort.

	Alabama	West Florida	Louisiana	Mississippi	Texas	Total
	Shore Mode					
Target Trips	0	1,652	0	0	*	1,652
Catch Trips	1,198	1,546	0	0	*	2,744
All Trips	934,906	6,544,591	1,092,570	394,107	*	8,966,174
	Private/Rental Mode					
Target Trips	88,846	137,947	38,375	12,024	*	277,192
Catch Trips	105,091	249,508	51,022	12,056	*	417,677
All Trips	905,260	9,169,050	3,209,549	636,874	952,628	14,873,361
	Charter Mode					
Target Trips	22,083	47,133	20,849	33	*	90,098
Catch Trips	55,219	230,560	43,562	203	*	329,544
All Trips	67,887	581,760	151,688	11,946	139,360	952,641
	All Modes					
Target Trips	110,929	186,732	59,224	12,057	*	368,942
Catch Trips	161,508	481,614	94,584	12,259	*	749,965
All Trips	1,908,053	16,295,401	4,453,807	1,042,927	1,091,988	24,792,176

*Unavailable.

Source: Marine Recreational Fisheries Statistics Survey/Marine Recreational Information Program and Texas Parks and Wildlife data.

Table 2.3.2.1.2. 2008 red snapper recreational effort.

	Alabama	West Florida	Louisiana	Mississippi	Texas	Total
	Shore Mode					
Target Trips	0	0	0	0		0
Catch Trips	0	4,206	0	0		4,206
All Trips	666,381	6,716,020	949,993	363,027	*	8,695,421
	Private/Rental Mode					
Target Trips	44,519	132,288	35,774	3,157		215,738
Catch Trips	79,791	276,362	61,964	6,495		424,612
All Trips	948,880	9,616,596	3,416,042	592,528	906,498	15,480,544
	Charter Mode					
Target Trips	15,971	46,723	10,139	0		72,833
Catch Trips	34,883	201,761	20,983	378		258,005
All Trips	55,820	595,455	174,856	13,244	150,906	990,281
	All Modes					
Target Trips	60,490	179,011	45,913	3,157		288,571
Catch Trips	114,674	482,329	82,947	6,873		686,823
All Trips	1,671,081	16,928,071	4,540,891	968,799	1,057,404	25,166,246

*Unavailable.

Source: Marine Recreational Fisheries Statistics Survey and Texas Parks and Wildlife data.

Head boat data do not support the estimation of target or catch effort because target intent is not collected and harvest data (the data reflect only harvest information and not total catch) is collected on a vessel basis and not by individual angler. Table 2.3.2.1.3 provides estimates of the number of head boat angler days for all Gulf states from 2004 through 2008.

Table 2.3.2.1.3. Head boat angler days.

	WFlorida/Alabama	Louisiana	Texas	Total
2004	158,430	na*	64,990	223,420
2005	130,233	na	59,857	190,090
2006	124,049	5,005	70,789	199,843
2007	136,880	2,522	63,764	203,166
2008	130,176	2,945	41,188	174,309
Average	135,954	3,491	60,118	199,563

*na=not available.

Source: NMFS Head Boat Survey.

2.3.2.2 Economic Value

Economic value in the recreational sector is measured in terms of consumer surplus (CS) to anglers and producer surplus (PS) to charterboat and head boat operations. Consumer surplus is the amount of money that an angler would be willing-to-pay for a fishing trip over and above the cost of the trip. Producer surplus is the amount of money that the operator earns on the trip per angler over and above the cost of providing the trip. Because the PS is unknown, net operating revenue (NOR) is used as the proxy for PS, where NOR is defined as operating 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. A discussion of these variables and estimates of appropriate values are provided in Appendix A. In summary, the estimated CS for a red snapper trip is approximately \$54 (2008 dollars) and the estimated NOR is approximately \$148 and \$49 (2008 dollars) per charterboat and head boat angler trip, respectively.

2.3.2.3 For-Hire Vessels

The for-hire sector is comprised of charter vessels and head boats (party boats). Although charter vessels tend to be smaller, on average, than head boats, the key distinction between the two types of operations is that the fee charged on a charterboat trip is for the entire vessel, regardless of how many passengers are carried, whereas the fee charged for a head boat trip is paid per individual angler.

A federal for-hire vessel permit has been required for reef fish since 1996 and the sector currently operates under a limited access system (GMFMC 2005b). On December 23, 2009, there were 1,235 active Gulf reef fish for-hire permits. An active permit is a non-expired permit.

Expired reef fish for-hire permits may not be actively fished, but are renewable for up to one year after expiration. Because of the extended renewal period, numerous permits may be expired but renewable at any given time of the year, resulting in the total number of permits (and associated vessels) potentially active over the course of the entire calendar year being a few hundred more than the number of active permits on a given date. The majority of the 1,266 permits active on December 23, 2009, 759 permits, were registered with Florida addresses, followed by 206 permits with Texas addresses, 120 permits with Alabama addresses, 89 permits with Louisiana addresses, and 48 permits with Mississippi addresses (the registration address for the federal permit does not restrict operation to federal waters off that state; however, vessels would be subject to state permitting requirements, should such exist). Although the permit does not distinguish between head boats and charterboats, an estimated 79 head boats operate in the Gulf. The majority of these vessels, 43, operate from Florida ports, followed by 22 vessels in Texas, 10 vessels in Alabama, and 4 vessels in Louisiana.

Information on Gulf head boat and charterboat operating characteristics, including average fees and net operating revenues, are included in GMFMC (2007) and is incorporated herein by reference.

2.3.2.4 Economic Impacts

The value estimates provided in Section 2.3.2.2 should not be confused with angler expenditures or economic activity (impacts) associated with these expenditures. While expenditures for a specific good or service may represent a proxy or lower bound of value (a person would not logically pay more for something than it was worth to them), expenditures do not represent the net value of the good or service (benefit minus cost), nor the change in value associated with a change in the fishing experience.

Estimates of the economic activity (impacts) associated with recreational angling for red snapper were derived using average impact coefficients for recreational angling for all species, as derived from an add-on survey to the Marine Recreational Fisheries and Statistics Survey to collect economic expenditure information, and described and utilized in NMFS (2009c). Estimates of these coefficients for target or catch behavior for individual species are not available. Estimates of the average expenditures by recreational anglers are also provided in NMFS (2009c) and are incorporated herein by reference.

Estimates of the average red snapper effort (2004-2008) and associated economic activity (2008 dollars) are provided in Table 2.3.2.4.1. Red snapper target effort (trips) was selected as the measure of red snapper effort. More individual angler trips catch red snapper than target red snapper, however, as described in Tables 2.3.2.1.1 and 2.3.2.1.2. Estimates of the economic activity associated with red snapper catch trips can be calculated using the ratio of catch trips to target trips because the average impacts per trip are not differentiated by trip intent. For example, if the estimated number of catch trips is three times the number of target trips for a particular state and mode, the estimate of the economic activity associated with these catch trips would equal three times the estimated impacts of target trips. The total 2008 output (sales) impacts for all modes and states (excluding Texas) for trips which targeted red snapper was approximately \$51.2 million, the value added impact was approximately \$29.1 million, and the

economic activity associated with these trips supported an estimated 561 FTE jobs. Charter trips contributed the greatest portion of these impacts, accounting for approximately 70% of the total impacts. It should be noted that output impacts and value added impacts are not additive.

Table 2.3.2.4.1. Summary of red snapper target trips (2004-2008 average) and associated economic impacts (2008 dollars). Output and value added impacts are not additive.

	Alabama	West Florida	Louisiana	Mississippi	Texas*	Total**
	Shore Mode					
Target Trips	0	1,652	0	0		1,652
Output Impact	\$0	\$111,954	\$0	\$0		\$111,954
Value Added Impact	\$0	\$65,042	\$0	\$0		\$65,042
Jobs	0	1	0	0		1
	Private/Rental Mode					
Target Trips	88,846	137,947	38,375	12,024		277,192
Output Impact	\$5,169,185	\$6,262,981	\$3,129,427	\$342,905		\$14,904,499
Value Added Impact	\$2,830,012	\$3,724,204	\$1,539,161	\$164,344		\$8,257,721
Jobs	54	63	29	3		149
	Charter Mode					
Target Trips	22,083	47,133	20,849	33		90,098
Output Impact	\$11,497,543	\$14,800,075	\$9,925,204	\$10,253		\$36,233,076
Value Added Impact	\$6,329,013	\$8,774,921	\$5,635,513	\$5,778		\$20,745,224
Jobs	154	152	104	0		410
	All Modes					
Target Trips	110,929	186,732	59,224	12,057		368,942
Output Impact	\$16,666,729	\$21,175,011	\$13,054,631	\$353,158		\$51,249,529
Value Added Impact	\$9,159,024	\$12,564,167	\$7,174,675	\$170,122		\$29,067,987
Jobs	208	216	134	3		561

*Target information unavailable.

**Excluding the Texas (all modes) and Gulf-wide head boat sector.

Source: effort data from the Marine Recreational Fisheries Statistics Survey/Marine Recreational Information Program, economic impact results calculated by National Marine Fisheries Service Southeast Regional Office using the model developed for NMFS (2009c).

Estimates of the economic activity (impacts) associated with head boat red snapper effort are not available. The head boat sector in the Southeast is not covered in the MRFSS, so estimation of the appropriate economic impact coefficients for the head boat sector was not conducted in the development of NMFS (2009c). While appropriate economic impact coefficients are available for the charterboat sector, potential differences certain factors, such as the for-hire fee, rates of

tourist versus local participation rates, and expenditure patterns, may result in significant differences in the economic impacts of the head boat sector relative to the charterboat sector. The head boat (party boat) sector is included in the Marine Recreational Fisheries Statistical Survey in the mid-Atlantic and New England states and the estimated output (sales) impact per trip for charter and party boats combined for all mid-Atlantic states ranges from approximately \$140 to \$190 (2008 dollars), whereas the comparable value per charter trip across all Gulf states is estimated to exceed \$300 and is over \$475 for Alabama and Louisiana. The wide variation in these values suggests the importance of using values specific to the head boat sector, which are not available at this time. It should also be recalled, as discussed in Section 2.3.2.1, that species target information for the head boat sector is not available.

2.4 Social Environment

The demographic description of the social environment is presented at the county level and includes a brief discussion of the communities within in each county that are most reliant upon the red snapper resource both commercially and recreationally. Utilizing demographic data at the county level allows 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.² Estimates for smaller geographies are not available at this time. 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 and is used to address environmental justice concerns. A more detailed description of environmental justice concerns is included under Other Applicable Law Section 7.0, E.O. 12898.

The county-level description focused primarily on the demographic character of each county. The prevalent coastal growth and development affecting many coastal communities, especially those with either or both commercial and recreational working waterfronts, may be reflected in the demographic statistics. The rapid disappearance of these types of waterfronts has important implications for the disruption of various types of fishing-related businesses and employment. The process of “gentrification,” which tends to push those of a lower socio-economic class out of traditional communities as property values and taxes rise has become common along coastal areas of the U.S. and around the world. Working waterfronts tend to be displaced with development that is often stated as the “highest and best” use of waterfront property, but often is not associated with water-dependent occupations. However, with the continued removal of these types of businesses over time the local economy becomes less diverse and more reliant on the service sector and recreational tourism. As home values increase, people within lower socio-economic strata find it difficult to live within these communities and eventually must move. Consequently they 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 infrastructure as unappealing. They often do not see

² 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 2006 and December 2008 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 linkage between those occupations and the aesthetics of the community that produced the initial appeal for many migrants. The demographic trends within counties can provide some indication as to whether these types of coastal change may be occurring if an unusually high rate of growth or change in the demographic character of the population is present. A rise in education levels, property values, fewer owner occupied properties and an increase in the median age can at times indicate a growing process of gentrification.

Although the most recent estimates of census data have been used here, many of the statistics related to the economic condition of counties or communities do not capture the 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 an average for 2006 - 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 for the commercial sector and charter services and other support services for the recreational fishery. These may not be reflected in the demographic profile provided here.

Commercial Fishing Communities

The commercial red snapper fishery is prosecuted throughout the Gulf region with the majority of landings occurring in the Northern Gulf. While landing sites extend as far south as Key West, Florida and Port Isabel, Texas (Figure 2.4.1), the top three communities in terms of commercial landings are Galveston, Texas, Destin, Florida and Golden Meadow, Louisiana according to Table 2.4.1.



Figure 2.4.1. Red snapper Individual Fishing Quota landing sites by frequency of sites identified within a community.

Though the above mentioned three communities are at the top in terms of pounds landed, Grand Bay, Alabama, Matagorda, Texas and Destin, Florida represent the top three communities with the largest percentage of red snapper landings out of each community's total landings. Table 2.4.1 provides a ranking on several landings variables for the top 25 communities in terms of average rank. These communities represent those that are the most reliant upon red snapper landings in terms of both landings and value.

Table 2.4.1. Average community rank by pounds of commercial red snapper landed and percentage of total landings and value for 2008 (ALS SEFSC 2009).

