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Final

Regulatory Amendment to the

Reef Fish Fishery Management Plan

To Set Recreational

Management Measures for Grouper

Starting in 2006

(including EA, RIR, IRFA)



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Acronyms/Abbreviations Used in this Document

ABC	Allowable Biological Catch
ALS	Accumulated Landings System
B _{MSY}	Biomass at MSY
CEQ	Council on Environmental Quality
Council	Gulf of Mexico Fishery Management Council
CPUE	Catch per Unit Effort
CZMA	Coastal Zone Management Act
DWG	Deep-Water Grouper
ESA	Endangered Species Act
EA	Environmental Assessment
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FR	Federal Register
FWC	Florida Fish and Wildlife Conservation Commission
GMFMC	Gulf of Mexico Fishery Management Council
GOM	Gulf of Mexico
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistics Survey
MP GW	Million Pounds Guttled Weight
M-SFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NMFS	NOAA Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OY	Optimum Yield
RFSAP	Reef Fish Stock Assessment Panel
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office, NOAA
SSB	Spawning Stock Biomass
SWG	Shallow-Water Grouper
TAC	Total Allowable Catch

Executive Summary

The Council initiated this regulatory amendment in fall 2004 to adjust the Total Allowable Catch (TAC) and management measures necessary to maintain the rebuilding schedules specified in Secretarial Amendment 1. However, because of landings overages in the recreational fishery, the Council decided to maintain the existing red grouper TAC of 6.56 million pounds gutted weight (MP GW) until a new stock assessment is completed.

This regulatory amendment originally contained both commercial and recreational management measures. However, the Council voted to split commercial and recreational actions into two regulatory amendments at their October 2005 meeting. The Council approved a regulatory amendment for commercial trip limits in October 2005 for submission to the Secretary. The Council deferred action on recreational management actions until the November 2005 Council meeting, necessitating development of this regulatory amendment.

Secretarial Amendment 1 to the Reef Fish Fishery Management Plan was implemented by NOAA Fisheries Service (NMFS) on July 15, 2004, and established a rebuilding plan, a 5.31 MP GW commercial quota, and a 1.25 MP GW recreational target catch level for red grouper. In March 2005, the Council requested NMFS implement interim regulations for the recreational red grouper fishery to return landings to levels specified in Secretarial Amendment 1. Recreational landings in 2003 were only slightly greater than the target catch level and totaled 1.35 MP GW (Figure 1). In 2004, recreational landings were well above the recreational target catch level and totaled 3.18 MP GW. Without interim regulations, the Council expected recreational red grouper landings in 2005 to continue to exceed the 1.25 MP GW recreational target catch level. NMFS implemented interim regulations to reduce recreational grouper landings in August 2005. These regulations expire in January 2006, but may be extended for an additional 180 days. The purpose of this regulatory amendment is to establish more permanent management measures for the recreational grouper fishery. New or adjusted management measures are needed if the Council intends to return recreational red grouper landings to levels specified in the rebuilding plan and prevent or minimize impacts on gag and other grouper resulting from more restrictive recreational red grouper regulations. Actions considered in this regulatory amendment include changes to recreational management measures, such as bag limits, size limits, vessel limits, and closed seasons.

Actions and management alternatives considered by the Council to address recreational overages and impacts on other grouper are described in Section 3. The following provides a brief summary of each action and the various alternatives considered by the Council, including the Council's preferred alternatives.

Action 1: Recreational Red Grouper Landings Limits

The red grouper daily bag limit was reduced from five to two red grouper per person per day in July 2004. This bag limit is estimated to reduce recreational landings by 9 percent annually starting in 2005. Continued fishing under status quo regulations is expected to result in red grouper landings exceeding the recreational target catch level of 1.25 MP GW. Because a rebuilding plan has been established to end overfishing and rebuild the red grouper stock, the

Council must take steps to achieve adequate progress toward ending overfishing and rebuilding the stock, if the plan is not resulting in adequate progress [Section 304 (e)(7)(B)]. It is estimated that a 35 to 45 percent reduction in recreational red grouper landings is needed to return landings to levels specified in the rebuilding plan.

Alternatives considered in Action 1 by the Council include:

Alternative 1: Status quo/no action

Alternative 2: One red grouper daily bag limit, three red grouper daily vessel limit

Alternative 3: 22-inch total length (TL) minimum size limit

Alternative 4A: One red grouper daily bag limit, August grouper closed season

4B: One red grouper daily bag limit, April-May grouper closed season

Alternative 5: One red grouper bag limit, February 15-March 15 closed season for gag, black grouper, and red grouper (**Preferred**)

Alternative 6: One red grouper daily bag limit, 21-inch TL minimum size limit

Alternative 7: One red grouper daily bag limit or three red grouper vessel limit, whichever is less, except Reef Fish permitted for-hire vessels possessing a Coast Guard Certificate of Inspection may possess one red grouper per two paying passengers.

The Council has chosen **Alternative 5** as the preferred. **Preferred Alternative 5** is expected to reduce red grouper landings by 33 percent and reduce landings of gag and black grouper by 7 percent. The seasonal closure overlaps the commercial February 15 through March 15 closure for gag, red, and black grouper, making the closure more equitable to all users and possibly improving compliance. This proposed closure also includes important spawning seasons for all three species. Because red grouper are part of a multispecies fishery, prohibiting the landing of three species representing about 97 percent of recreationally caught grouper should reduce discard mortality during closed months and prevent effort from shifting to other grouper if only the red grouper fishery were closed.

Preferred Alternative 5 is expected to reduce consumer surplus by \$366,000 to \$404,000. If all affected trips are cancelled during the closed month, foregone expenditures associated with these trips are estimated to be as high as \$40 million. However, since fishing for alternative species would still be possible during the closed month, not all affected trips would be cancelled and foregone expenditures would be less than estimated.

Action 2: Recreational For-Hire Captain and Crew Daily Bag Limits

The intent of Action 2 is to achieve additional reductions in grouper landings by prohibiting captain and crew from retaining daily bag limits of grouper.

Alternatives considered in Action 2 by the Council include:

Alternative 1: Status quo/no action; allow captain and crew to retain grouper daily bag limits

Alternative 2: Do not allow captain and crew to retain grouper daily bag limits (**Preferred**).

The Council has selected **Alternative 2** as their preferred alternative. **Preferred Alternative 2** would prevent captain and crew from supplementing their client's landings once their client's daily bag limits have been met. This alternative would also eliminate the benefits captains and crew receive from fishing themselves while operating a for-hire trip and the benefits of taking fresh fish home from these trips. **Preferred Alternative 2** is expected to result in small reductions in overall recreational red grouper landings (< 1 percent). If the Council does not reduce the daily bag limit for red grouper or the aggregate daily grouper bag limit, then **Preferred Alternative 2** would likely have little effect on reducing grouper landings because few trips on average harvest more than the allowable bag limits. If the Council reduces the red grouper bag limit to one (see **Action 1, Preferred Alternative 5**), then the incentive to for captain and crew to supplement the catch of their clients may be higher than under current conditions.

Action 3: Recreational Aggregate Grouper Daily Bag Limit

The intent of Action 3 is to slow or prevent a shift in effort from red grouper to other grouper as a result of any actions to reduce the landings of red grouper. The recreational grouper fishery lands primarily two species of shallow-water grouper; gag represents about 63 percent of the landings while red grouper represents 34 percent of the landings. Although not considered to be overfished or undergoing overfishing based on the results of the last stock assessment (Turner, et al. 2001), gag are considered fully utilized and total landings since 2000 have been above the recommended allowable biological catch (RFSAP 2001).