State	Community	Rank in Pounds	Pounds/Total	Rank in Pounds/Total	Value/Total	Rank in Value/Total	Average Rank
FL	Destin	2	12.4%	3	22.6%	4	3
AL	Grand Bay	8	57.6%	1	70.2%	1	3
TX	Matagorda	9	37.9%	2	38.3%	2	4
TX	Galveston	1	7.5%	8	10.3%	11	7
LA	Golden Meadow	3	5.8%	10	14.2%	9	7
FL	Pensacola	11	8.5%	6	15.5%	7	8
FL	Panama City	4	6.6%	9	7.1%	13	9
MS	Pascagoula	12	5.3%	11	24.7%	3	9
TX	Houston	18	8.0%	7	19.4%	5	10
FL	Fort Walton Beach	19	9.5%	5	18.0%	6	10
TX	Freeport	5	5.0%	13	4.6%	16	11
FL	Dunedin	29	11.5%	4	15.1%	8	14
AL	Theodore	17	2.7%	17	11.4%	10	15
TX	Port Bolivar	10	1.9%	18	3.0%	19	16
FL	Eastpoint	21	4.4%	14	7.1%	14	16
TX	Port Isabel	6	1.6%	19	1.2%	27	17
LA	Houma	13	1.2%	21	2.3%	20	18
LA	Grand Isle	7	0.7%	26	1.7%	22	18
FL	Clearwater	23	2.8%	16	3.3%	18	19
FL	Freeport	27	3.7%	15	5.3%	15	19
LA	Buras	16	1.6%	20	1.7%	23	20
FL	Valparaiso	37	5.2%	12	9.8%	12	20
LA	Venice	14	0.5%	29	1.4%	24	22
FL	Panacea	26	0.9%	24	1.9%	21	24
FL	Saint Petersburg	22	0.9%	25	1.3%	25	24
FL	Gulf Breeze	34	1.1%	22	3.5%	17	24
FL	Apalachicola	20	0.6%	27	1.1%	28	25

Recreational Fishing Communities

While there are no landings data at the community level for the recreational sector, Table 2.4.2 offers a ranking of communities based upon the number of charter permits and charter permits divided by population. The count includes both reef fish and coastal pelagic charter permits. This is a crude measure of the reliance upon recreational fishing and general in nature and not specific to red snapper. At this time it is impossible to examine the intensity of recreational fishing activity at the community level for a specific species. However, it is likely that those communities that have a higher rank in terms of charter activity and have a dynamic commercial fishery for red snapper will likely have a vigorous recreational red snapper fishery. The communities that meet those criteria are: Destin, FL; Freeport, TX; Venice, LA; Grand Isle, LA; Panama City, FL; and Panacea, FL.

Table 2.4.2. Average community rank by total number of charter permits by community* and population (SERO 2008).

Community	State	Charter Permits	Rank Charter Permits	Charter Permit/Pop	Rank Charter Permits/Pop	Average Rank
Orange Beach	AL	223	3	0.0358	6	5
Destin	FL	234	2	0.0186	16	9
Islamorada	FL	132	5	0.0209	14	10
Port Aransas	TX	96	8	0.0250	11	10
Key West	FL	368	1	0.0165	22	12
Steinhatchee	FL	44	23	0.0307	7	15
Dauphin Island	AL	44	23	0.0277	9	16
Apalachicola	FL	45	21	0.0204	15	18
Marathon	FL	112	6	0.0118	31	19
Port O'Connor	TX	33	35	0.0306	8	22
Tavernier	FL	35	32	0.0161	23	28
Freeport	TX	78	10	0.0062	46	28
Carrabelle	FL	30	43	0.0244	13	28
Cudjoe Key	FL	31	42	0.0183	19	31
Venice	LA	20	60	0.0862	2	31
Grand Isle	LA	27	44	0.0167	21	33
Panama City	FL	159	4	0.0043	62	33
Panama City Beach	FL	77	11	0.0053	55	33
Port Saint Joe	FL	27	44	0.0076	39	42
Cedar Key	FL	18	68	0.0184	17	43
Saint Marks	FL	13	81	0.0408	4	43
Panacea	FL	20	60	0.0116	32	46
Marco Island	FL	46	20	0.0029	74	47
Matagorda	TX	14	78	0.0184	18	48
Madeira Beach	FL	25	49	0.0058	51	50

* Total number of charter permits does not correspond to number of vessels; a vessel may have several different types of charter permits.

Florida

The demographic profile for Florida counties (Table 2.4.3) suggests, for the most part, a somewhat densely populated coast and older population. Wakulla County has the lowest population density and has a large portion of its land in the Apalachicola National forest; it is still very rural in nature in contrast to many other parts of the Florida coast. Okaloosa County has a rather small number of people per square mile; however the county contains numerous federal lands that are unpopulated except for military bases. The barrier islands in that county have a much more dense population base.

Table 2.4.3. Census Demographic Estimates for Counties in Florida (U.S. Census Bureau 2009)

Factor	Escambia Co	Okaloosa Co	Bay Co	Wakulla Co
Total population	304,280	181,205	163,805	30,092
Population Density (Persons per sq. mi.)*	466.7	195.1	216.2	49.0
Median Age	37.8	39.0	39.4	38.6
Percent under 5 years of age	6.7	7.2	6.9	5.3
Percent 65 years and older	14.6	13.3	14.3	12.5
Ethnicity or Race (Percent/one or more races)				
White	73.4	85.1	85.4	85.9
Black or African American	23.1	10.8	12.1	13.3
American Indian and Alaskan Native	2.5	1.4	1.7	1.4
Asian	3.2	4.1	2.6	0.8
Hispanic or Latino (any race)	3.6	5.7	3.5	3.0
Non-Hispanic (White alone)	68.6	78.3	80.4	81.9
Educational Attainment (Population 25 and over)				
Percent with less than 9th grade	3.7	2.6	4.1	3.6
Percent high school graduate or higher	86.0	91.0	86.3	83.0
Percent with a Bachelor's degree / higher	23.5	27.9	20.9	14.7
Household income (Median \$)	43,311	57,11	48,516	53,595
Poverty Status (Percent Pop below poverty line)	15.2	8.9	11.7	13.4
Owner Occupied Housing (Percent)	68.9	67.4	66.2	83.0
Value Owner-occupied Housing (Median \$)	145,700	166,700	182,300	142,300
Civilian Labor Force Unemployed (% 16 yrs & over)	8.0	4.4	5.6	6.1
Occupation (Percent)				
Management, professional, and related	31.2	36.9	32.4	28.4
Service	20.0	18.8	18.5	18.2
Sales and office	27.8	24.6	27.6	28.3
Farming, fishing, and forestry	0.2	0.3	0.2	0.1
Construction, extraction, and maintenance	11.3	11.9	12.6	16.2
Production, transportation, and material moving	9.5	7.5	8.7	8.9
Industry and Class of Worker (Percent)				
Agriculture, forestry, fishing and hunting	0.6	0.4	0.5	0.7
Arts, entertainment, recreation, accomm, food services	10.0	11.0	10.8	4.4
Percent government workers	16.7	20.3	18.5	27.9
Self-employed workers	6.6	5.6	6.3	6.7

The Panhandle communities of Destin, Pensacola, Panama City and Ft. Walton Beach are the more reliant communities in terms of commercial landings. Yet as shown in Table 2.4.3, employment in the farming, fishing and forestry makes up a very small portion of occupations within these counties. These communities are densely populated coastal communities that rely on recreational tourism for a large part of their economies as some of the top rated beaches in the nation are located here. Destin and Panama City are likely more reliant with regard to recreational fishing as they have numerous charter operations. When visiting charter service websites from these two communities, photos of red snapper are very prominent and advertized

as a key target species (<http://www.fishdestin.com/fishinggallery.html>; and <http://www.jubileefishing.com/>). Panacea is less reliant upon red snapper and located in a more rural area than the other communities. In terms of occupation it has the lowest percentage in farming, forestry and fishing, yet it does have the largest percentage class of worker in that category. All of these communities are considered to be primarily involved in fishing based upon their community profiles (Impact Assessment, Inc 2005).

Alabama and Mississippi

The fishing communities in Alabama and Mississippi that are most reliant upon red snapper are located in Mobile and Jackson County respectively. Mobile County has a higher population density and a lower average age than either Jackson County or the State of Alabama. Jackson County's average age is higher than the State of Mississippi average of 35. Mobile County has a higher percentage of minorities and a higher level of poverty than Jackson County.

Communities in Alabama and Mississippi that have important ties to red snapper are Grand Bay, Alabama and Pascagoula, Mississippi in terms of commercial fishing. Grand Bay ranks at the top in terms of proportion of pounds and value to total landings. Orange Beach, Alabama which ranks high in terms of charter permits sponsors a red snapper fishing tournament in March at a local marina (<http://www.orangebeachmarina.com/tournaments.htm>). Dauphin Island, Alabama also has a number of charter services that specialize in bottom fishing, especially for red snapper (<http://gulfinfo.com/fishing.htm>). All three Alabama communities are considered primarily involved in fishing as noted in the profiles of fishing communities for both states (Impact Assessment, Inc., 2006). Red snapper fishing is featured at Pascagoula charter websites (<http://www.jkocharters.com/1938863.html>) and the community ranks number three with regard to value of red snapper landings out of total commercial landings. Pascagoula is regarded as primarily involved in fishing according to its community profile (Impact Assessment, Inc., 2006).

Table 2.4.4. Census Demographics Estimates for Counties in Alabama and Mississippi (Source: U.S. Census Bureau 2009).

Factor	Mobile Co AL	Jackson Co MS
Total population	404,012	129,619
Population Density (Persons per sq. mi.)*	328.9	180.0
Median Age	36.0	37.1
Percent under 5 years of age	7.3	7.1
Percent 65 years and older	12.3	11.6
Ethnicity or Race (Percent/one or more races)		
White	62.8	74.4
Black or African American	34.5	22.9
American Indian and Alaskan Native	1.2	0.8
Asian	2.0	2.2
Hispanic or Latino (any race)	1.8	3.4
Non-Hispanic (White alone)	60.6	71.0
Educational Attainment (Population 25 and over)		
Percent with less than 9th grade	4.9	4.3
Percent high school graduate or higher	82.1	84.0
Percent with a Bachelor's degree or higher	19.6	18.0
Household income (Median \$)	54,729	47,934
Poverty Status (Percent of population below poverty line)	19.4	14.7
Owner Occupied Housing (Percent)	68.9	72.3
Value Owner-occupied Housing (Median \$)	115,400	123,800
Percent of Civilian Labor Force Unemployed (16 yrs and over)	4.4	5.3
Occupation (Percent)		
Management, professional, and related	29.8	30.8
Service	16.5	17.9
Sales and office	27.1	23.5
Farming, fishing, and forestry	0.7	0.2
Construction, extraction, and maintenance	12.5	14.6
Production, transportation, and material moving	13.4	12.9
Industry and Class of Worker (Percent)		
Agriculture, forestry, fishing and hunting	1.1	0.9
Arts, entertainment, recreation, accommodation, food services	7.7	13.2
Percent government workers	14.4	16.3
Self-employed workers	4.9	5.5

Louisiana

Communities in Louisiana that are reliant upon red snapper are located in three parishes: La Fourche, Plaquemine and Jefferson. All three counties have a relatively low population density with Jefferson County having the highest population of the three. The communities of Golden Meadow, Houma, Venice, Buras and Grand Isle are all ranked in Table 2.4.1 with commercial red snapper landings within the top 25 communities. Venice and Grand Isle are also ranked as recreational communities within the top 25. A sampling of charter service websites from these communities indicates they do feature red snapper as a target species but not as prominently as charter services from other states.

Table 2.4.5. Census Demographics Estimates for Parishes in Louisiana (Source: U.S. Census Bureau 2009).

Factor	La Fourche Parish	Plaquemine Parish	Jefferson Parish
Total population	92,684	21,494	432,914
Population Density (Persons per sq. mi.)*	85.5	26.8	47.9
Median Age	36.1	37.4	39.4
Percent under 5 years of age	6.3	7.3	6.4
Percent 65 years and older	12.1	11.5	13.7
Ethnicity or Race (Percent/one or more races)			
White	82.30	71.70	66.30
Black or African American	14.10	24.30	27.10
American Indian and Alaskan Native	3.00	3.10	0.90
Asian	0.50	N	4.10
Hispanic or Latino (any race)	2.1	N	9.0
Non-Hispanic (White alone)	80.1	N	59.5
Educational Attainment (Population 25 and over)			
Percent with less than 9th grade	15.3	5.2	7.2
Percent high school graduate or higher	70.1	80.1	81.5
Percent with a Bachelor's degree or higher	13.6	18.2	22.4
Household income (Median \$)	58,911	64,362	65,981
Poverty Status (Percent of population below poverty line)	17.5	11.2	14.0
Owner Occupied Housing (Percent)	75.6	68.1	65.9
Value Owner-occupied Housing (Median \$)	107,800	190,300	174,900
Civilian Labor Force Unemployed (% 16 yrs and over)	3.7	7.3	6.1
Occupation (Percent)			
Management, professional, and related	25.90	N	31.00
Service	14.60	N	17.10
Sales and office	24.20	N	28.20
Farming, fishing, and forestry	0.70	N	0.20
Construction, extraction, and maintenance	14.50	N	12.70
Production, transportation, and material moving	20.10	N	10.80
Industry and Class of Worker (Percent)			
Agriculture, forestry, fishing and hunting	9.0	5.8	1.6
Arts, entertainment, recreation, accommodation, food service	6.7	5.1	11.0
Percent government workers	15.0	28.6	11.8
Self-employed workers	7.0	8.2	6.4

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

The communities in Louisiana are relatively rural in nature with low population densities compared to other counties and states. The number of minorities and poverty status in all three counties do not exceed the thresholds for environmental justice concerns; however, these areas are likely still in the recovery process from the hurricane season of 2005. As of August, 2009 there were 1,768 households still residing in temporary housing as a result of the hurricanes, yet almost half of these households were planning on moving into permanent housing. Of those

originally in FEMA housing, 99% have moved into permanent housing (FEMA 2009). Some of the low unemployment rates for Louisiana have been a result of the rebuilding activity that has followed. The communities of Venice, Golden Meadow and Houma are all listed as Primarily-Involved in fishing according to their communities profiles; Buras and Grand Isle are listed as Secondly-Involved (Impact Assessment, 2005a).

Table 2.4.6. Census Demographics Estimates for Texas Counties (Source: U.S. Census Bureau 2009).