Alternatives considered in Action 3 by the Council include:

- Alternative 1: Status quo/no action; five grouper aggregate daily bag limit (**Preferred**)
- Alternative 2: Four grouper aggregate daily bag limit
- Alternative 3: Three grouper aggregate daily bag limit
- Alternative 4: Two grouper aggregate daily bag limit

The Council has chosen **Alternative 1** as the preferred alternative. This alternative would maintain the five fish aggregate grouper bag limit implemented by Amendment 1 to the Reef Fish Fishery Management Plan. The Council expects Preferred Alternative 5 in Action 1 (closing February 15 to March 15 to gag, black grouper, and red grouper and reducing harvest of gag and black grouper by approximately seven percent) will be sufficient to compensate for any increase in harvest of gag or black grouper during the remaining open season and for increases in red grouper bycatch due to the one red grouper bag limit.

The potential environmental consequences of each alternative within each action are illustrated in the following table. For a full discussion of the environmental consequences see Section 7. A plus (+) indicates an overall positive benefit, a minus (-) an overall negative impact and “na” represents no identified impact or not applicable.

Summary of Environmental Consequences											
		Preferred	Physical	Biological	Economic	Social	Administrative	Mitigation	Cumulative	Unavoidable	Irreversible Irrecoverable
Action 1											
Alt. 1	Status Quo/No Action		na	-	na	-	na	na	-	na	na
Alt. 2	Bag 1 / vessel 3		na	+	-	+	-	na	+	-	na
Alt. 3	22 inches		na	+	-	+	na	na	+	-	na
Alt. 4A	Bag 1 / August		na	+	-	-	-	na	+	-	na
Alt. 4B	Bag 1 / April-May		na	+	-	-	-	na	+	-	na
Alt. 5	Bag 1 / Feb15-Mar15	X	na	+	-	-	-	na	+	-	na
Alt. 6	Bag 1 / 21 inches		na	+	-	+	na	na	+	-	na
Alt. 7	Bag 1 / vessel 3 / COI 1/2		na	+	-	+	-	na	+	-	na
Action 2											
Alt. 1	Status Quo/No Action		na	-	na	na	na	na	-	na	na
Alt. 2	No Capt/Crew bag	X	na	+	na	-	na	na	+	-	na
Action 3											
Alt. 1	Status Quo/No Action	X	na	-	na	na	na	na	-	na	na
Alt. 2	4 grouper aggregate		na	+	-	na	na	na	+	-	na
Alt. 3	3 grouper aggregate		na	+	-	na	na	na	+	-	na
Alt. 4	2 grouper aggregate		na	+	-	na	na	na	+	-	na

Environmental Assessment (EA) Cover Sheet

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Name of Action

Regulatory Amendment to the Reef Fish Fishery Management Plan to Set Recreational Management Measures for Grouper Starting in 2006.

Type of Action

Administrative
 Draft

Legislative
 Final

Summary

Secretarial Amendment 1 to the Reef Fish Fishery Management Plan was implemented by NOAA Fisheries Service (NMFS) on July 15, 2004, and established a rebuilding plan, a 5.31 MP GW commercial quota, and a 1.25 MP GW recreational target catch level for red grouper. In March 2005, the Council requested NMFS implement interim regulations for the recreational red grouper fishery to return landings to levels specified in Secretarial Amendment 1. Recreational landings in 2003 were only slightly greater than the target catch level and totaled 1.35 MP GW. In 2004, recreational landings totaled 3.18 MP GW. Without interim regulations, the Council expected recreational red grouper landings in 2005 to continue to exceed the 1.25 MP GW recreational target catch level. In August 2005, NMFS implemented interim regulations to reduce recreational grouper landings. These regulations expire in January 2006, but may be extended for an additional 180 days. The purpose of this regulatory amendment is to establish more permanent management measures for the recreational grouper fishery. New or adjusted management measures are needed if the Council intends to return recreational red grouper landings to levels specified in the rebuilding plan and prevent or minimize impacts on gag and other grouper resulting from more restrictive recreational red grouper regulations. Alternatives considered in this regulatory amendment included changes to recreational management measures, such as bag limits, size limits, vessel limits, and closed seasons.

Fishery Impact Statement / Social Impact Analysis (FIS/SIA)

Regulations impose restrictions on fishery participants, which can result in adverse effects on fishermen and fishing communities. This FIS/SIA evaluates the effects of changes to recreational management measures, such as bag limits, vessel limits, closed seasons, and size limits. These restrictions are intended to return recreational red grouper landings to levels specified in the rebuilding plan, and prevent or reduce effort shifts to other grouper resulting from more restrictive red grouper management measures.

Status quo management of the recreational red grouper fishery would maintain existing regulations and likely lead to continued recreational landing overages. Status quo management of the aggregate grouper fishery, in conjunction with more restrictive management of red grouper, may result in excessive stress to other grouper species as a result of redirected effort. Maintaining the status quo (no action) would likely require more restrictive management in the future; inducing foregone benefits and imposing greater adverse socioeconomic impacts than would accrue to management attention at this time.

Action 1 considers reducing the red grouper recreational daily bag limit, establishing a red grouper vessel limit, establishing a seasonal closure for the entire grouper fishery, establishing a seasonal closure for red grouper, gag, and black grouper, increasing the red grouper minimum size limit, and various combinations of each of these alternatives. All alternatives under Action 1 would result in short term reductions in consumer surplus and may result in trip cancellation and reduction in expenditures to the directed sectors and associated industries and communities. All losses, however, are expected to be less than those that would occur in the longer term as a result of delay in returning the fishery to the necessary landing conditions.

Among the seven alternatives under Action 1, Alternatives 2 and 7 would reduce the red grouper daily bag limit to one and establish red grouper vessel limits. These alternatives would result in the smallest reductions in consumer surplus and fewest trips impacted of any of the alternatives considered. Alternatives 3 and 6 would increase the red grouper minimum size limit and Alternative 6 would reduce the red grouper daily bag limit to one. These alternatives would affect more trips than Alternatives 2 and 7, but less trips than alternatives that include closed seasons. Reductions in consumer surplus resulting from Alternatives 3 and 6 are expected to be similar to or slightly greater than Alternatives 2 and 7. Alternatives 4A, 4B, and 5 would reduce the red grouper daily bag limit to one and implement a one or two month closure for either all grouper or black, gag, and red grouper. Preferred Alternative 5 would result in smaller losses in consumer surplus and less forgone expenditures when compared to Alternatives 4A-B. Preferred Alternative 5 is expected to reduce short-term consumer surplus in the recreational fishery by \$506,000-\$680,000 due to red grouper landing reductions. If all affected anglers cancel their fishing trips during the proposed closed period, foregone expenditures associated with these trips would be as high as \$40 million annually.

Action 2 considers eliminating the captain and crew recreational bag limits for grouper. Alternative 1 would maintain status quo regulations, allowing business and social patterns to remain unchanged at least in the short term. Preferred Alternative 2 is expected to increase the

likelihood that landing reduction targets for red grouper are met and could result in some small additional reductions in landings. Preferred Alternative 2 would eliminate the benefits that captains and crew receive from personally fishing and retaining the catch while operating a for-hire trip. Since the cost of acquiring fish during a for-hire trip is largely paid for by the paying passengers, this source of food is basically free and having to replace this food with other sources would increase their food expenditures.