Factor	Brazoria Co	Galveston Co	Harris Co	Matagorda Co
Total population	292,613	283,361	3,918,326	37,039
Population Density (Persons per sq. mi.)*	216.7	750.5	2,309.9	33.6
Median Age	33.7	36.2	32.7	36.8
Percent under 5 years of age	8.1	7.3	8.8	7.4
Percent 65 years and older	9.1	10.8	7.8	13.8
Ethnicity or Race (Percent/one or more races)				
White	77.7	77.6	61.0	76.7
Black or African American	11.3	14.8	18.9	11.9
American Indian and Alaskan Native	1.0	1.4	0.8	1.4
Asian	4.6	3.0	5.9	2.3
Hispanic or Latino (any race)	25.9	21.0	38.4	36.2
Non-Hispanic (White alone)	57.6	60.4	36.6	48.3
Educational Attainment (Population 25 and over)				
Percent with less than 9th grade	7.4	5.9	12.2	12.9
Percent high school graduate or higher	83.8	85.5	77.1	74.4
Percent with a Bachelor's degree or higher	25.1	25.7	27.4	15.0
Household income (Median \$)	62,569	55,995	51,718	41,911
Poverty Status (Percent Pop below poverty line)	10.3	13.1	16.0	21.4
Owner Occupied Housing (Percent)	74.8	67.0	58.7	70.9
Value Owner-occupied Housing (Median \$)	134,700	137,000	131,500	77,400
Civilian Labor Force Unemployed (% 16 yrs and over)	3.0	3.8	4.4	5.9
Occupation (Percent)				
Management, professional, and related	36.5	37.3	32.8	28.1
Service	13.7	17.2	16.1	16.7
Sales and office	23.4	23.3	25.2	20.3
Farming, fishing, and forestry	0.4	0.3	0.1	2.4
Construction, extraction, and maintenance	13.2	10.5	12.5	16.2
Production, transportation, and material moving	12.8	11.5	13.3	16.3
Industry and Class of Worker (Percent)				
Agriculture, forestry, fishing and hunting	2.8	1.5	2.7	11.2
Arts, entertainment, recreation, accomm, food services	6.4	10.4	8.0	7.8
Percent government workers	14.2	19.5	10.6	15.6
Self-employed workers	5.8	6.1	7.1	9.8

Texas

Communities in Texas that rely on red snapper are in the four coastal counties of Brazoria, Galveston, Harris and Matagorda. Houston is the largest city in the state and located in Harris County which accounts for the high population density. Houston is listed as tangentially involved in fishing (Impact Assessment, Inc. 2005b), although it does rank within the top ten of communities in terms of value of red snapper landings to total landings. In terms of commercial fishing, red snapper are an important part of the overall landings of Galveston as it ranks first in total landings in 2008 (Table 2.4.1) while Freeport ranks fifth. Red snapper are also an important species for charter fishing in Galveston and Freeport. Many of the charter services include photos of red snapper catches on their website and note that this species is one of their prime target species (<http://www.texassaltwaterfishingguide.com/> or <http://www.matagordabay.com/>). Although many inshore species like trout and redfish are more prominently displayed. Matagorda and Freeport are noted as being primarily involved in fishing while Galveston is secondarily involved.

2.5 Administrative Environment

2.5.1 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, 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 Exclusive Economic Zone.

Responsibility for federal fishery management decision-making is divided between the 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 10. In most cases, the Secretary has delegated this authority to National Marine Fisheries Service.

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 National Marine Fisheries Service. The public is also involved in the fishery management process through participation on advisory panels and through council meetings that, with few exceptions for discussing personnel matters, are open to the public. The regulatory process is also in accordance with the Administrative Procedures Act, in the form of “notice and comment” rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations contained within FMPs are enforced through actions of the NOAA’s Office of Law Enforcement, the United States Coast Guard, 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 5-year “GOM Cooperative Law Enforcement Strategic Plan - 2006-2011.”

2.5.2 State Fishery Management

The purpose of state representation at the council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries. 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).

3 MANAGEMENT ALTERNATIVES

3.1 Action 1: Set Red Snapper Total Allowable Catch

Alternative 1: No Action - Maintain total allowable catch* as defined in the Red Snapper Rebuilding Plan included in Amendment 27/14. Total allowable catch would be 5.0 million pounds (MP). Based on the 51%:49% commercial and recreational allocation of red snapper, the commercial and recreational quotas would be 2.55 and 2.45 MP, respectively.

Preferred Alternative 2: Set total allowable catch using the Scientific and Statistical Committee's acceptable biological catch recommendation, which is 75% of the overfishing limit defined in the 2009 red snapper stock assessment update. Total allowable catch would be 6.945 MP. Based on the 51%:49% commercial and recreational allocation of red snapper, the commercial and recreational quotas would be 3.542 and 3.403 MP, respectively.

Alternative 3: Set total allowable catch based on 65% of the overfishing limit defined in the 2009 red snapper stock assessment update. Total allowable catch would be 6.019 MP. Based on the 51%:49% commercial and recreational allocation of red snapper, the commercial and recreational quotas would be 3.070 and 2.949 MP, respectively.

Note: * Total allowable catch is equivalent to a stock annual catch limit.

Discussion and Rationale:

This action proposes alternatives to consider an increase of total allowable catch (stock annual catch limit) of red snapper and make the resulting recreational and commercial quotas consistent with the goals and objectives of the Red Snapper Rebuilding Plan while achieving the mandates of the Magnuson-Stevens Act. In Amendment 27/14 the Council set total allowable catch for red snapper at 5.0 MP until the 2009 red snapper update assessment was complete. Under this harvest restriction and revised rebuilding plan, there was greater than a 50% probability of ending overfishing and rebuilding the stock to biomass at maximum sustainable yield (B_{MSY}) by 2032. Based on the 2009 red snapper update assessment the management goals have been achieved. Even though the fishery is still overfished, the stock is rebuilding, and all three alternatives would result in a fishing rate below fishing mortality at maximum sustainable yield F_{MSY} (i.e., not overfishing). These alternatives are also within the Red Snapper Rebuilding Plan outlined in Amendment 27/14 (GMFMC 2007).

It should also be noted that current red snapper management is consistent with the provisions of the Magnuson-Stevens Act as reauthorized in 2006. The fishery has sector specific quotas that act as annual catch limits and accountability measures are in place to prevent or limit the likelihood that the annual catch limits are exceeded. For the commercial fishery, an individual fishing quota program has been implemented where fishermen are granted a percentage of the red snapper quota based on their historical participation in the fishery. Individual fishing quota

landings are closely monitored to ensure the commercial quota or sector annual catch limit is not exceeded. For the recreational fishery, the ability to limit the fishing season each year based on the projected harvest acts as an accountability measure.

Alternative 1, no action, would maintain total allowable catch at 5.0 MP as defined in the Red Snapper Rebuilding Plan, Amendment 27/14. Based on the current commercial and recreational allocation, the quotas would be 2.55 and 2.45 MP, respectively. This alternative would set the total allowable catch based on F_{rebuild} established in Amendment 27/14, which is below the optimum yield (F_{OY}) defined in the 2009 red snapper update assessment as $F_{\text{OY}} = 7.08$ MP for 2010. Based on the status of the red snapper stock and the Scientific and Statistical Committee's recommendation of acceptable biological catch, this alternative might be unnecessarily restrictive. The commercial fishery is under an individual fishing quota system and thus far has maintained landings within their quota. Under this alternative the projected recreational fishing season using preliminary information would range between 34 and 40 days before the quota is met. During the 2008 and 2009 fishing seasons, the National Marine Fisheries Service conducted an analysis to project when red snapper recreational landings would meet their quota during the June 1 through September 30 fishing season. In 2008 and 2009, the recreational quota was projected by National Marine Fisheries Service to be met in August, so the recreational fishery closed before the September 30 end date. A similar analysis will be completed for the 2010 recreational red snapper season once 2009 landings data are finalized. The estimated 2010 fishing season under the 5.0 MP total allowable catch is shorter than the 2009 recreational red snapper fishing season because the recreational sector overharvested its allocation by 75% under the 75 day season in 2009. There is no payback provision for overharvest in the Red Snapper Rebuilding Plan, but a shorter season is needed to keep the recreational sector from overharvesting its allocation again in 2010.

Preferred Alternative 2 would set total allowable catch for 2010 at 6.945 MP, which is 75% of the overfishing limit defined in the 2009 red snapper stock assessment update. Based on the current commercial and recreational allocations, the quotas would be 3.542 and 3.403 MP, respectively. The Scientific and Statistical Committee recommended an acceptable biological catch of 6.945 MP for 2010, 25% below the overfishing limit to account for scientific uncertainty. The Council selected **Alternative 2** as the preferred total allowable catch in accordance with the Scientific and Statistical Committee's recommendation of acceptable biological catch. The Scientific and Statistical Committee's recommendation took into account the status of the red snapper stock as well as scientific uncertainty. The commercial fishery is under an individual fishing quota system and thus far has maintained landings within their quota. Under this alternative the projected recreational fishing season would range between 51 and 60 days before the quota is met. **Preferred Alternative 2** would increase the pounds that can be harvested by the recreational sector, but not increase the number of fishing days compared to the 75 day recreational fishing season in 2009. This reduced 2010 season would be necessary to avoid overharvest even with the increase in total allowable catch. As with **Alternative 1**, the actual season length would be determined once finalized 2009 recreational landings data is available.

Alternative 3 would set total allowable catch for 2010 at 6.019 MP, which is 65% of the overfishing limit defined in the 2009 red snapper stock assessment update. Based on the current

commercial and recreational allocation, the quotas would be 3.070 and 2.949 MP, respectively. Under this alternative total allowable catch would be set 35% below the overfishing limit, a 10% greater buffer than what the Scientific and Statistical Committee recommended from the 2009 update assessment. The commercial fishery is under an individual fishing quota system and thus far has maintained landings within their quota. Under this alternative the projected 2010 recreational fishing season would range between 43 and 51 days before the quota is met. An analysis to finalize the number of days the 2010 fishing season would be estimated once 2009 recreational landings data are finalized.

Alternative 1 sets the total allowable catch at status quo, which does not take into account the status of the red snapper stock. It is a 28% reduction in total allowable catch compared to **Preferred Alternative 2** and a 17% reduction compared to **Alternative 3**. All three alternatives set the annual catch limit by sector, and if the annual catch limit for a sector is exceeded, then that sector's accountability measures would be triggered. These accountability measures could be in-season or post-season measures to prevent future quota overages. The recreational fishing season would be the shortest if **Alternative 1** was selected and would range from a 17-20 day difference in fishing days compared to **Preferred Alternative 2**. The recreational fishing season could be anywhere from 8-17 days shorter under **Alternative 3** compared to **Preferred Alternative 1**.

All of the alternatives would result in a fishing rate below fishing mortality at maximum sustainable yield F_{MSY} (i.e., not overfishing). **Preferred Alternative 2** would harvest the red snapper fishery within the 2009 update assessment definition of optimum yield ($F_{OY}=7.08$ MP in 2010). The National Standard 1 Guidelines state "conservation and management measures must prevent overfishing while achieving, on a continuing basis, the optimum yield. This is inherently challenging because preventing overfishing requires that harvest of fish be limited, while achieving optimum yield requires that harvest of fish occur." **Preferred Alternative 2** achieves the goals of the Council's rebuilding plan which is consistent with the reauthorized Magnuson-Steven Act and National Standard 1 Guidelines, based on the 2009 red snapper update assessment and the Scientific and Statistical Committee's recommendation.

3.2 Environmental Consequences

3.2.1 Direct and Indirect Effects on Physical Environment

Direct and indirect effects on the physical environment by the red snapper fishery have been discussed in detail in Amendments 22 and 27/14 (GMFMC 2004a and 2007) and are incorporated here by reference. The alternatives to change the harvest limits would not directly affect the physical environment. However, specifying total allowable catch could indirectly affect the physical environment by defining the level (i.e., the amount of gear in the water at any given time) of fishing effort and the duration and level of recreational fishing effort over the course of the fishing season. The commercial fishery is operating under an individual fishing quota system resulting in no quota closure. Thus, while the total allowable catch may affect the level of commercial fishing effort, the commercial fishing season will be open year-round regardless of the total allowable catch. Level and duration of effort together define the total

cumulative amount of effort (i.e., gear-hours of soak time), which affects the potential for gear to impact the physical environment.

The primary gears used in the commercial and recreational sectors are vertical line gear (bandit and hook-and-line). Some commercial landings are from bottom longlines, but this component of the commercial sector lands only a low percent of the total commercial fishery (SEDAR 7 2005). Vertical line gear has the potential to snag and entangle bottom structures. Each individual gear has a very small footprint and thus only a small potential for impact, but the cumulative impact of the commercial and recreational fishing sector results in a large amount of gear being placed in the water, increasing the potential for impact. The line and weights used by this gear type also can cause abrasions (Barnette 2001). Additionally, vertical line vessels often anchor when fishing, adding to the potential damage of the bottom at fishing locations. Bottom longlines have the potential to break or move hard structures on the sea floor, including rocks, corals, sponges, other invertebrates, and algae, when the line sweeps the bottom (Barnette 2001). If vertical and longline gear are not removed, long-term indirect effects to habitat may occur if marine life becomes entangled or overgrown with algae (Hamilton 2000; Barnette 2001). Circle hooks are required in the reef fish fishery. Because of the design of circle hooks, this gear is less likely to snag bottom habitat than other hook types.

Alternative 1 (no action) would maintain the 5.0 MP total allowable catch, and result in no changes to the commercial or recreational quotas. Therefore, this alternative should have no additional effects on the physical environment. **Preferred Alternative 2** and **Alternative 3** would allow the total allowable catch to increase to 6.945 MP and 6.019 MP, respectively. These alternatives would be expected to have the greater impacts on the physical environment when compared with **Alternative 1**, because they would allow for the greatest levels of fishing effort and most opportunities for gear interactions with habitat. However, any increases indirect effects on the physical environment are expected to be small because a large portion of the catch is taken from artificial structures (i.e., artificial reefs, oil and gas platforms), the primary gear used is hook-and-line, and the directed red snapper fishery represents only a small portion of the overall reef fish fishery in the Gulf of Mexico (SEDAR 7 2005). Also, several habitat areas of particular concern, marine sanctuaries, and marine reserves already exist in the Gulf where red snapper occur, providing additional protection to habitat and reducing impacts to the physical environment.