Action 3 considers reducing the aggregate grouper recreational daily bag limit. Among the aggregate grouper daily bag limit alternatives for Action 3, the landing and bycatch protections for grouper species afforded by Alternatives 2-4 are believed to be un-necessary when considered in conjunction with Action 1, Preferred Alternative 5, which is expected to reduce harvest of gag and black grouper by approximately seven percent.

A more detailed analysis of the impacts on fishery participants and their communities is found in Sections 4, 5, and 7 herein.

1 INTRODUCTION

1.1 Background

Secretarial Amendment 1 to the Reef Fish FMP, implemented July 15, 2004, established a ten-year rebuilding plan for red grouper that began in 2003 (NMFS 2004a). The red grouper rebuilding plan is a stepwise plan with adjustments to total allowable catch (TAC) scheduled at three-year intervals. The schedule is based on the 2002 red grouper stock assessment using a spawner-recruit curve steepness coefficient of 0.7 and an assumed release mortality rate of 33 percent for the commercial fishery and 10 percent for the recreational fishery (SEFSC 2002). The following red grouper TACs were projected by the 2002 stock assessment to achieve B_{MSY} by 2012:

2003 - 2005	6.56 MP GW
2006 - 2008	7.23 MP GW
2009 - 2011	7.33 MP GW
2012+	7.39 MP GW (optimum yield for a fully recovered stock)

The Framework procedure for specification of TAC in Amendment 1 to the Reef Fish FMP states that commercial and recreational allocations of TAC will be based on historical percentages landed by each user group during the base period of 1979-1987. However, commercially landed grouper were not identified by species until 1986, so a red grouper allocation cannot be defined by this criterion. Secretarial Amendment 1 to the Reef Fish FMP (Section 6.4.1, Table 6.3) adopted the ratio of 81 percent commercial and 19 percent recreational based on 1999-2001 historical red grouper landings. Based on this ratio, the 6.56 MP GW yearly TAC for 2003-2005 was divided into a commercial quota of 5.31 MP GW and a recreational target catch level of 1.25 MP GW managed by bag and size limits.

At the October 11-14, 2004 meeting, the Council instructed staff to develop a regulatory amendment to adjust TAC for 2006 as specified in Secretarial Amendment 1. A red grouper stock assessment was not scheduled for completion under the Southeast Data, Assessment and Review (SEDAR) process until late 2006. However, it was expected that the regulations in Secretarial Amendment 1 would be sufficient to constrain catch and TAC could be increased until the new assessment was completed. The results could then be used to adjust TAC as necessary to rebuild the stock as required by the MSFCMA.

In early 2005, it became apparent that 2004 recreational landings of red grouper had exceeded the target catch level. Recreational landings during 2003 were slightly above the target catch level but the total catch (6.29 MP GW) remained below the annual TAC (Table 1.1). In 2004, recreational landings exceeded the target catch level by more than 1.9 MP GW and total landings were 8.43 MP GW, more than 1.87 MP GW above the annual TAC. Landings during 2003 – 2004 were 14.71 MP GW, or about 1.59 MP GW more than the allowable landings for the two-year period.

Table 1.1. Commercial and Recreational Red Grouper Landings, gutted weight in 1,000 of pounds. Charter vessel estimates using the new sampling methodology are in parentheses.						
Year	Commercial	Headboat	Charter	Private/Shore	TOTAL	
					Recreational	Grand
1986	6,475	124	313	1,909	2,346	8,821
1987	6,898	104	183	979	1,265	8,163
1988	4,894	105	238	2,149	2,493	7,387
1989	7,597	141	190	2,161	2,491	10,088
1990	4,938	119	454	822	1,396	6,334
1991	5,227	64	75	1,603	1,742	6,969
1992	4,345	66	333	2,542	2,941	7,286
1993	6,500	91	181	1,929	2,201	8,701
1994	4,967	70	238	1,660	1,968	6,935
1995	4,807	108	573	1,508	2,189	6,996
1996	4,506	104	179	677	959	5,465
1997	4,930	49	172	432	653	5,583
1998	4,026	56	187	514	757	4,783
1999	5,998	61	161	930	1,152	7,150
2000	5,898	67	201(699)	1,424	1,692(2,190)	7,590(8,088)
2001	6,014	49	267(351)	999	1,315(1,399)	7,329(7,413)
2002	5,948	39	329(298)	1,367	1,734(1,704)	7,682(7,652)
2003	4,939	51	449(261)	1,036	1,536(1,348)	6,475(6,287)
2004	5,241	119	?(561)	2,504	? (3,185)	? (8,426)

NOTE: 2004 estimates using the new charter methodology were updated in April but estimates using the old method were not available.

The reason for this increase is not clear, but historical trends in recreational red grouper landings provide two instances when landings in numbers of fish increased rapidly one year and then declined the following year. Landings increased 69 percent in 1992 and 90 percent in 2000 compared to landings during the previous year (Table 1.1). In the following years, 1993 and 2001, recreational landings declined 25 and 22 percent, respectively. Years of high landings and subsequent decline appear to be the result of strong year classes recruiting to the fishery (Lombardi-Carlson et al. 2002). In 2003, 20 -21 percent of measured red grouper were undersized (< 20 inches TL); lending evidence that the large increase in recreational landings during 2004 may be the result of another strong year-class recruiting to the fishery. Non-standardized nominal catch rates also increased between 2002 and 2004 (NMFS 2005a), potentially indicating increased availability; although these catch rates were similar to catch rates observed in 2000. These patterns have not been standardized relative to time, area or other factors known to influence catch rates and thus may be misleading with regard to the degree of improvement in the stock. Public testimony from recreational fishermen and Alabama state representatives during several Council meetings in late 2004 indicated that red grouper were more plentiful in the Florida Panhandle and Alabama in 2004.

During the March 7-10, 2005, Council meeting in Birmingham, Alabama, the Council reviewed recreational red grouper landings provided by NMFS and passed a motion requesting NMFS implement an interim rule to reduce 2005 recreational red grouper landings. A March 16, 2005,

letter to the Southeast Regional Office (SERO) Regional Administrator from the Council requested NMFS expedite the interim rule as quickly as possible so that it will take effect in July 2005, or as soon as possible thereafter. That rule became effective on August 9, 2005. The interim rule reduced the red grouper daily bag limit to one, reduced the aggregate grouper daily bag limit to three, and established a recreational closed season for all grouper from November 1 to December 31, 2005. NMFS was sued shortly after implementation of the temporary rule, and on October 31, 2005, a court decision concluded interim measures could only be applied to grouper species undergoing overfishing. Based on the court decision, interim regulations were modified as follows: 1) The aggregate grouper bag limit was increased from three to five fish per person per day, and 2) only red grouper were prohibited from being harvested during November-December 2005. The interim rule expires January 23, 2006, but may be renewed for an additional 180 days.

1.2 History of Management

The following summary describes only those management actions that affected grouper harvest. For a complete history of management of the entire reef fish fishery, please go to the Council's website: <http://www.gulfcouncil.org/>

The Reef Fish FMP, including an EIS, was implemented in November 1984. The regulations, designed to rebuild declining reef fish stocks, included prohibitions on the use of fish traps, roller trawls, and powerhead-equipped spear guns within an inshore stressed area and directed NMFS to develop data reporting requirements in the reef fish fishery.

Amendments

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

- Set a 20-inch total length minimum size limit on red, Nassau, yellowfin, black, and gag grouper;
- Set a 50-inch total length minimum size limit on jewfish (goliath grouper);
- Set a five-grouper recreational daily bag limit;
- Set an 11.0 MP commercial quota for grouper, with the commercial quota divided into a 9.2 MP shallow-water grouper (SWG) quota and a 1.8 MP deep-water grouper (DWG) quota. Shallow-water grouper were defined as black grouper, gag, red grouper, Nassau grouper, yellowfin grouper, yellowmouth grouper, rock hind, red hind, speckled hind, and scamp (until the SWG quota was filled). Deep-water grouper were defined as misty grouper, snowy grouper, yellowedge grouper, warsaw grouper, and scamp once the SWG quota was filled. Jewfish (goliath grouper) was not included in the quotas;
- Allowed a two-day possession limit for charter vessels and headboats on trips that extend beyond 24 hours, provided the vessel has two licensed operators aboard as required by the U.S. Coast Guard, and each passenger can provide a receipt to verify the length of the

trip. All other fishermen fishing under a bag limit were limited to a single day possession limit;

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

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

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

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

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

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

Extended the stressed area to the entire Gulf coast; and

Established a commercial reef fish vessel permit.

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

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

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

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

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

Amendment 18A (SEIS/RIR/IRFA) was approved by the Council at the October 2005 Council meeting for submission to the Secretary. This amendment addresses: 1) maximum crew size on charter vessels while commercially fishing, 2) use of reef fish for bait, 3) vessel monitoring systems for commercial reef fish vessels, 4) simultaneous commercial and recreational harvest on a vessel, 5) changes to the TAC framework procedure, and 6) sea turtle/smalltooth sawtooth sawfish bycatch mortality measures.

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

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

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

Amendment 22 (SEIS/RIR/IRFA), implemented July 5, 2005, specified bycatch reporting methodologies for the reef fish fishery.

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

Amendment 25 (SEIS/RIR/IRFA) was approved by the Council at their August 2005 meeting for submission to the Secretary. If implemented, the amendment would replace the reef fish for-hire permit moratorium that expires in June 2006 with a permanent limited access system.

Regulatory Amendments

A July 1991 regulatory amendment, implemented November 12, 1991, provided a one-time increase in the 1991 quota for SWG from 9.2 MP to 9.9 MP to provide the commercial fishery an opportunity to harvest 0.7 MP that went unharvested in 1990.

A November 1991 regulatory amendment, implemented June 22, 1992, raised the 1992 commercial quota for SWG to 9.8 MP after a red grouper stock assessment indicated that the red

grouper SPR was substantially above the Council's minimum target of 20 percent.

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

An October 2005 regulatory amendment, if implemented, would establish a 6,000-pound GW aggregate deep-water and shallow-water grouper trip limit for the commercial grouper fishery starting in 2006.

Secretarial Amendments

Secretarial Amendment 1, implemented July 15, 2004, established a rebuilding plan, a 5.31 MP GW commercial quota, and a 1.25 MP GW recreational target catch level for red grouper. The amendment also reduced the commercial quota for SWG from 9.35 to 8.8 MP GW and reduced the commercial quota for DWG from 1.35 to 1.02 MP GW. The recreational bag limit for red grouper was also reduced to two fish per person per day.

Control Date Notices

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

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

November 18, 1998 - The Council is considering whether there is a need to impose additional management measures limiting entry into the recreational-for-hire (i.e., charter vessel and

headboat) fisheries for reef fish and coastal migratory pelagic fish in the EEZ of the Gulf of Mexico and, if there is a need, what management measures should be imposed. Possible measures include the establishment of a limited entry program to control participation or effort in the recreational-for-hire fisheries for reef fish and coastal migratory pelagics. [63 FR 64031] (In Amendment 20 to the Reef Fish FMP, a qualifying date of March 29, 2001, was adopted.)

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

2 PURPOSE AND NEED

The purpose of this regulatory amendment is to set regulatory management measures for the Gulf of Mexico red grouper fishery to return red grouper landings to levels specified in the red grouper rebuilding plan, and prevent or minimize impacts on gag and other grouper resulting from more restrictive recreational red grouper regulations. The Council initiated this regulatory amendment in fall, 2004 to adjust TAC and management measures necessary to maintain the rebuilding schedules specified in Secretarial Amendment 1. However, because of landings overages in the recreational fishery, the Council decided to maintain the existing TAC of 6.56 MP GW until a new stock assessment is completed in late 2006.

Temporary management measures specifying a one red grouper daily bag limit within a three grouper aggregate daily bag limit, and a seasonal closure from November 1 through December 31, 2005, for the recreational grouper fishery were implemented by NMFS through interim regulations in August 2005. On October 31, 2005, these interim regulations were modified based on the results of a court decision; the aggregate grouper bag limit was increased from three to five fish per person per day, and only red grouper were prohibited from being harvested during November-December 2005. This interim rule will expire January 23, 2006, unless it is extended for an additional 180 days. These measures are intended to reduce 2005 recreational landings of red grouper to levels closer to the target catch level of 1.25 MP GW specified in Secretarial Amendment 1 to the Reef Fish FMP. The Council needs to implement additional management measures for 2006 onward to return recreational red grouper landings to levels specified in the rebuilding plan. It is estimated that a 35 to 45 percent reduction in recreational landings is needed to eliminate recreational overages.

3 MANAGEMENT ALTERNATIVES

Target Reductions for 2006 - 2008

Landings over the past five years (2000-2004) have varied from as low as 1.35 MP GW to as high as 3.18 MP GW (Table 1.1). The MRFSS for-hire survey methodology was improved starting in 2000, so this time frame represents the most recent series under consistent sampling techniques. The two-fish daily bag limit was implemented by Secretarial Amendment 1 in July 2004 and was expected to reduce recreational landings by 9 percent annually. However, Florida did not implement compatible regulations until January 2005; so the target reductions estimated from 2000 through 2004 landings do not include the effect of the two-fish daily bag limit. Average recreational landings for various time series using increasingly more recent years and the percent reduction necessitated by those averages are provided in Table 3.1. Percent reductions needed to eliminate recreational overages range from 34.5 to 44.9 percent, depending on the time-series chosen.

Table 3.1 Estimated percent reductions necessary to bring the recreational catch to 1.25 MP GW		
Time Series	Avg. Landings	Percent Reduction
2000-2004	1,965,100	36.4%
2001-2004	1,908,911	34.5%
2002-2004	2,078,727	39.9%
2003-2004	2,266,600	44.9%
Target Catch	1,250,000	

Recreational landings for 2005 are not yet available. Preliminary 2005 red grouper MRFSS landings for waves 1-4 (1,170,255 pounds GW) are 54 percent less than comparable wave 1-4 landings during 2004 (2,536,105 pounds GW), but greater than average wave 1-4 landings during 2001 – 2003 (1,313,278 pounds GW). Regression analyses of MRFSS landings in weight from both 1995 through 2004 and 2000 through 2004, suggest that combined wave 1-4 landings are a good predictor of annual landings (Strelcheck 2005a). MRFSS 2005 annual landings are projected to be between 1.45 and 1.52 MP GW without the reductions imposed by the red grouper interim rule (NMFS, 2005d). Headboat landings for 2005 were predicted to be about 60,000 pounds GW and total recreational landings for 2005 are predicted to be approximately 1.51-1.58 MP GW without the reductions imposed by the red grouper interim rule during August through December. These predicted landings are lower than the range of landings and estimated reductions summarized in Table 3.1, but still above the recreational target catch level.