3.2.2 Direct and Indirect Effects on Biological/Ecological Environment

Red snapper demonstrate the typical life history pattern for managed reef fish species as summarized in Section 2.2, Amendment 22 (GMFMC 2004a), and GMFMC (2004b). In general, both eggs and larval stages are planktonic. Juvenile and adult red snapper are typically demersal and are usually associated with hard bottom.

Since the late 1980s, red snapper has been considered overfished and undergoing overfishing. Management efforts to rebuild the red snapper stock have been conducted since 1990. The current rebuilding plan for red snapper was approved in 2005 (Amendment 22) and revised in 2007 through Amendment 27/14. This 31-year rebuilding plan would have the stock recover in 2032. The most recent assessment update on the status of red snapper occurred in 2009 (SEDAR 7 update 2009) and is described in Section 2.2.1. The assessment has shown the stock is

improving and that overfishing was projected to have ended in 2009. As stated in the Purpose and Need, the recovery of the stock was projected to be sufficient to allow total allowable catch to increase.

Effects on the biological environment because of changes in total allowable catch have been discussed in detail in Amendments 22 and 27/14 and are incorporated here by reference. Direct effects of all three alternatives would allow the stock to recover consistent with the rebuilding plan. Any future increases in total allowable catch would also need to be consistent with this plan. **Alternative 1**, because it has the lowest total allowable catch, may allow the stock to recover more quickly than **Preferred Alternative 2** and **Alternative 3**. **Alternative 1** would also provide the greatest protection from overfishing should the stock projections be over optimistic or should some change occur in the stock that lowers its productivity, such as an episodic mortality event or natural disturbance. **Preferred Alternative 2** may slow recovery of red snapper compared to **Alternative 1**, but is still less than the maximum level that would still allow the stock to recover by 2032 (Section 2.2, SEDAR 7 update 2009). **Alternative 3** is intermediate to the other two alternatives, and so any effects on the biological environment would be somewhere in between **Alternative 1** and **Preferred Alternative 2**.

Indirect effects of these alternatives on the biological and ecological environment are not well understood. Changes in the population size structure as a result of shifting the fishing selectivities and increases in stock abundance could lead to changes in the abundance of other reef fish species that compete with red snapper for shelter and food. Predators of red snapper could increase if red snapper abundance is increased, while species competing for similar resources as red snapper could potentially decrease in abundance if less food and/or shelter are less available. Species likely to be affected by changes in red snapper abundance the most include: vermilion snapper, gray triggerfish, and gag, which all co-occur with red snapper. These effects are explored in more detail in Amendment 27/14.

3.2.3 Direct and Indirect Effects on the Economic Environment

3.2.3.1 Effects on the Commercial Sector

The approach adopted in this regulatory amendment assesses the economic effects on the commercial sector of the proposed alternatives by evaluating expected changes in annual gross revenues from commercial red snapper harvests. The total change in gross ex-vessel revenues used in this analysis are obtained by subtracting legally required cost recovery fees from the ex-vessel value of the expected red snapper harvest. Under the individual fishing quota program, fishermen are required to pay 3% of the ex-vessel value of red snapper harvested to defray management costs. Total ex-vessel values were calculated by multiplying commercial annual catch limits by an average ex-vessel price. The estimated average Gulf-wide ex-vessel price was \$3.76 per pound of red snapper (gutted weight) in 2008, as derived from the National Marine Fisheries Statistics website data (<http://www.st.nmfs.noaa.gov/st1/commercial/index.html>). Table 3.2.3.1.1 provides commercial annual catch limits, ex-vessel values, gross revenues, and expected changes in gross revenues for each of the alternatives considered.

Alternative 1 would maintain the current commercial red snapper annual catch limit and, as a result, would not be expected to result in any change in total ex-vessel value received from red snapper harvests. Under **Alternative 1**, the annual ex-vessel value of red snapper harvested under the individual fishing quota program is estimated at \$8.64 million (2008 dollars) for 2010.

Table 3.2.3.1.1: Commercial annual catch limits (ACLs), ex-vessel values, and gross revenues under alternative red snapper total allowable catches (TACs) - 2010

	TAC million lbs (whole weight)	Commercial ACL million lbs (gutted weight)	Ex vessel Value (\$ million)	Changes in Ex Vessel Value (\$ million)	Changes in Gross Revenues (\$ million)
Alternative 1	5.000	2.297	\$8.642		
Preferred Alternative 2	6.945	3.191	\$12.004	\$3.362	\$3.261
Alternative 3	6.019	2.766	\$10.403	\$1.761	\$1.708

Preferred Alternative 2 would increase the commercial red snapper annual catch limit to approximately 3.19 million pounds. The ex-vessel value of red snapper harvests under **Preferred Alternative 2** is estimated at approximately \$12.0 million. Relative to **Alternative 1**, the changes in ex-vessel value and in gross revenues expected from the implementation of **Preferred Alternative 2** are estimated at approximately \$3.36 million and \$3.26 million, respectively.

Alternative 3 would increase the commercial red snapper annual catch limit to approximately 2.76 mp, resulting in an estimated ex-vessel value of approximately \$10.4 million. Relative to **Alternative 1**, the expected changes in ex-vessel value and in gross revenues anticipated under **Alternative 3** are estimated at approximately \$1.76 million and \$1.70 million, respectively.

Based on the approach presented in this section, it logically follows that **Preferred Alternative 2**, which corresponds to the largest commercial annual catch limit, is expected to be associated with the greatest increase in gross revenues. While changes in gross revenue estimates are sufficient to provide an ordinal ranking of the alternatives, the supporting economic analysis does not account for several factors. The analysis does not include economic effects that could result from potential behavioral changes by individual fishing quota participants. For example, the effects of increases in commercial annual catch limit on the number and length of fishing trips and on crew size are not included. Fishermen may or may not elect to adjust the number of fishing trips in response to an annual catch limit increase. In addition, although red snapper individual fishing quota participants prosecute red snapper as a part of a multi-species reef fish fishery, the analysis does not account for possible changes in targeting behavior, which could result in harvests with different species composition. These effects could impact gross revenues as well as the operating costs of individual fishing quota participants. Potential behavioral changes were omitted due to data limitations. Economic effects expected from these behavioral

changes could conceivably be approximated if data on changes in trip structure, harvest composition, and operating costs resulting from a change in annual catch limit were available. However, such information is currently unavailable mainly due to the relatively recent implementation of the red snapper individual fishing quota program. If implemented, some of the management alternatives considered in this regulatory amendment (**Preferred Alternative 2 or Alternative 3**) would constitute the first increase in commercial annual catch limit under the red snapper individual fishing quota program.

3.2.3.2 Effects on the Recreational Sector

A discussion of the methodology and results of the analysis conducted to estimate the effects of the proposed alternatives on the recreational sector is provided in Appendix A and is incorporated herein by reference. The following provides a summary of these results.

Estimates of the expected economic effects of the proposed alternatives on the recreational sector are provided in Tables 3.2.4. **Preferred Alternative 2** is estimated to result in approximately 69,800-71,900 more red snapper target trips across all modes than **Alternative 1** under the alternative assumptions of possible changes (0-15%) in the average weight per red snapper harvested (Table 3.2.3.2.1).

Table 3.2.3.2.1. Estimated change in red snapper target trips relative to Alternative 1.

	Private Boats	Charterboats	Head Boats	Total
No change in the average weight per fish from 2009				
Preferred Alternative 2	57,530	11,253	3,052	71,865
Alternative 3	39,172	9,610	1,624	50,406
15% increase in the average weight per fish from 2009				
Preferred Alternative 2	55,452	11,869	2,458	69,779
Alternative 3	34,963	8,349	1,266	44,578

The economic effects of the proposed alternatives on recreational anglers sector were evaluated in terms of expected changes economic benefits as measured by changes in consumer surplus (CS). As discussed in Section 2.3.2.2 and Appendix A, CS is the amount of money that an angler would be willing to pay for a fishing trip over and above the cost of the trip. The estimated changes in CS of the proposed alternatives relative to **Alternative 1** are provided in Table 3.2.3.2.2. **Preferred Alternative 2** would be expected to result in an increase in CS of approximately \$3.74-\$3.85 million relative to **Alternative 1**, while **Alternative 3** would be expected to result in an increase in CS of approximately \$2.39-\$2.70 million. Because red snapper target activity is primarily recorded in the private boat sector (see Section 2.3.2.1), increases in CS to the private boat sector dominates.

Table 3.2.3.2.2. Estimated change in consumer surplus relative to Alternative 1 (2008 dollars).

	Private Boats	Charterboats	Head Boats	Total
No change in the average weight per fish from 2009				
Preferred Alternative 2	\$3,080,000	\$602,000	\$163,000	\$3,845,000
Alternative 3	\$2,097,000	\$514,000	\$87,000	\$2,698,000
15% increase in the average weight per fish from 2009				
Preferred Alternative 2	\$2,968,000	\$635,000	\$132,000	\$3,735,000
Alternative 3	\$1,872,000	\$447,000	\$68,000	\$2,386,000

The comparable measure of economic benefits for for-hire vessels (charterboats and head boats) is producer surplus (PS). Producer Surplus is the amount of money that the vessel owner earns over and above the cost of providing the trip. Because the PS is unknown for these vessels, net operating revenue (NOR) is used as the proxy for PS, where NOR is defined as operating 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 is the return used to pay all labor wages, returns to capital, and owner profits. The estimated changes in NOR of the proposed alternatives relative to **Alternative 1** are provided in Table 3.2.3.2.3. **Preferred Alternative 2** would be expected to result in an increase in NOR of approximately \$1.82-\$1.88 million relative to **Alternative 1**, while **Alternative 3** would be expected to result in an increase in NOR of approximately \$1.30-\$1.50 million.

Table 3.2.3.2.3. Estimated change in net operating revenue relative to Alternative 1 (2008 dollars).

	Head Boats	Charterboats	Total
No change in the average weight per fish from 2009			
Preferred Alternative 2	\$150,000	\$1,666,000	\$1,815,000
Alternative 3	\$80,000	\$1,422,000	\$1,502,000
15% increase in the average weight per fish from 2009			
Preferred Alternative 2	\$120,000	\$1,757,000	\$1,877,000
Alternative 3	\$62,000	\$1,236,000	\$1,298,000

It should be noted that the estimates provided above only represent the expected effects in the single year, 2010, under the assumption of no behavioral changes by anglers. Specifically, the analysis assumes that the different season lengths resulting from the alternative total allowable catch have no differential effects on either the frequency or timing of trips or the likelihood or incidence of high grading. As such, the analysis assumes that regardless of the length of the fishing season, trip behavior during the open season remains unchanged. Conceptually, both assumptions could be false. When faced with a shorter season, some anglers may choose to increase the number of trips taken during the open season, shifting effort from the now closed season to the shortened open season. The likelihood of this occurring may increase as the length of the proposed or expected season decreases. Alternatively, if the option to take more trips is not practical, an angler may be motivated to fish longer and high grade their harvest when they otherwise would not; their perspective could be, for example, one trip with two above average fish is a good compromise if two trips with two average fish per trip are no longer possible. Again, the likelihood of this occurring may increase as the length of the proposed or expected season decreases. To some extent, allowing the average weight per fish to increase by up to 15% may account for an increased rate of high grading that may already have occurred in recent years rather than the increase in size being due to natural stock improvements. However, the incidence of high grading might increase such that a 15% increase is insufficient to capture the full effect. While either behavior, changing the number or timing of trips or the incidence of high grading, may not have substantive adverse economic effects on the current fishing year – the behavior could not be tracked on sufficient real-time basis to affect the length of the current season – it would likely result in quota overages for the sector and necessitate increased restrictions in subsequent years. Thus, a multi-year sum of expected effects may not equal the first year effects times the number of years. In this discussion, although no overage pay-back requirement exists for the red snapper fishery, the biological goals are assumed to be preserved by periodic stock assessment and total allowable catch specification. Thus, it is assumed that annual quota overages, regardless of the cause, do not jeopardize long term recovery goals and benefits, but rather, just the incremental annual benefits received during the path to recovery.

While consideration of these effects are absent from the current analysis, the practical implication of their omission is minimal. Under the logic that the likelihood of their occurrence (increased effort shift and increased high grading) increases with the shortening of the season, the functional effect of their omission is that the benefits of an extended season are understated relative to a shorter season; the economic benefits of **Preferred Alternative 2** relative to **Alternative 3**, and **Alternative 3** relative to **Alternative 1** are greater than indicated by the numbers presented above. Thus, the ranking of alternatives is unaffected. Only the magnitude of differences in expected effects is affected.

3.2.3.3 Economic Activity Associated with Estimated Economic Effects

This section provides estimates of the economic activity associated with the potential changes in commercial ex-vessel revenues and recreational angler trips that may occur as a result of the proposed management changes. This economic activity is characterized in the form of FTE jobs, income impacts (wages, salaries, and self-employed income), output (sales) impacts (gross business sales), and value added impacts (difference between the value of goods and the cost of materials or supplies). Income and value-added impacts are not equivalent, though similarity in

the magnitude of multipliers may result in roughly equivalent values. These estimates are provided to inform the decision process of the potential consequences of the proposed management actions. However, it should be emphasized that these estimates should not be confused with potential changes in economic value as a result of the proposed management measures. Estimates of the potential changes in economic value were provided in Sections 3.2.3.1 and 3.2.3.2.

The calculation of the change in economic activity utilizes common variables used in the calculation of the expected change in economic value, specifically the expected change in ex-vessel revenues in the commercial sector and angler trips in the recreational sector. Because both assessments (change in economic value and change in economic activity) use these common variables, the ranking of alternatives based on the magnitude of these effects is unaffected by the metric examined; the greater the estimated change in economic value, the greater the estimated change in economic activity.