Definitions and Concepts:

The following discussions provide background information on the types of management measures considered by the Council for limiting recreational red grouper landings. The included tables provide the basis for the proposed alternatives. A more complete discussion of the methods and assumptions used to generate these tables is presented in Strelcheck 2005b, c, and

d. Release mortality is not considered in these analyses because the purpose of the reductions is to reduce recreational landings to 1.25 MP GW as specified in the rebuilding plan implemented by Secretarial Amendment 1 to the Reef Fish FMP. Release mortality would have been considered if the goal of the reductions was to reduce fishing mortality (F); however, no information is available on the current value of F.

Bag and vessel limits: The recreational daily bag limit changed on July 15, 2004, from an aggregate daily bag limit of five fish per person of which all could be red grouper to two red grouper per person within the five-grouper aggregate; however, Florida did not implement compatible regulations until January 2005. The red grouper interim rule established a one fish daily bag limit, which began August 9, 2005. A two fish daily bag limit is expected to reduce the landings by 9 percent as was described in Secretarial Amendment 1 (Table 3.2). A one fish daily bag limit is estimated to decrease recreational landings in 2006 by 29.7 percent. MRFSS private and charter modes will be impacted far more than headboats by a one fish daily bag limit. Headboats passengers, on average, rarely catch more than one red grouper and only four percent of the annual recreational landings are from headboats.

Table 3.2 Estimated percent reduction in 2006 landings of red grouper numbers for various vessel limits. Source data: MRFSS and Headboat logbooks 2003-2004.					
Bag Limit	Vessel Limit	Percent Reduction			
		Charter	Private	HB	All Modes
1	None	22.5	32.7	6.1	29.7
1	10	23.1	32.7	16.2	30.2
1	9	23.5	32.7	18.2	30.4
1	8	24.1	32.7	20.7	30.6
1	7	24.9	32.8	23.7	31.0
1	6	26.4	33.0	27.2	31.5
1	5	30.0	33.6	31.9	32.9
1	4	35.8	34.7	37.9	35.0
1	3	44.1	37.7	46.0	39.3
1	2	55.5	46.5	57.2	48.6
1	1	72.1	67.3	73.7	68.5
2	None	5.9	10.4	0.9	9.1
2	10	10.8	10.6	14.9	10.8
2	9	12.7	11.1	17.1	11.7
2	8	15.0	11.7	19.8	12.7
2	7	18.1	13.3	22.9	14.6
2	6	22.3	15.3	26.7	17.1
2	5	27.7	19.0	31.5	21.2
2	4	34.5	23.9	37.7	26.5
2	3	43.6	33.0	45.9	35.5
2	2	55.5	46.2	57.1	48.4

Reproduced from Strelcheck, 2005d.

Vessel limits are not normally considered for the recreational fishery but are in place for speckled hind and warsaw grouper (one per vessel per day). Using a red grouper vessel limit

provides more options for possession limit reductions since the daily bag limit can only be reduced to one (Table 3.2).

Under the existing daily bag limit of two red grouper, vessel limits affect headboats and charter vessels similarly while the private sector is affected less. Fishers from the private sector have individual catch rates similar to charter vessel passengers, but fewer anglers per trip, and therefore are generally less affected by vessel limits. Daily vessel limits greater than six combined with a one red grouper daily bag limit, affect the private sector most, followed by the charter vessel and headboat sectors. As the daily vessel limit is decreased to six or less, impact to the three sectors becomes similar. Headboats are only slightly affected by a one red grouper individual daily bag limit (6.1 percent reduction), but decreasing vessel limits restrict landings more rapidly.

Size limits: The recreational red grouper minimum size limit has been 20-inches TL since 1990. Strelcheck 2005c estimated reductions in landings resulting from increases to the size limit. The intent of all management measures is to reduce recreational landings in weight; however, this is the only management measure where percent reductions are different if measured by weight or numbers because smaller (and on average lighter) fish are being selectively removed from landings. For instance, increasing the minimum size limit to 22 inches TL should reduce landings in weight by about 32 percent and landings in numbers by 42 percent; while a 24-inch TL minimum size limit should reduce landings by about 54 percent in weight and 64 percent in numbers (Table 3.3). All modes of recreational fishing would be impacted similarly by any change to the red grouper size limit.

Table 3.3. Estimated reduction in red grouper landings in weight and numbers by mode for various size limits.

Size Limit	Estimated Reduction			
	Charter	Private	Headboat	All Modes
By Weight				
21"	16.5	14.0	14.7	14.5
22"	31.4	32.2	32.2	32.1
23"	43.9	44.8	44.8	44.6
24"	55.0	53.7	54.1	54.0
By Numbers				
21"	22.9	20.2	26.5	20.9
22"	40.8	42.6	42.2	42.2
23"	54.0	56.0	52.2	55.5
24"	64.0	64.4	60.5	64.2

Implementing a size limit above the smallest size currently caught or increasing an existing size limit increases regulatory discards because more fish must be released in order to catch a legal-sized fish. The estimated proportion of red grouper released under the current 20-inch TL red grouper minimum size is 88 percent; at ten percent release mortality, dead discards represent 42 percent of the total red grouper killed annually (Table 3.4). If the size limit is increased to 22-inches TL, discards would be expected to increase by about five percent and dead discards would increase to 57 percent of the total red grouper killed annually; however, the effective reduction in

total landings would only be about 22 percent. If the size limit is increased to 24-inches TL, landings would decline by almost 66 percent, dead discards would represent 70 percent of total landings, and the effective reduction in total landings would only be 33 percent. Nearly 50 percent of the expected reductions in landings from these size limit increases are negated by the increase in dead discards.

Table 3.4. Estimated annual discards of red grouper associated with various red grouper size limits. Source - 2003-2004 MRFSS data in numbers of fish. A = observed catch, B1 = unseen catch, and B2 = released fish					
Type of Catch	Size Limit				
	20	21	22	23	24
A + B1	354,893	281,430	204,773	157,572	126,697
% MRFSS reduction	0%	21%	42%	56%	64%
B2	2,603,123	2,676,586	2,753,243	2,800,443	2,831,319
% B2 of Total Catch	88%	90%	93%	95%	96%
B2 Dead	260,312	267,659	275,324	280,044	283,132
B2 Dead %	42.3%	48.7%	57.3%	64.0%	69.1%
Total Dead	615,205	549,088	480,097	437,617	409,829
Effective % Reduction	0.0%	10.7%	22.0%	28.9%	33.4%

Seasonal Closures: Landings reductions that would result from seasonal closures are similar for each sector of the recreational fishery with two exceptions; private landings are higher than charter vessel landings in July and August, but lower than charter vessel landings in September and October (Table 3.5). The greatest reductions in harvest occur during summer and early fall when landings and effort are greatest. Effort shifting is expected to occur with any seasonal closure but there are no data from which to estimate changes in landings that might occur before or after a proposed closure.