The estimates of the change in economic activity should be used or interpreted with caution. While some change (loss or gain) of economic activity would be expected with any change in commercial revenues or recreational trips (expenditures), the full change (loss or gain) of the estimates provided below should not be expected to occur as a result of the proposed management changes. The primary reason for this caution is the calculation of these results does not account for behavioral changes that would be expected to occur in response to the proposed management changes. The nature of these behavioral changes varies by sector. In the commercial sector, any estimated losses in ex-vessel revenues may be overstated if fishermen are able to direct their fishing effort to substitute species. In the event that gains in revenues for a particular species are forecast, these gains may come at the expense of reduced harvests (and revenues) of other species. As a result, the net gain may be over-stated. An example of this may have recently occurred in the red snapper fishery. As discussed in Section 2.3.1.2, the quota-induced reduction in red snapper revenues by approximately \$2.7 million (2008 dollars) in 2008 relative to 2007 compared to the reduction in total revenues from all harvests by affected vessels of approximately \$2.0 million may be an example of species substitution to mitigate potential revenue losses.

In addition to uncertainty associated with the estimation of changes in ex-vessel revenues, some categories of economic activity associated with these revenues should not be expected to be affected to the extent encompassed by the model estimates when fishing revenues change. As seen in the tables below, commercial fishing revenues are estimated to generate economic activity in multiple sectors of the economy. As summarized in Table 3.2.3.3.1, these include the harvester, dealer/processor, wholesaler/distributor, grocer, and restaurant sectors. While the loss of jobs and economic activity in the harvester and dealer/processor sectors may seem reasonable in response of declines in fish revenues due to potentially limited substitution opportunities, similar losses in other sectors are less reasonable. As seen in Table 3.2.3.3.1, the economic activity associated with the estimated change in ex-vessel revenues is dominated by activity in the restaurant sector. Given dining substitution alternatives, including both imported and domestic seafood, as well as non-seafood fare, there should be little rational expectation that reduction in the supply of a single species, even a popular species like red snapper, would result in the loss of either the full amount or a substantial portion of the estimated associated economic

activity. The same logic applies to activity in the grocers sector and, to lesser degrees, secondary wholesalers/distributors and primary dealers/processors; each sector would be expected to attempt to locate and promote the sales of similar product from alternative sources or other products. Even should diners choose to eat out less in response to a reduced supply of domestic seafood, a portion of the food component of their affected restaurant expenditures would be expected to be re-directed to grocery expenditures, while a portion of the recreational (entertainment) component of their affected restaurant expenditures would be expected to be re-directed towards other recreational activities. The remaining portion of their affected restaurant expenditures would be expected to be redirected to other budget expenses. As a result, while the resulting economic activity associated with these behavioral changes would no longer be associated with the domestic fishery for the regulated species, the economic activity in certain sectors would likely be maintained rather than lost. In the case of expected gains in revenues, as is the case in the proposed increase in red snapper total allowable catch, improved employment conditions (greater job stability and improved incomes for current workers) may occur, particularly initially, instead of increased employment in the harvester and dealer/processor sectors, and in the grocer and restaurant sectors, increased consumption or purchases of the subject species may occur at the expense of other species/products rather than represent new economic activity supporting new jobs.

For the recreational sector, the primary behavioral change not captured in the analysis is the potential shift of fishing trips and associated expenditures to alternative target species or alternative recreational activities. In the event of more restrictive management, continued fishing but for alternative target species may entail platform or location switching (fishing from a different mode or port), resulting in changed expenditure patterns; anglers may spend less money and/or make their purchases from different vendors or in different communities. As a result, expenditure patterns may change and businesses with reduced activity would suffer losses while businesses with increased activity would experience gains. All the economic activity, however, would not be removed from the fishing industry or associated businesses as a whole. Alternatively, substitution of new recreational activities in lieu of fishing, either in the same or different communities, while economically harmful to the fishing industry, would represent gains to these alternative sectors. As a result, the extent to which a community retains its character as a fishing destination may change all the economic activity associated with reduced fishing would not necessarily be lost to the region or community.

In the event of less restrictive management in the recreational sector, the realization of increased economic activity may depend on certain circumstances. In the case of the current proposed action, the estimates of the economic activity associated with the expected increase in total allowable catch represents normal activity (from previous years) that can be maintained (repeated) rather than lost relative to the more restrictive conditions (shorter season) that would exist under the no action situation (**Alternative 1**). As such, the associated economic activity is not new activity attracted into the fishery by increased trips; the gains represent the avoidance of a loss. While avoidance of loss is a benefit, these benefits are not the result of current fishermen taking more trips than they historically have taken, or the result of new trips by new fishermen entering the red snapper fishery.

Alternatively, rather than attracting more effort, an increase in total allowable catch might result in an increase in the bag limit, a decrease in the minimum size limit, or simply more current anglers harvesting the bag limit. As a result, while affected anglers would receive increased economic value from their fishing experience, the number of angler trips may not increase, and little to no change in the economic activity associated with the management of that species may occur.

In summary, the following results capture neither the behavioral possibilities within the fishing industry itself nor the substitution possibilities in associated sectors. Some loss of economic activity in some sectors and communities is likely unavoidable in response to reduced commercial ex-vessel revenues and recreational trips. However, loss of the total economic activity associated with these revenues or angler trips should not be expected. Similarly, some gain in economic activity would likely occur in the event of increased commercial revenues or recreational trips. However, gain of the total potential economic activity associated with these revenues or angler trips should not be expected.

Table 3.2.3.3.1 provides estimates of the potential change in economic activity associated with the estimated change in commercial ex-vessel revenues for **Preferred Alternative 2** and **Alternative 3** relative to **Alternative 1**. Based on an estimated increase in ex-vessel revenues of approximately \$3.261 million (2008 dollars) in 2010, **Preferred Alternative 2** would be expected to support a total of 615 FTE jobs, approximately \$18.299 million in income impacts, and approximately \$42.936 million in output (sales) impacts more than **Alternative 1**. Consistent with the lower total allowable catch in **Alternative 3** relative to **Preferred Alternative 2**, **Alternative 3** would be expected to also support increased economic activity relative to **Alternative 1**, but lower impacts than **Preferred Alternative 2**.

Table 3.2.3.3.1. Potential change in economic activity associated with the estimated change in the commercial sector ex-vessel revenues relative to Alternative 1. All dollar values are in 2008 dollars.

Industry Sector	Preferred Alternative 2	Alternative 3
Ex-vessel revenues	\$3,261,000	\$1,708,000
Harvesters		
Employment impacts (FTE jobs)	80	42
Income Impacts	\$2,689,000	\$1,408,000
Output Impacts	\$6,989,000	\$3,661,000
Primary dealers/processors		
Employment impacts (FTE jobs)	49	26
Income Impacts	\$2,261,000	\$1,184,000
Output Impacts	\$7,036,000	\$3,685,000
Secondary wholesalers/distributors		
Employment impacts (FTE jobs)	41	22
Income Impacts	\$2,213,000	\$1,159,000
Output Impacts	\$5,188,000	\$2,718,000
Grocers		
Employment impacts (FTE jobs)	25	13
Income Impacts	\$921,000	\$482,000
Output Impacts	\$2,003,000	\$1,049,000
Restaurants		
Employment impacts (FTE jobs)	420	220
Income Impacts	\$10,215,000	\$5,350,000
Output Impacts	\$21,719,000	\$11,376,000
Total		
Employment impacts (FTE jobs)	615	322
Income Impacts	\$18,299,000	\$9,584,000
Output Impacts	\$42,936,000	\$22,488,000

Table 3.2.3.3.2 provides estimates of the potential change in economic activity associated with the estimated change in recreational trips for **Preferred Alternative 2** and **Alternative 3** relative to **Alternative 1**. Based on an expected increase in angler effort of approximately 55,500-57,500 trips in 2010, **Preferred Alternative 2** would be expected to support up to 78 FTE jobs, approximately \$7.7 million in output (sales) impacts, and approximately \$4.3 million in value added impacts more than **Alternative 1**. Consistent with the lower total allowable catch in **Alternative 3** relative to **Preferred Alternative 2**, **Alternative 3** would be expected to support increased economic activity relative to **Alternative 1**, but lower impacts than **Preferred Alternative 2**.

Table 3.2.3.3.2. Potential change in economic activity associated with the estimated change in recreational trips relative to Alternative 1. All dollar values are in 2008 dollars.

	Alternative 2, 0%*	Alternative 2, 15%	Alternative 3, 0%	Alternative 3, 15%
Private/Rental Sector				
Trips	57,530	55,452	39,172	34,963
Output Impact	\$3,493,000	\$3,367,000	\$2,379,000	\$2,123,000
Value Added Impact	\$1,920,000	\$1,850,000	\$1,307,000	\$1,167,000
Jobs	34	32	23	20
Charterboat Sector				
Trips	11,253	11,869	9,610	8,349
Output Impact	\$4,091,000	\$4,315,000	\$3,494,000	\$3,035,000
Value Added Impact	\$2,364,000	\$2,493,000	\$2,018,000	\$1,754,000
Jobs	44	46	37	32
Head Boat Sector				
Trips	3,052	2,458	1,624	1,266
Output Impact	na**	na	na	na
Value Added Impact	na	na	na	na
Jobs	na	na	na	na
All Sectors				
Trips	71,835	69,779	50,406	44,578
Output Impact	\$7,584,000	\$7,682,000	\$5,873,000	\$5,158,000
Value Added Impact	\$4,284,000	\$4,343,000	\$3,325,000	\$2,921,000
Jobs	77	78	60	53

*percentage refers to the assumed increase in the average weight per red snapper harvested.

**na = not available.

3.2.4 Direct and Indirect Effects on the Social Environment

It is anticipated that the social impacts from this action would be beneficial to the both sectors of the fishery if the total allowable catch is increased (Table 3.2.4.1). However, the benefits of this action would accrue primarily to the commercial sector as the suggested increases in total allowable catch for the recreational sector would likely not increase their fishing season, in fact the season would likely be shorter than the previous year. Because the recreational fishery has had overages in the past few years, the Council could implement measures that would temper any increase in the recreational sector total allowable catch, although the season may be longer under **Preferred Alternative 2** or **Alternative 3**, there would be an overall decrease in the recreational fishing season compared to last year.

Table 3.2.4.1. Total Allowable Catch and Number of Recreational Fishing Days under Alternatives.

Sector	Alternative 1 Current TAC	Preferred Alternative 2 TAC	Alternative 3 TAC
Commercial	2.550	3.542	3.070
Recreational	2.450	3.403	2.949
Recreational Fishing Season	34-40 days	51-60 days	43-51 days

The No Action, **Alternative 1**, would maintain the total allowable catch at its current level and could improve the stock status sooner with a lower harvest level than **Preferred Alternative 2** or **Alternative 3**. With no action, there would be little change in fishing behavior from the commercial sector, while the recreational sector would see a shorter fishing season as a result of the overages that have been occurring over the past two years. That is considerably shorter than the fishing season last year, but is based upon measures that were recently implemented to constrain the recreational harvest as discussed above. There has been considerable dismay over the shortened fishing season and under **Alternative 1** the recreational fishing season would likely be 34-40 days. How recreational fishing behavior would change given the shortened season is not entirely known, although it has been suggested that there could be a race for the fish with charter fishermen making more trips for red snapper per day if possible. Although private recreational fishermen could do the same, it is unlikely that many would choose to make multiple trips and would more likely target other species to conserve fuel and time (see discussion above in section 3.2.3). One behavior that has already been factored into the change of season is the size of red snapper being harvested. In recent years the size of harvested red snapper has increased which has led to a shorter fishing season as the sector total allowable catch has been met sooner than anticipated with a higher average weight. With a shorter fishing season, fishermen may be high grading to harvest larger fish within the 2 fish bag limit but without evidence through empirical research it not known whether this is occurring or to what extent.

Preferred Alternative 2 would provide for the largest increase in total allowable catch among all alternatives. With the 25% buffer for scientific uncertainty, this total allowable catch would allow for an increase in sector total allowable catch yet continue harvesting at levels below the approximated Foy. The commercial fishery would see an increase of almost 1 million pounds which would likely increase the trading of portions of their allocation as fishermen adjust their seasonal fishing round to accommodate the larger commercial total allowable catch for red snapper. During the 2008 fishing season there was a decrease in the pounds of allocation traded due to a reduction in total allowable catch, therefore an increase in trading of allocation might be expected with an increase (NMFS 2009). This increase in total allowable catch could also initiate more trading of shares. There is some anecdotal evidence that red snapper individual fishing quota participants may have shifted effort in anticipation of an individual fishing quota program for other snapper species in order to build up a catch history. How this increase in total allowable catch would affect fishing behavior is unclear as those who continue to try to build up catch history for other species may either shift some fishing effort, hold their allocation of red snapper, or trade a portion of it. It is likely that there could be an increase in the trading of allocation if effort shifts do not occur.

Just prior to the implementation of the red snapper individual fishing quota system for the commercial fishery, there was a reduction in total allowable catch which changed the initial allocation and shares for recipients. This increase in total allowable catch should provide shareholders an increase toward what their initial allocation might have been had there not been a decrease in total allowable catch. The benefits of this action could accrue most likely to the communities of Destin, Fort Walton Beach, Panama City, and Pensacola Florida; Grand Bay, Alabama; Pascagoula, Mississippi; Golden Meadow, Louisiana and Galveston and Freeport, Texas.

As noted previously, the increase in total allowable catch for the recreational sector in **Preferred Alternative 2** would allow for a range of 51-60 days for the recreational fishing season. While the number of days is more than **Alternative 1**, the season would be shorter than the previous year due to measures that are being implemented. It is anticipated that this would mean some species substitution as fishermen switch their fishing effort to other species during the closure. Although there would be more days, the shortened season would be controversial as many in the recreational sector have suggested that the current system of estimating the recreational harvest is flawed. A new system for estimating the recreational harvest is to be introduced, but has yet to be fully implemented. In the meantime, the current system of measuring the recreational harvest is the best estimate and would result in a shortened season to accommodate the overages. It is likely that some in the recreational sector would want to see a change in the percentage allocation between sectors as a result of the shortened season. On the other hand, opponents to changing the allocation percentage would argue that until a system for constraining the recreational overages can be implemented, there should be no change. That debate would likely continue as red snapper recovers and further proposals for individual fishing quotas are considered for other reef fish and other fishery management plans. In that regard, the trading of allocation and shares between sectors would also be promoted if the recreational sector continues to have overages prior to the 5 year review of the red snapper individual fishing quota program. Recreational fishing communities that may be affected are Destin and Panama City, Florida; Orange Beach and Dauphin Island, Alabama; Pascagoula, Mississippi; Venice and Grand Isle, Louisiana and Galveston and Freeport, Texas.

Alternative 3 would increase total allowable catch for both sectors, but would be a smaller increase as shown in Table 3.2.4.1. The increase of slightly over a half a million pounds for the commercial sector would likely have similar impacts to those in **Preferred Alternative 2**. While some would increase their landings of red snapper, other commercial individual fishing quota fishermen may hold onto their allocation or sell a portion on the market. Again, for those who have shifted to alternate species to build catch history, that behavior may continue. As for the recreational sector this increase would allow a recreational season of 43-51 days and would be considerably shorter than last year's season. The impacts would be similar to those discussed under **Preferred Alternative 2** although the even shorter season may have greater impacts.

One consideration of an increase in recreational total allowable catch is that the states differ in their implementation of concurrent regulations with regard to a recreational fishing season. Florida and Texas have not always maintained the same seasonal closure as in Federal waters. Therefore impacts may vary according to each state's regulatory regime with regard to a red snapper closure.

3.2.5 Direct and Indirect Effects on Administrative Environment

None of the alternatives should result in any direct or indirect effects to the administrative environment, because the type of regulations needed to manage the fishery would remain unchanged regardless of what total allowable catch is set at. The National Marine Fisheries Service law enforcement, in cooperation with state agencies, would continue to monitor regulatory compliance with existing regulations and National Marine Fisheries Service would continue to monitor both recreational and commercial landings to determine if landings are meeting or exceeding specified quota levels. The enforcement and administrative environments were recently enhanced with an individual fishing quota program for the commercial red snapper fishery, requiring National Marine Fisheries Service to monitor the sale of red snapper individual fishing quota shares, and a vessel monitoring systems in the reef fish fishery. Recordkeeping requirements for individual fishing quota shares have improved commercial quota monitoring and prevent or limit overages from occurring. The individual fishing quota and VMS requirements have reduced the burden of monitoring compliance with commercial fishing regulations.

3.2.6 Cumulative Effects

The cumulative effects from the red snapper rebuilding plan have been analyzed in Amendment 22 and 27/14, and cumulative effects to the reef fish fishery have been analyzed in Amendments 30A, 30B, and 31, and are incorporated here by reference. The effects of setting total allowable catch in this regulatory amendment are most closely aligned with the effects from with the revisions to the red snapper rebuilding plan in Amendment 27/14. This analysis found the effects on the biophysical and socioeconomic environments are positive since they would ultimately restore/maintain the stock at a level that allows the maximum benefits in yield and commercial and recreational fishing opportunities to be achieved. However, short-term negative impacts on the fisheries' socioeconomic environment have occurred and are likely to continue due to the need to limit directed harvest and reduce bycatch mortality. These negative impacts can be minimized by selecting measures that would provide the least disruption to the fishery while maintaining total allowable catch consistent with the rebuilding plan. For the recreational fishery, this would mean using combinations of bag limits, size limits and closed seasons to minimize disruptions, and for the commercial fishery by using a combination of size limits with the individual fishing quota program.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Environmental Protection Agency's climate change webpage provides basic background information on these and other measured or anticipated effects. Global climate changes could have significant effects on Gulf fisheries; however, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002). Modeling of

climate change in relation to the northern Gulf hypoxic zone may exacerbate attempts to reduce the area affected by these events (Justic et al. 2003). It is unclear how climate change would affect reef fishes, and likely would affect species differently. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact Gulf reef fish species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts would occur. Actions from this amendment are not expected to significantly contribute to climate change through the increase or decrease the carbon footprint from fishing.

The effects of the proposed action are, and will continue to be, monitored through collection of landings data by National Marine Fisheries Service, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. Landings data for the recreational sector in the Gulf of Mexico is collected through Marine Recreational Fisheries Statistics Survey, National Marine Fisheries Service' Head Boat Survey, and the Texas Marine Recreational Fishing Survey. Marine Recreational Fisheries Statistics Survey is currently being replaced by Marine Recreational Information Program, a program designed to improve the monitoring of recreational fishing. Commercial data is collected through trip ticket programs, port samplers, and logbook programs. Currently, an update SEDAR assessment of Gulf of Mexico red snapper is scheduled for 2013.

4 REGULATORY IMPACT REVIEW

4.1 Introduction

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

4.2 Problems and Objectives

The problems and objectives addressed by this proposed regulatory amendment are discussed in Section 1.2 of this document and are incorporated herein by reference. In summary, based on the recently completed red snapper update assessment indicating that overfishing is projected to end, the Scientific and Statistical Committee has recommended an annual catch limit greater than the current total allowable catch. Management measures considered in this regulatory amendment are intended to increase the red snapper total allowable catch and make the resulting recreational and commercial quotas consistent with goals and objectives of the Council's red snapper rebuilding plan.

4.3 Description of Fisheries

A description of the Gulf red snapper fishery is provided in Sections 2.3 and 2.4 of this document and is incorporated herein by reference.

4.4 Impacts of Management Measures

4.4.1 Action 1: Set Red Snapper Total Allowable Catch

A detailed analysis of the expected impacts of this action is contained in Section 3.2.3 and is incorporated herein by reference. In addition to a no action alternative (**Alternative 1**), **Action 1** considers increases in red snapper total allowable catch. **Preferred Alternative 2**, which is based on the recommendation made by the Council's Scientific and Statistical Committee, would increase the total allowable catch to 6.945 MP. **Alternative 3** would increase the red snapper total allowable catch to 6.019 mp. For the recreational and commercial sectors, the greater the increase in total allowable catch the greater the economic benefits are expected to be. Hence, the largest economic benefits are anticipated to be associated with **Preferred Alternative 2**. For the

recreational sector, **Preferred Alternative 2** is expected to result in an increase in consumer surplus of approximately \$3.74-\$3.85 million relative to **Alternative 1**, while **Alternative 3** would be expected to result in an increase in consumer surplus of approximately \$2.39-\$2.70 million. In the for-hire sector, increases in net operating revenues expected under **Preferred Alternative 2** are estimated at approximately \$1.82-\$1.88 million relative to **Alternative 1**, while **Alternative 3** would be expected to result in an increase in net operating revenues of approximately \$1.30-\$1.50 million. Relative to **Alternative 1**, changes in gross revenues expected from the implementation of **Preferred Alternative 2** are estimated at approximately \$3.26 million for the commercial sector; changes in gross revenues anticipated under **Alternative 3** are estimated at approximately \$1.70 million.

4.5 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 that can be expressed as costs associated with the regulations. Costs associated with this specific action would include:

Council costs of document preparation, meetings, public hearings, and information dissemination.....	\$25,000
NMFS administrative costs of document preparation, meetings, and review	\$20,000
TOTAL.....	\$45,000

The Council and Federal costs of document preparation are based on staff time, travel, printing, and any other relevant items where funds were expended directly for this specific action. There are no permit requirements proposed in this regulatory amendment. To the extent that there are no quota closures proposed in this regulatory amendment or other regulatory measures, no additional enforcement activity is anticipated. In addition, under a fixed budget, any additional enforcement activity due to the adoption of this regulatory amendment would mean a redirection of resources to enforce the new measures.

4.6 Determination of Significant Regulatory Action

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

Based on the information provided above, this action has been determined to not be economically significant for purposes of E.O. 12866.

5 REGULATORY FLEXIBILITY ACT ANALYSIS

5.1 Introduction

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

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

5.2 Statement of the need for, objectives of, and legal basis for the rule

A discussion of the reasons why action by the agency is being considered is provided in Section 1.2 of this document and is incorporated herein by reference. In summary, the purpose of this proposed rule is to set the red snapper total allowable catch and the resulting recreational and commercial quotas consistent with the goals and objectives of the Council’s red snapper rebuilding plan and achieving the mandates of the Magnuson-Stevens Act. The objective of this amendment is to support the rebuilding of the red snapper resource in the Gulf of Mexico and allow harvest at optimum yield. The Magnuson-Stevens Act provides the statutory basis for this proposed rule.

5.3 Description and estimate of the number of small entities to which the proposed action would apply

This proposed rule, if implemented, would be expected to directly affect commercial and for-hire fishing vessels that harvest red snapper in the Gulf of Mexico. Based on logbook records, for the period 2007-2008, an average of 312 vessels per year recorded commercial red snapper landings in the Gulf of Mexico. The total average annual ex-vessel revenues from all logbook-recorded harvests from all species for these vessels during this period was approximately \$28.943 million (2008 dollars), of which approximately \$9.435 million came from red snapper. For all vessels with logbook-recorded landings of red snapper, the average annual total revenue per vessel during this period was approximately \$93,000 (2008 dollars).

Some fleet activity occurs in the Gulf of Mexico commercial reef fish fishery. Based on permit data, the maximum number of permits reported to be owned by the same entity is 6, though additional permits may be linked through other affiliations which cannot be identified through current data. Using the average revenue per vessel provided above, the average annual combined revenues for this entity would be approximately \$558,000 (2008 dollars).

The for-hire fleet is comprised of charterboats, which charge a fee on a vessel basis, and headboats, which charge a fee on an individual angler (head) basis. A Gulf reef fish for-hire permit is required to harvest red snapper in the Gulf of Mexico. On December 23, 2009, there were 1,266 active Gulf reef fish for-hire permits. An active permit is a non-expired permit. Expired reef fish for-hire permits may not be actively fished, but are renewable for up to one year after expiration. Because of the extended renewal period, numerous permits may be expired but renewable at any given time of the year, resulting in the total number of permits (and associated vessels) potentially active over the course of the entire calendar year being a few hundred more than the number of active permits on a given date. Although the permit does not distinguish between headboats and charter boats, an estimated 79 headboats operate in the Gulf. It cannot be determined with available data how many of the for-hire vessels permitted to operate in the reef fish fishery harvest red snapper, so all permitted vessels are assumed to comprise the universe of potentially affected vessels. The average charterboat is estimated to earn approximately \$88,000 (2008 dollars) in annual revenues, while the average headboat is estimated to earn approximately \$461,000 (2008 dollars).

The Small Business Administration has established size criteria for all major industry sectors in the U.S. including fish harvesters. A business involved in fish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of \$4.0 million (NAICS code 114111, finfish fishing) for all its affiliated operations worldwide. For for-hire vessels, the other qualifiers apply and the revenues threshold is \$7.0 million (NAICS code 713990, recreational industries). Based on the average revenue estimates provided above, all commercial and for-hire vessels expected to be directly affected by this proposed rule are determined for the purpose of this analysis to be small business entities.

5.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records.

This proposed rule would not establish any new reporting, record-keeping, or other compliance requirements.

5.5 Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed rule

No duplicative, overlapping, or conflicting federal rules have been identified.

5.6 Significance of economic impacts on small entities

Substantial number criterion

This proposed rule, if implemented, would be expected to directly affect all commercial vessels that harvest red snapper in the Gulf of Mexico. Based on logbook records, for the period 2007-2008, an average of 312 vessels per year recorded commercial red snapper landings. These vessels are a subset of the vessels permitted to harvest commercial quantities of reef fish in the Gulf of Mexico. On January 7, 2010, 904 vessels had active commercial reef fish permits, while an unknown number of additional expired permits may have been renewable within the one-year renewal period. Based on the number of active permits, the average number of vessels with recorded commercial red snapper landings is estimated to comprise over 30% of the total number of vessels permitted to harvest commercial quantities of reef fish in the Gulf of Mexico.

This proposed rule, if implemented, would also be expected to directly affect all for-hire vessels that harvest red snapper. On December 23, 2009, there were 1,266 active Gulf reef fish for-hire permits. It cannot be determined with available data how many of the for-hire vessels permitted to operate in the reef fish fishery harvest red snapper, so all permitted vessels are assumed to comprise the universe of potentially affected vessels.

Significant economic impacts

The outcome of “significant economic impact” can be ascertained by examining two factors: disproportionality and profitability.

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

All entities expected to be directly affected by the measures in this proposed rule are determined for the purpose of this analysis to be small business entities, so the issue of disproportionality does not arise in the present case.

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

As a result of the increase in commercial red snapper harvests and the lengthening of the recreational red snapper fishing season, this proposed action is expected to increase commercial ex-vessel revenues by up to \$3 million and increase net operating revenues to for-hire businesses by up to \$3.8 million annually relative to the status quo. As a result, no reduction in profits for a substantial number of small entities is expected.

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

This proposed action, if implemented, is not expected to have a significant direct adverse economic effect on the profits of a substantial number of small entities. As a result, the issue of significant alternatives is not relevant.

6 FINDING OF NO SIGNIFICANT IMPACT

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. On July 22, 2005, NOAA published a Policy Directive with guidelines for the preparation of a Finding of No Significant Impact (FONSI). In addition, the 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, the proposed action would not jeopardize the sustainability of the target species. The most recent stock assessment update projects existing regulations and harvesting restrictions have ended overfishing of this stock, and the stock size is improving. The proposed action is intended to ensure the catch for 2010 will remain below the overfishing threshold, so that overfishing does not recur. The Council’s Scientific and Statistical Committee recommended an allowable biological catch at 75% of the catch level that would lead to overfishing. This difference between the overfishing threshold and the allowable biological catch allows for scientific uncertainty in the assessment. The Scientific and Statistical Committee’s recommendation for allowable biological catch is precautionary, recommending harvests (6.945 MP) roughly equivalent to that which would be achieved if the fishery were fishing at optimum yield (7.08 MP).