Table 3.5 Estimated reduction in red grouper landings in numbers for various seasonal closures. Source: MRFSS 2003-2004, Headboat 2003-2004				
	Charter	Private	Headboat	Weighted Total
Jan	2.8	3.4	7.1	3.4
Feb	2.8	3.4	5.7	3.4
Mar	5.9	7.2	12.4	7.1
Apr	5.9	7.2	7.5	6.9
May	13.9	12.2	10.3	12.4
Jun	13.9	12.2	11.8	12.5
Jul	12.7	16.8	9.0	15.8
Aug	12.7	16.8	8.5	15.8
Sep	10.8	6.3	4.0	7.0
Oct	10.8	6.3	9.8	7.2
Nov	3.9	4.1	6.7	4.2
Dec	3.9	4.1	7.0	4.2

Combination closures: As an example of percent reductions that could be attained by combining several management measures, Table 3.6 is reproduced from Strelcheck (2005d). Depicted are

the percent reductions based on a one red grouper daily bag limit, various daily vessel limits and various closed seasons. Percent reductions are based on reductions from charter, private, and headboat sectors weighted by their proportion of landings. Headboat landings represent only about four percent of all recreational landings; therefore, they have very little effect on the overall estimated recreational reductions. Likewise, private recreational landings represent about 77 percent of total recreational landings; therefore their individual proportional reductions have the most influence on the overall reductions in recreational landings.

TABLE 3.6. Estimated percent reductions in red grouper landings from a one red grouper bag limit, various season closures and various vessel limits. Source: MRFSS 2003-2004; Headboat Logbooks 2003-2004. Bolded values meet the target reduction percentage.

Closed Season	Vessel Limit										
	None	10	9	8	7	6	5	4	3	2	1
None	29.7	30.2	30.4	30.6	31.0	31.5	32.8	35.0	39.3	48.7	68.5
Feb	31.9	32.5	32.6	32.8	33.2	33.7	35.0	37.1	41.2	50.3	69.5
Jan	31.9	32.5	32.6	32.8	33.2	33.7	35.0	37.1	41.2	50.3	69.5
Dec	32.5	33.0	33.2	33.4	33.7	34.2	35.5	37.6	41.7	50.7	69.7
Nov	32.5	33.1	33.2	33.4	33.8	34.3	35.6	37.7	41.7	50.7	69.7
Feb15-Mar15	33.4	34.0	34.1	34.3	34.6	35.1	36.4	38.5	42.5	51.4	70.1
Mar	34.4	34.9	35.1	35.3	35.6	36.1	37.4	39.4	43.4	52.1	70.6
Apr	34.5	35.1	35.2	35.4	35.8	36.2	37.5	39.5	43.5	52.2	70.6
Jan-Feb	34.6	35.1	35.2	35.4	35.8	36.2	37.5	39.5	43.4	52.2	70.6
Sep	34.6	35.1	35.3	35.5	35.8	36.3	37.6	39.6	43.6	52.3	70.7
Feb-Mar15	34.7	35.2	35.3	35.5	35.8	36.3	37.6	39.6	43.5	52.2	70.7
Oct	34.7	35.2	35.4	35.6	35.9	36.4	37.7	39.7	43.6	52.3	70.7
Nov-Dec	35.6	36.1	36.3	36.5	36.8	37.3	38.5	40.5	44.3	52.9	71.1
Feb15-Mar	36.0	36.5	36.6	36.8	37.1	37.6	38.8	40.8	44.6	53.2	71.2
Feb-Mar	37.2	37.7	37.8	38.0	38.3	38.8	40.0	41.9	45.7	54.1	71.8
Oct-Nov	37.8	38.2	38.4	38.6	38.9	39.4	40.5	42.5	46.2	54.5	72.1
May	38.2	38.7	38.9	39.1	39.4	39.9	41.0	43.0	46.7	55.0	72.3
Jun	38.2	38.7	38.9	39.1	39.4	39.9	41.1	43.0	46.7	55.0	72.3
Mar-Apr	39.7	40.1	40.3	40.4	40.7	41.2	42.3	44.2	47.8	55.9	72.9
Sep-Oct	39.7	40.2	40.3	40.5	40.8	41.3	42.4	44.3	47.9	56.0	73.0
Aug	40.5	41.0	41.2	41.4	41.7	42.2	43.3	45.2	48.8	56.7	73.4
Jul	40.6	41.1	41.2	41.4	41.7	42.2	43.3	45.2	48.8	56.7	73.4
Apr-May	43.3	43.7	43.9	44.0	44.3	44.8	45.8	47.6	51.0	58.6	74.6
Aug-Sep	45.6	46.0	46.2	46.3	46.6	47.1	48.1	49.8	53.1	60.4	75.6
May-Jun	47.1	47.6	47.7	47.9	48.1	48.5	49.6	51.2	54.4	61.4	76.3
Jun-Jul	49.4	49.9	50.0	50.2	50.4	50.8	51.8	53.4	56.4	63.2	77.4
Jul-Aug	51.7	52.1	52.2	52.4	52.6	53.0	54.0	55.5	58.4	64.9	78.4

3.1 Action 1: Red Grouper Landings Limits

Alternative 1. Status quo/no action. The red grouper minimum size limit remains 20-inches TL and the recreational bag limit remains at 2 per person per day and is included as part of the grouper aggregate bag limit. Reduces red grouper landings by 9 percent.

Alternative 2. The red grouper recreational bag limit within the aggregate grouper bag limit is reduced to 1 per person per day or 3 per vessel per day whichever is less. Reduces red grouper landings by 39 percent.

Alternative 3. The red grouper recreational size limit is increased to 22-inches TL. Reduces red grouper landings by 32 percent.

Alternative 4. The red grouper recreational bag limit within the aggregate grouper bag limit is reduced to 1 per person per day and a closed season for all grouper is established during:

- A. August. Reduces red grouper landings by 40 percent.**
- B. April and May. Reduces red grouper landings by 43 percent.**

Preferred Alternative 5. The red grouper recreational bag limit within the aggregate grouper bag limit is reduced to 1 per person per day and a closed season for red, gag and black grouper is established during February 15 through March 15. Reduces red grouper landings by 33 percent.

Alternative 6. The red grouper recreational bag limit within the aggregate grouper bag limit is reduced to 1 per person per day and the recreational size limit is increased to 21-inches TL. Reduces red grouper landings by 40 percent.

Alternative 7. The red grouper recreational bag limit within the aggregate grouper bag limit is reduced to 1 per person per day or 3 per vessel per day whichever is less except for Reef Fish permitted for-hire vessels with Coast Guard COI permits which will have a vessel limit of 1 red grouper per 2 paying passengers. Reduces red grouper landings by 37 percent.

Discussion: Alternative 1 would continue to allow recreational anglers to land two red grouper and would maintain the 20-inch TL minimum size limit. The two-fish daily bag limit was implemented by Secretarial Amendment 1 in July 2004. Continued fishing under status quo (no action) regulations is expected to result in red grouper landings exceeding the recreational target catch level of 1.25 MP GW. No additional restrictions would be implemented to reduce either red grouper landings or the landings of other SWG and DWG. Continued overages would jeopardize the recovery of red grouper, requiring deviation from the rebuilding plan, more restrictive management measures, and delay in greater landings allowances that would be possible as the stock is rebuilt. However, if increases in landings are not due to increases in

fishing mortality, but rather to increases in recruitment (see Section 1.1 for a discussion), then more restrictive actions may not be necessary to rebuild the fishery. Maintaining existing regulations would not change bycatch in the short-term because **Alternative 1** does not change the methods or gears used for harvest. Currently, about 88 percent of all recreationally caught red grouper are released and it is estimated 42 percent of the total red grouper killed annually (landed fish + dead discards) die from release mortality (see Table 3.4).

Reductions in landings would only result from the recently implemented two-fish daily bag limit and non-regulatory actions, such as reductions in fishing effort and catch rates. Based on updated landings and intercept data since implementation of Secretarial Amendment 1, it is estimated the two red grouper daily bag limit will reduce red grouper landings by approximately 9 percent in 2005 when compared to 2003-2004 average landings (Table 3.2; Strelcheck 2005d). A two fish daily bag limit is expected to reduce recreational red grouper landings by approximately 38,000 to 70,000 fish, valued at \$140,000 to \$276,000 in consumer surplus. Recreational overages are likely to continue under **Alternative 1**. The effects of this alternative will have the smallest short-term economic and biological effects of any of the alternative considered.

Alternative 2 would maintain the 20-inch TL minimum size limit, reduce the red grouper daily bag limit from two to one red grouper per angler and implement a three fish daily vessel limit. A vessel would be limited to no more than three red grouper, regardless of how many anglers are on the vessel. **Alternative 2** is estimated to reduce recreational red grouper landings by 39 percent in 2006. A one fish daily bag limit would affect the private sector most, followed by the charter, and then the headboat sector. However, a three fish daily vessel limit in addition to the one-fish daily bag limit affects the private sector less than the headboat and charter vessel sectors. Additionally, fishers on all private sector trips and most charter vessel trips are part of a single small party; that is, they know each other and should be able to understand a vessel limit of one species and find an amenable way to share the total vessel catch if necessary. For those charter vessels trips that occasionally carry individual paying passengers, and for all headboat trips, a vessel limit of red grouper would be very difficult to share. Headboats have the largest number of anglers per trip and have a fairly high likelihood of exceeding the vessel limit when red grouper are caught.

This measure could result in increased fishing pressure and fishing mortality on other grouper if anglers and spear fishermen attempt to replace the red grouper they were previously allowed to keep with another grouper. Assuming hook-and-line anglers stop targeting red grouper once they have caught their one fish, bycatch would be expected to decrease. However, if hook-and-line anglers continue fishing for red grouper in an attempt to catch a larger red grouper (high grade), bycatch may not decrease. Because red grouper co-occur with other grouper species, this alternative may also increase red grouper bycatch if hook-and-line anglers fish for other grouper once reaching their red grouper bag or vessel limit.

Alternative 2 is expected to reduce recreational red grouper landings by approximately 23,000 to 88,000 more fish than **Alternative 1**, valued at \$95,000 to \$364,000 in consumer surplus. The short-term adverse economic impacts of **Alternative 2** would be less than any other alternative,

except status quo (no action). The reduction in landings should reduce the jeopardy to the red grouper rebuilding plan.

Alternative 3 would increase the minimum size limit for red grouper from 20- to 22-inches TL. It is estimated 2006 landings in weight would be reduced by 32 percent. However, increasing the size limit would contribute to about six percent more red grouper being released and dying when compared to status quo/no action (see Table 3.4). Because of increases in the number of fish released dead, the overall effectiveness of this alternative would be reduced by approximately 50 percent (see Table 3.4). The proposed increase in the minimum size limit could also result in foregone yield because there would be additional mortality from natural causes before fish reached legal size.

Alternative 3 is projected to reduce red grouper landings by approximately 41,000 to 100,000 more fish than **Alternative 1**, valued at \$138,000 to \$386,000 in consumer surplus which is more than **Alternative 2**, similar to **Alternatives 6** and **7** and less than any of the seasonal closure alternatives, including **Preferred Alternative 5**. The mortality associated with the release of undersized fish will likely reduce the benefits of decreasing landings, thereby slowing progress toward returning to the rebuilding path and not avoiding more restrictive management and accompanying adverse economic impacts. Similar concern is not as great under bag and seasonal adjustments since there is a greater expectation that targeted fishing will cease upon reaching the daily bag limit, and directed fishing will be reduced under seasonal closures, thereby reducing catch and release activity. Increased minimum size limits, conversely, directly affect the ability to reach the daily bag limit, inducing increased catch and release behavior.

Alternative 4A and **4B** would maintain the 20-inch TL minimum size limit, would reduce the red grouper daily bag limit from two to one red grouper per angler and establish a closed season for all grouper during either the month of August or the months of April and May. These alternatives are expected to reduce red grouper landings by 40 and 43 percent, respectively. The intent of the August closure (**Alternative 4A**) is to close the shortest time possible in conjunction with a one red grouper daily bag limit and meet the target landings reduction; the same reduction would have occurred if July had been selected, but the August closure avoids a major holiday (July 4). Other one-month closures could also meet the target landings reduction (Table 3.5).

Alternative 4B would establish the closed season during April and May to coincide with the peak spawning period for red grouper.

The season closures for these alternatives would include prohibition on possession of any grouper species. Because red grouper are part of a multispecies fishery, prohibiting the landing of all grouper should reduce discard mortality during closed months and prevent effort from shifting to other grouper if only the red grouper fishery were closed. Closures for all grouper should also have positive biological benefits on gag and other grouper by reducing landings by 8 and 19 percent respectively. Gag are currently not overfished or undergoing overfishing, but are considered to be fully utilized and landings since 2001 have been above the 2001 RFSAP's recommended ABC. Other SWG and DWG account for only 3.1 and 0.4 percent respectively of the annual grouper landings. Applying the grouper closed season gulf-wide would affect some anglers in the western Gulf where red grouper are rare, but only about two percent of annual

grouper landings are from the western Gulf. Grouper, with the possible exception of warsaw and yellowedge grouper; are not commonly targeted by western Gulf anglers. A Gulf-wide closure would not require a line of demarcation, which can cause some enforcement problems near the line and create confusion among anglers as to where it is or is not legal to fish. Non-grouper reef fishes, such as red and vermilion snapper, could be negatively affected by a closure if anglers target these species when the grouper fishery is closed.

Recreational anglers primarily use two types of fishing gear to harvest grouper: hook-and-line and spears. The overall proportion of landings accounted for by each of these geartypes is not known, but based on MRFSS intercepts hook-and-line accounts for most landings of grouper. Fishermen using hook-and-line would affect red grouper bycatch and could shift effort to other grouper and snapper that co-occur with red grouper. In comparison, spear fishermen can selectively choose what fish they harvest and therefore would not impact bycatch. However, spear fishermen can easily shift effort and selectively target other grouper and snapper while fishing. The proposed closed seasons in **Alternatives 4A-B** would prevent effort from shifting for all geartypes and would reduce bycatch from hook-and-line.