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

Response: No, the proposed action will not jeopardize the sustainability of any non-target species, and is not expected to substantially alter standard fishing practices during the 2010 fishing season. The action is intended to allow an increase in the harvest of red snapper in the U.S. waters of the Gulf of Mexico from 5.0 MP to 6.945 MP, based on recent scientific advice indicating an improved status of the stock. Increasing the total allowable catch should provide for a reduction in regulatory discards of red snapper, and to some extent, if the period when fishing for red snapper is allowed, there would some relief of fishing pressure on other species that are targeted during periods when fishing for red snapper is prohibited.

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 Act and identified in FMPs?

Response: No, the proposed action is not reasonably expected to cause substantial damage to the ocean and coastal habitats and/or Essential Fish Habitat in the U.S. waters of the Gulf of Mexico. The increase in allowable harvest may increase fishing effort to some degree; however, because the allowable harvest may be taken in a shorter time period from such increases, the overall

fishing impacts to Essential Fish Habitat may be lessened. Nevertheless, vertical line gear has the potential to snag and entangle bottom structures. Although individual gear has a very small footprint the cumulative impact of the commercial and recreational fishing sector results in a large amount of gear being placed in the water, increasing the potential for impact. Additionally, anchoring can add to the potential damage of the bottom at fishing locations.

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. The commercial red snapper fishery in the Gulf of Mexico operates under an individual fishing quota, which removes the need to “race for the fish”, thus allowing fishermen to better choose when and how they want to fish. This increases safety at sea by eliminating the need for a derby fishery. The increase from 5.0 MP to 6.945 MP in allowable harvest is not expected to substantially alter the manner in which the recreational fishery in the Gulf of Mexico is prosecuted.

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 action is not expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species as the proposed action is not expected to substantially alter the manner in which the fishery is conducted in the Gulf of Mexico. A 2009 biological opinion for the Gulf of Mexico reef fish fishery determined the fishery is not likely to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of National Marine Fisheries Service or result in the destruction or adverse modification of critical habitat. In addition, the Gulf of Mexico reef fish fishery is classified in the 2010 Marine Mammal Protection Act List of Fisheries as Category III fishery (74 FR 58859, November 16, 2009). 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. Dolphins are the only species documented as interacting with this fishery. Bottlenose dolphins may feed on the bait, catch, and/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, the proposed action is not expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area. The proposed action to increase the allowable harvest of red snapper is not expected to substantially alter the manner in which the fishery is conducted in the Gulf of Mexico.

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. Allowing increased harvest of red snapper by both the commercial and recreational fishing sectors will have direct and indirect social and economic impacts to their respective sectors and to the shoreside operations that support them. However, these impacts are not related to, nor have an impact on, the natural or physical environment.

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 proposed action may be considered controversial in that the fishing industry often questions the validity of the science involved in the estimates of annual harvest and the status of the various targeted fish stocks. Nevertheless, the relaxation of harvesting restrictions is expected to be perceived in a positive manner.

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, Essential Fish Habitat, 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 of Mexico.

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 action proposes to adjust the total allowable catch of red snapper, in accordance with approved procedures outlined in the Council's Reef Fish FMP. Adjustments to total allowable catch are made regularly in many fisheries, based on updated information regarding the status of a specific stock or stocks.

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 to increase the allowable harvest of red snapper is not expected to substantially alter the manner in which the fishery is conducted.

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 there are none located in the affected area.

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 is not reasonably expected to result in the introduction or spread of a non-indigenous species. The proposed action to increase the allowable harvest of the regional red snapper stock is not expected to substantially alter the manner in which the fishery is conducted.

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 consideration. Fishing efforts for red snapper are regulated through quotas, trip limits, and other fishing restrictions. The Council revised its rebuilding plan for this overfished stock in 2008, and updated scientific information regarding the status of the stock indicates the stock is recovering within the bounds expected by the rebuilding plan.

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 pursuant to federal legal mandates for the management of fishery resources. It is not reasonably expected to threaten a violation of 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 could have a substantial effect on the target species or non-target species. In general, the proposed action to increase the allowable harvest of red snapper is not expected to substantially alter the manner in which the fishery is conducted. The proposed harvest levels are adjusted well below the overfishing threshold to ensure overfishing does not occur. There may be some lowering of fishing pressure on a variety of other reef fish and non-targeted stocks, because of the increased ability to harvest red snapper.

DETERMINATION:

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for this framework action to the FMP for the Reef Fish Fishery Resources of the Gulf of Mexico, it is hereby determined that this framework action will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement (EIS) for this action is not necessary.

Roy E. Crabtree, Ph.D.
Regional Administrator
Southeast Regional Office
National Marine Fisheries Service

Date

7 OTHER APPLICABLE LAW

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

Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a “notice and comment” procedure to enable public participation in the rulemaking process. Under the APA, National Marine Fisheries Service 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, National Marine Fisheries Service 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, National Marine Fisheries Service will determine if this plan amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. Their determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

Data Quality Act

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

Specifically, the Act directs the Office of Management and Budget (OMB) to issue government wide guidelines that “provide policy and procedural guidance to federal agencies for ensuring

and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies.” Such guidelines have been issued, directing all federal agencies to create and disseminate agency-specific standards to: (1) ensure information quality and develop a pre-dissemination review process; (2) establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and (3) report periodically to OMB on the number and nature of complaints received.

Scientific information and data are key components of FMPs and amendments and the use of best available information is the second national standard under the 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.

Endangered Species Act

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

Marine Mammal Protection Act

The Marine Mammal Protection Act 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 Marine Mammal Protection Act, the Secretary of Commerce (authority delegated to National Marine Fisheries Service) 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 National Marine Fisheries Service has under the Marine Mammal Protection Act 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 Marine Mammal Protection Act, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fishing efforts, and studies of pinniped-fishery interactions.

Under section 118 of the Marine Mammal Protection Act, National Marine Fisheries Service 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 Marine Mammal Protection Act, such as registration, observer coverage, and take reduction plan requirements. The reef fish fishery is classified as a Category III fishery indicating it has minimal impacts on marine mammals (see Section 2.2.2 of this regulatory amendment).

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 National Marine Fisheries Service to obtain approval from the OMB before requesting most types of fishery information from the public.

Executive Orders

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. The NOAA Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

E.O. 12866: Regulatory Planning and Review

Executive Order 12866: Regulatory Planning and Review, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, National Marine Fisheries Service 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 would 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. National Marine Fisheries Service has preliminarily determined that this action will not meet the economic significance threshold of any criteria.

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

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).

Information on the counties and 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 are presented. The threshold for comparison that is used is 1.2 times the state average such that, if the value for the county or community is greater than or equal to 1.2 times the state average, then the county or community is considered an area of potential EJ concern. Census estimated data for the year 2006-2008 was used and is listed below for each state and the counties where communities were identified as being reliant upon red snapper. Estimates are for county populations only because census estimate data are not provided for geographies below a population level of 20,000. Most fishing communities along the Gulf coast fall under that threshold, therefore the EJ thresholds calculated here are at the county level.

The 2006-2008 estimate of the minority (interpreted as non-white, the inverse of non-Hispanic white alone) population for Florida is 39.3%, while 12.6% of the total population was estimated to be below the poverty line. These values translate in EJ thresholds of approximately 47.1% or anything below 52.9% white alone and 15.1% or more of the population in poverty. None of the counties or communities included in the discussion exceeds the environmental justice thresholds for minorities; however, Escambia County is slightly over the threshold for poverty with 15.2% of its population in poverty.

The estimate for Alabama's minority population was 31.3%, while 16.3% of the total population was estimated to be below the poverty line. These values translate in EJ thresholds of approximately 37.6% or anything below 62.4% white alone and 19.6% or more of the population in poverty. Table 2.4.4 indicates that Mobile County exceeds the environmental justice thresholds for minorities with 60.6% of its population non-Hispanic and white alone. Neither county is over the threshold for poverty, although Mobile County is close with 19.4% of its population below the poverty line.

The 2006-2008 estimate of the minority population for Mississippi is 41.1%, while 21.0% of the total population is estimated to be below the poverty line. These values translate in EJ thresholds of approximately 49.3% or anything below 50.7% white alone and 25.2% or more of the population in poverty. None of the counties in the state exceed the thresholds for EJ considerations.

The 2006-2008 estimate of the minority population for Louisiana is 37.7%, while 18.5% of the total population was estimated to be below the poverty line. These values translate in EJ thresholds of approximately 45.2% or anything below 54.8% white alone and 22.2% or greater poverty level. None of the parishes considered here exceed the thresholds for EJ considerations.

The 2006-2008 estimate of the minority population for Texas is 31.3%, while 16.3% of the total population was estimated to be below the poverty line. These values translate in EJ thresholds of approximately 37.6% or anything below 62.4% white alone and 19.6% or greater poverty level. All of the Texas counties exceed the threshold for minority populations and Matagorda exceeds the poverty threshold. Exceeding the threshold for minorities is, in part, a result of the high number of Hispanics that live in the state and in coastal counties.

Based on the demographic information provided in section 2.4 there are counties that are near or exceed EJ thresholds. However, due to the nature of the actions within this amendment, it is unlikely that these populations would be adversely affected. With the preferred action an increase in the total allowable catch, then most of the impacts should be beneficial for all involved. Both **Preferred Alternatives 2 and 3** would increase the total allowable catch, with **Preferred Alternative 2** providing the largest increase. While this does not extend the recreational season, it does bring that sector closer to the goal of fishing within its sector total allowable catch. With no change in **Alternative 1**, it is unlikely that there would be adverse consequences, only a delay in the benefits of an increasing red snapper population.

In order to examine EJ issues below the community level it would be necessary to conduct a census of fishermen. The agency has not conducted such a survey and there has been little detailed research conducted among these fishermen to examine detailed information at the household level. Past research has indicated that most individuals that participate in the reef fish fishery are middle aged males, according to Waters (1994). Although there has not been any recent research into the ethnic character of red snapper fishermen, by far the majority of captains and crew are white non-Hispanic. Research conducted among North Carolina fishermen provides a demographic description that is typical of most fisheries within the southeast, with the possible exception of the Gulf shrimp fishery or some fisheries in the Florida Keys and Texas. Cheveront identifies the majority of participants as white, middle-aged males (Cheveront 2003). It is not

known how many fishermen in Texas would be classified as minorities, but it is likely that there would be more than in other states as the demographic descriptions for Texas Counties shows many more Hispanics. At this time, there is no detailed demographic information on the make-up of the crew for the commercial red snapper fishery.

Household income levels among participants in this fishery vary considerably with less than half of that income coming from commercial fishing for the average household according to Waters (1994), the most recent research to include estimates of household income. In that research there were 14% of participants reporting household income levels of less than \$10,000, however income levels and household size were not analyzed to determine where those levels would fall within poverty guidelines.

With regard to subsistence fishing, because this fishery is prosecuted primarily in the offshore area, most subsistence fishing would occur on board fishing vessels. Some commercial and charter operators may keep fish for their own consumption and private recreational fishermen may do the same whether they are on a charter, head boat or fishing from a privately owned vessel. There has been little to no research conducted on the subsistence fishing pattern of any of these groups, however, if the preferred action is to increase total allowable catch then it would seem to provide beneficial impacts to all subsistence fishermen, including those with EJ considerations.

Overall, the action contained in this amendment should have beneficial consequences for any EJ populations. Unfortunately, it is difficult to estimate the impacts at the community or household level without better and timelier data. It is assumed that the benefits of these actions would be distributed evenly among any EJ populations, yet without more detailed research on these populations and their fishing behavior and consumption it is difficult to outline either the precise benefits or disadvantages of these actions.

E.O. 12962: Recreational Fisheries

This Executive Order requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, it establishes a seven-member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires National Marine Fisheries Service and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

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, National Marine Fisheries Service approved and implemented Generic Amendment 3 for Essential Fish Habitat, which established additional HAPCs and gear restrictions to protect corals throughout the Gulf (see Section 2.1 of this regulatory amendment). There are no implications to coral reefs by the actions proposed in this amendment.

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 National Marine Fisheries Service, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate state, tribes and local entities (international too).

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

E.O. 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 (see Section 2.1 of this regulator amendment). The action in the regulatory amendment would not affect any areas reserved by federal, state, territorial, tribal or local jurisdictions.

Essential Fish Habitat

The amended Magnuson-Stevens Act included a new habitat conservation provision known as Essential Fish Habitat that requires each existing and any new FMPs to describe and identify Essential Fish Habitat for each federally managed species, minimize to the extent practicable impacts from fishing activities on Essential Fish Habitat that are more than minimal and not temporary in nature, and identify other actions to encourage the conservation and enhancement of that Essential Fish Habitat. To address these requirements the Council has, under separate action, approved an EIS (GMFMC 2004b) to address the new Essential Fish Habitat 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 Essential Fish Habitat. An Essential Fish Habitat consultation will be conducted for this action.

8 LIST OF PREPARERS

Name	Expertise	Responsibility	Agency
Dr. Steve Branstetter	Biologist	Introduction , Purpose and Need, and FONSI	SERO
Dr. David Carter	Economist	Economic analyses	SEFSC
Dr. Assane Diagne	Economist	Economic analyses and write ups/RIR/Summary	GMFMC
Dr. Stephen Holiman	Economist	Economic analyses/Review	SERO
Mr. Peter Hood	Biologist	Rationale and environmental consequences/Affected environment/Other applicable law	SERO
Dr. Mike Jepson	Anthropologist	Social analyses	SERO
Mr. David Keys	NEPA Specialist	Regional NEPA Coordinator	SERO
Ms. Jennifer Lee	Biologist	Protected resources review	SERO
Dr. Carrie Simmons	Biologist	Summary/Introduction/Purpose and need/TAC actions	GMFMC
Mr. Andy Strelcheck	Biologist	Biological analyses	SERO
Dr. Jim Waters	Economist	Economic analyses	SEFSC

9 LIST OF AGENCIES CONSULTED

Gulf of Mexico Fishery Management Council

NOAA Southeast Fishery Science Center

NOAA SERO Protected Resources Division

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Appendix A - Response to the 12/18/09 Analysis Request for a Regulatory Amendment to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico, 1/21/2010

Introduction

A regulatory amendment to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico proposes to revise the total allowable catch for the red snapper fishery. Possible total allowable catches of 5.0, 6.945, and 6.019 million pounds (MP) have been proposed for 2010, which would translate into recreational quotas of 2.45, 3.40, and 2.95 MPs, respectively. In addition, the recreational season will be revised to match the potential recreational harvest with its quota. The estimated recreational landings of red snapper for 2009 totaled 4.15 MP, representing a 1.7 MP quota overage. Based on the potential new quotas proposed for 2010 the SERO estimated the recreational red snapper season length to range from 34-60 days depending on the assumptions about increases in the average size of red snapper. The proposed policies are shown in Table 1. This note considers the economic effects of two proposed seasons relative to the “status quo” season for the case where there is no increase in the average size of red snapper and the case where there is a 15% increase. The status quo season length is defined as the season length expected to be necessary to keep the recreational harvest within the quota in 2010. Note that the “status quo” season is shorter than the actual season (Jun 1 - Aug 14) in 2009.

Approach

The change in economic value for a change in the recreational season for red snapper is measured in terms of consumer surplus to anglers and producer surplus to charter and head boat operations.³ Consumer surplus is the amount of money that an angler would be willing-to-pay for a fishing trip over and above the cost of the trip. In this analysis, we assume that all red snapper anglers are identical and that consumer surplus per day of red snapper fishing is constant⁴, and measure the change in value for a change in the season length as:

$$(1) \quad dCS = (X^1 - X^0) * v^*$$

where X^0 and X^1 measure the total number of target trips with the status quo and proposed season, respectively, and v^* is the additional value per day when the option to take a trip targeting red snapper is available.

Producer surplus for a charter or head boat fishing trip is the amount of money that the operator earns on the trip over and above the cost of providing the trip. In the case of an increase in the red snapper season length, some trips that formerly targeted other species will now target red

³ A simple framework for evaluating the economic effects of sportfishing trip regulations was presented by McConnell and Strand (1981).

⁴ The assumption of a constant consumer surplus per trip is common in popular travel cost models such as those based on count data or discrete choice specifications, especially when the assumption of repeated-choice is employed (Hellerstein and Mendelsohn 1993; Morey 1994). We also make the assumption of a constant marginal utility of income such that there is no difference between compensated or uncompensated measures of consumer surplus (Johanssen 1987 pp. 62-66). This assumption implies that demands, including the demand for red snapper fishing, are independent of income with, for example, a utility function that is separable in a numeraire good, $U = U(q_1, \dots, q_{n-1}, x) + q_n$.

snapper and some new trips will be taken to target red snapper. Assuming that the producer surplus per trip is constant regardless of the species targeted, for-hire operators would only gain from the *new* trips created as the result of the longer season length. However, the longer season may simply allow anglers who would have been fishing anyway to additionally harvest red snapper rather than result in new trips. In the absence of reliable information on how many new trips will be created when the red snapper season is extended, this analysis assumes that all of the additional red snapper trips ($X^1 - X^0$) are new trips. Because all of these trips would probably not be new, this assumption, in combination with a constant producer surplus per trip, is expected to overestimate the increase in producer surplus (PS) associated with a longer season.

$$(2) \quad dPS = (X^1 - X^0) * r.$$

where r equals the constant producer surplus per trip.

Application to the Proposed 2010 Sportfishing Seasons for Red Snapper

The information necessary to apply the above framework to the proposed 2010 sportfishing seasons for red snapper is as follows:

- 1) Constant consumer surplus per day when the option to target red snapper is available relative to when it is not
- 2) Constant charter and head boat producer surplus (net revenue) per red snapper trip
- 3) Total target trips for red snapper occurring in the period between the close of the status quo season and the close of the proposed seasons

Several potential measures of consumer surplus per trip for red snapper were reported in Appendix A of the “Analysis of the Expected Economic Effects of the August 5 Closure of the 2008 Red Snapper Recreational Fishery in Federal Waters of the Gulf Of Mexico” (ECA). For this application we suggest the value of \$44.91 which is the additional consumer surplus in (2003 dollars) when the angler is able to target red snapper with a 2 fish bag limit. Using a CPI adjustment factor of 1.192 (CUUR0000SA0, Jun-2003 to Jun-2008) this estimate is \$53.53 in 2008 dollars. Consistent with our evaluation framework in the previous section, this estimate assumes that an angler targeting red snapper for additional days due to a longer season previously used those days to take trips for another species (dolphin, grouper, or king mackerel) or did not fish at all.

The measures of constant producer surplus per trip for charter and head boats comes from the “Response to the 7/10/09 Data Request for Amendment 17a to the Snapper-Grouper Fishery Management Plan of the South Atlantic, 7/27/2009.” For charter boat trips we use estimate number one of \$148 net revenue (cash flow) per angler and for head boat trips we use estimate number ten of \$49 per angler. Both of these estimates are in 2008 dollars.

Private and Charter Boats

The last item in the list of data requirements can be calculated for anglers fishing from charter and private boats using the angler intercept survey and estimates of total effort from the Marine Recreational Information Program (MRIP) and the Texas Parks and Wildlife Department (TPWD). For the states (Louisiana through Florida) covered by the MRIP, the difference in target trips for red snapper between the status quo and proposed seasons is the estimated target

trips in waves 3 and 4 (May through August 2009) times the proportion of those trips that occurred during the period between the close of the status quo season and the close of the proposed seasons.⁵ Similarly, for Texas the difference in target trips for red snapper between the status quo and proposed seasons is the estimated target trips in 2008 times the proportion of those trips that occurred during the period between the close of the status quo season and the close of the proposed seasons. The proportions for each of the proposed open season alternatives conditioned on the assumption regarding the average weight of red snapper are shown in Table 2 and Table 3.

Using the MRIP estimates and methods described by Holiman (1996), the 2009 target effort for red snapper in Louisiana, Mississippi, Alabama, and Florida from private and charter boats was 279,033 and 62,038, respectively. The TPWD does not have estimates of total effort for 2009, nor does the department have estimates of target effort for red snapper. We calculate red snapper target effort for Texas as the total effort for the most recent year available (2008) times the most recent (2003) information on the proportion of anglers that reported targeting red snapper (Tables F.9 and G.9 from Green and Campbell 2005). Calculating red snapper target effort this way for Texas while weighting by the (2003) proportion targeting red snapper in the state versus federal waters gives 8,636 ($.082 \times 43,235 + .268 \times 18,994$) private boat trips and 849 ($0 \times 4,254 + .375 \times 2,264$) charter boat trips fishing for red snapper from Texas. Adding across all states in the Gulf of Mexico yields a total of 287,669 private boat trips targeting red snapper and 62,887 charter boat trips targeting red snapper.

Head Boats

Estimates of target trips for the anglers fishing from head boats are not available, so a different strategy is employed. The strategy follows the methods used in Appendix A of the ECA and estimates changes in aggregate head boat angler days using the Gulf of Mexico (Gulf) Head Boat Effort Response model (HBERM) documented in Carter and Letson (2009). This forecasting model was estimated using monthly data from 1986 to 2003 on aggregate head boat angler days, red snapper harvest, and red snapper regulations in Gulf. The model also included controls for climate conditions, income, and energy prices. For the purposes of this analysis, monthly head boat angler days were forecasted from 2004 to 2009 using actual values of the climate, income, energy prices, and red snapper regulations for this period.⁶ Note that, at the time of this analysis, there was not enough information on the forecasted values of the exogenous model variables for 2010. Therefore, all of the policy forecasts described below are based on the model forecasts of monthly angler days for 2009. This assumes that 2010 will be like 2009.

It is important to note that, although the HBERM accurately forecasts the actual monthly angler days in 2009, the forecasts are not perfect. The difference between the actual and forecasted angler days is the forecast error of the model for each monthly observation. This forecast error also persists in the policy forecasts so as long as the forecast error is not affected by the changes

⁵ The recreational red snapper fishing season in 2009 was longer than the “status quo” season and any of the proposed fishing seasons for 2010.

⁶ Values for two of the climate variables, ACE and Bermuda High, were not available for the periods from 2008 to 2009 and 2006 and 2009, respectively. Historic monthly averages were used in place of these missing monthly observations.

in the seasons, then the difference between two policy forecasts should be free of error; i.e., the forecast errors cancel out.

Results

The estimated change in trips for private and charter boats are shown in Table 4 through Table 6. For head boats, we focus on the difference between the trips forecasted in July 2009 under the Status quo and the two policy alternatives under the different assumptions regarding the average weight of red snapper. The HBERM forecasts the following results:

- An additional 3,052 trips will be taken in July under the season that ends on July 30th, instead of July 10th (Alternative 2, no change in average red snapper weight)
- An additional 1,624 trips will be taken in July under the season that ends on July 21st, instead of July 10th (Alternative 3, no change in average red snapper weight)
- An additional 2,458 trips will be taken in July under the season that ends on July 21st, instead of July 4th (Alternative 2, 15% increase in average red snapper weight)
- An additional 1,266 trips will be taken in July under the season that ends on July 13th, instead of July 4th (Alternative 3, 15% increase in average red snapper weight)

The estimated change in consumer surplus for all modes using equation (1) is shown in Table. The estimated change in producer surplus using equation (2) and for charter and head boats is shown in Table 3.

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Table 1. Proposed Policies

Scenario	Quota	Season	Days
<i>--Average Weight of Red Snapper Same as 2009--</i>			
Status quo	2	Jun 1 - Jul 10	40
Alternative 2	3	Jun 1 - Jul 30	60
Alternative 3	3	Jun 1 - Jul 21	51
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>			
Status quo	2	Jun 1 - Jul 4	34
Alternative 2	3	Jun 1 - Jul 21	51
Alternative 3	3	Jun 1 - Jul 13	43

Table 2. Proportion of the 2009 Red Snapper Target Trips in May through August that Occurred Between the End of the Status Quo Season and the End of the Proposed Seasons: LA-WFL

Scenario	Private Boats	Charter Boats
<i>--Average Weight of Red Snapper Same as 2009--</i>		
Alternative 2: Jul 10 – Jul 30	19.76	17.63
Alternative 3: Jul 10 – Jul 21	13.37	15.20
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>		
Alternative 2: Jul 4 – Jul 21	19.15	18.84
Alternative 3: Jul 4 – Jul 13	12.46	13.37

Source: 2009 MRIP Angler Intercept Survey

Table 3. Proportion of the 2008 Red Snapper Target Trips in May through August that Occurred Between the End of the Status Quo Season and the End of the Proposed Seasons: TX

Scenario	Private Boats	Charter Boats
<i>--Average Weight of Red Snapper Same as 2009--</i>		
Alternative 2: Jul 10 – Jul 30	27.71	37.23
Alternative 3: Jul 10 – Jul 21	21.60	21.28
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>		
Alternative 2: Jul 04 – Jul 21	23.36	21.28
Alternative 3: Jul 04 – Jul 13	2.26	6.38

Source: 2008 TPWD Creel Survey

Table 4. Estimated 2009 Red Snapper Target Trips that Occurred Between the End of the Status Quo Season and the End of the Proposed Seasons: LA-WFL

Scenario	Private Boats	Charter Boats	Total
<i>--Average Weight of Red Snapper Same as 2009--</i>			
Alternative 2: Jul 10 – Jul			
30	55,137	10,937	66,074
Alternative 3: Jul 10 – Jul			
21	37,307	9,430	46,736
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>			
Alternative 2: Jul 04 – Jul			
21	53,435	11,688	65,123
Alternative 3: Jul 04 – Jul			
13	34,768	8,294	43,062

Table 5. Estimated 2008 Red Snapper Target Trips that Occurred Between the End of the Status Quo Season and the End of the Proposed Seasons: TX

Scenario	Private Boats	Charter Boats	Total
<i>--Average Weight of Red Snapper Same as 2009--</i>			
Alternative 2: Jul 10 – Jul			
30	2,393	316	2,709
Alternative 3: Jul 10 – Jul			
21	1,865	181	2,046
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>			
Alternative 2: Jul 4 – Jul			
21	2,017	181	2,198
Alternative 3: Jul 4 – Jul			
13	195	54	249

Table 6. Estimated 2009 Red Snapper Target Trips that Occurred Between the End of the Status Quo Season and the End of the Proposed Seasons: Gulf of Mexico

Scenario	Private Boats	Charter Boats	Total
<i>--Average Weight of Red Snapper Same as 2009--</i>			
Alternative 2: Jul 10 – Jul 30	57,530	11,253	68,784
Alternative 3: Jul 10 – Jul 21	39,172	9,610	48,782
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>			
Alternative 2: Jul 4 – Jul 21	55,452	11,869	67,321
Alternative 3: Jul 4 – Jul 13	34,963	8,349	43,311

Table 7. Estimated Change in Consumer Surplus between the Status Quo Season and Proposed Seasons (2008 dollars, rounded to nearest thousand)

Scenario	Private Boats	Charter Boats	Head Boats	Total
<i>--Average Weight of Red Snapper Same as 2009--</i>				
Alternative 2	\$3,080,000	\$602,000	\$163,000	\$3,845,000
Alternative 3	\$2,097,000	\$514,000	\$87,000	\$2,698,000
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>				
Alternative 2	\$2,968,000	\$635,000	\$132,000	\$3,735,000
Alternative 3	\$1,872,000	\$447,000	\$68,000	\$2,386,000

Table 8. Estimated Change in Producer Surplus between the Status Quo Season and Proposed Seasons (2008 dollars, rounded to nearest thousand)

Scenario	Head Boats	Charter Boats	Total
<i>--Average Weight of Red Snapper Same as 2009--</i>			
Alternative 2	\$150,000	\$1,666,000	\$1,815,000
Alternative 3	\$80,000	\$1,422,000	\$1,502,000
<i>--Average Weight of Red Snapper 15% greater than 2009--</i>			
Alternative 2	\$120,000	\$1,757,000	\$1,877,000
Alternative 3	\$62,000	\$1,236,000	\$1,298,000