Alternative 4A is expected to reduce red grouper landings by approximately 64,000 to 231,000 more fish than **Alternative 1**, valued at \$259,000 to \$947,000 in consumer surplus. **Alternative 4B** is expected to reduce red grouper landings by approximately 162,000 to 281,000 more fish than **Alternative 1**, valued at \$605,000 to \$1,113,000 in consumer surplus. Additionally, when a season closure is established, there are expected to be forgone expenditures due to cancellation of fishing trips by both the for-hire and private sectors of the recreational fishery. Closed seasons are expected to affect net revenue from businesses including charter vessels and headboats, as well as the support industry for all recreational fishing (e.g. bait and tackle shops, fuel docks, marine ways, etc.). **Alternative 4A** and **4B** are expected to result in \$101 million and \$192 million in forgone expenditures (Table 7.3.19), assuming all trips are cancelled and not rescheduled for other times. The economic losses due to foregone expenditures are more than two orders of magnitude greater than the losses from consumer surplus. The economic impacts of **Alternatives 4A** and **B** are the highest of any of the alternatives regardless of which economic indicator is used.

Preferred Alternative 5 would maintain the 20-inch TL minimum size limit, reduce the red grouper daily bag limit to one fish per person, and implement a closed season for gag, red, and black grouper from February 15 through March 15. This alternative is expected to reduce red grouper landings by 33 percent and reduce landings of gag and black grouper by 7 percent. The seasonal closure overlaps the commercial February 15 through March 15 closure for gag, red, and black grouper, making the closure more equitable to all users and possibly improving compliance. This proposed closure includes important spawning seasons for all three species. Gag and red grouper spawn from December through May and peak spawning occurs from March through May for red grouper (Collins et al. 2002) and February through March for gag (Hood and Schlieder 1992). Black grouper spawn from October through March, but peak spawning times are unidentified (Crabtree and Bullock 1998).

Because red grouper are part of a multispecies fishery, prohibiting the landing of three species

representing about 97 percent of recreationally caught grouper should reduce discard mortality during closed months and prevent effort from shifting to other grouper if only the red grouper fishery were closed. The closure proposed in **Preferred Alternative 5** would prevent hook-and-line fisherman and spear fishermen from shifting effort to other species, and would reduce bycatch from hook-and-line. Closures for these grouper should also have positive biological benefits on gag and other grouper by reducing landings by about 7 percent. This reduction in gag and black grouper landings is expected to be sufficient to compensate for effort-shifting caused by the one red grouper bag limit during open seasons.

As mentioned above, gag are considered fully utilized and landings since 2001 have been above the 2001 RFSAP's recommended ABC. Applying the grouper closed season gulf-wide would affect some anglers in the western Gulf where red grouper infrequently occur and black grouper do not occur. A Gulf-wide closure would be consistent with the commercial closure for gag, black grouper, and red grouper. Landings or bycatch of non-grouper reef fishes, such as vermilion snapper, could be negatively affected by a closure if anglers target these species during the grouper closure. No additional impacts to red snapper are expected since the recreational red snapper fishery is closed during this time period.

Preferred Alternative 5 is expected to reduce landings of red grouper by approximately 90,000 to 99,000 more fish than **Alternative 1**, valued at \$366,000 to \$404,000. As mentioned above, there will be forgone expenditures resulting from cancelled trips, which for **Preferred Alternative 5** would be as high as \$40 million; much less than either of the other closure alternatives. The economic analyses for **Preferred Alternative 5** overestimate the reduction in fish as well as consumer surplus and foregone expenditures because the model had to be applied to two full months instead of the proposed February 15 to March 15 period (see Section 7.3.2.5). Based on foregone expenditures, the overall economic impact is far greater than for any of the alternatives that do not use season closures.

Alternative 6 would reduce the red grouper daily bag limit to one fish per person and increase the minimum size to 21-inches TL. This alternative is expected to reduce red grouper landings by 40 percent. Increasing the minimum size limit would contribute to more red grouper being released and dying when compared to status quo (no action). However, the daily bag limit should not affect bycatch as much because it is expected that targeted red grouper fishing may cease upon reaching the daily bag limit. As with **Alternative 3**, the increase in the minimum size limit could result in foregone yield because there would be increased mortality from natural causes before fish reach legal size.

Alternative 6 is projected to result in a reduction in red grouper landings of approximately 38,000 to 93,000 more fish than **Alternative 1**, valued at \$138,000 to \$366,000 in consumer surplus. The economic effect of **Alternative 6** is similar to **Alternative 3** and both indicate slightly more economic loss than **Alternatives 2** and **7**, which only use bag and vessel limits. The mortality associated with the release of undersized fish will likely reduce the benefits of the reduced landings, thereby slowing progress toward returning to the rebuilding path and not avoiding more restrictive management and accompanying adverse economic impacts. Similar concern is not as great under bag and seasonal adjustments since there is a greater expectation

targeted fishing will cease upon reaching the daily bag limit, and directed fishing will be reduced under seasonal closures, thereby reducing catch and release activity. Conversely, increased minimum size limits directly affect the ability to reach the daily bag limit, inducing increased catch and release behavior.

Alternative 7 would maintain the 20-inch TL minimum size limit, reduce the red grouper daily bag limit from two to one red grouper per angler in the entire recreational fishery and implement a three fish daily vessel limit for private vessels and for charter vessels with carrying capacities of six or fewer passengers. Charter vessels and headboats permitted to carry more than six passengers (i.e. they have a Coast Guard Certificate of Inspection) would be limited to one red grouper for each two paying passengers. This alternative is expected to reduce red grouper landings by 37 percent (Strelcheck 2005d). The intent of this alternative, as compared to **Alternative 2**, is to reduce the effect of the three-fish vessel limit on those for-hire vessels that carry large numbers of passengers because lower vessel limits have a disproportionate effect on these vessels (See Table 3.4, headboat versus private).

This measure could result in increased fishing pressure and fishing mortality on other grouper if hook-and-line anglers and spear fishermen attempt to replace the red grouper they were previously allowed to keep with another grouper. Assuming that anglers stop fishing for red grouper once they have caught their one fish, bycatch would be expected to decrease; however, if anglers continue fishing for red grouper in an attempt to catch a larger red grouper (high grade), bycatch may not decrease. Because red grouper co-occur with other grouper species, this alternative may also increase red grouper bycatch if anglers continue fishing for other grouper once reaching their red grouper bag or vessel limit.

Alternative 7 is expected to reduce recreational red grouper landings by approximately 24,000 to 94,000 fish, valued at \$100,000 to \$388,000 in consumer surplus. The short-term adverse economic impacts of **Alternative 7** would be similar to **Alternative 2** and less than any of the other alternatives. The reduction in landings should reduce the jeopardy to the red grouper rebuilding plan.

3.2 Action 2: For-Hire Captain and Crew Daily Bag Limit

Alternative 1. Status quo/no action. The captain and crew of a for-hire vessel may retain the same number of fish allowed for each passenger.

Preferred Alternative 2. The captain and crew of a for-hire vessel may not retain any grouper when under charter

Discussion: Reductions in landings resulting from restrictions on captain and crew retention limits are difficult to quantify because surveys used to collect recreational fishing data do not provide information on the number of captains or crew on the vessel, or whether or not the captain and crew contributed to the catch. Also, because few anglers on average report landing greater than the aggregate grouper daily bag limit or greater than the red grouper daily bag limit,

there currently appears to be little incentive for captain and crew to retain additional fish for themselves or clients (see Tables 1 and 4 in Strelcheck 2005b). However, implementation of more restrictive daily bag limits (as proposed in Sections 3.2.1 and 3.2.3) could affect the behavior of captain and crew.

Alternative 1 would continue to allow captain and crew to retain recreational daily bag limits for grouper while under charter. If the Council chooses not to reduce the daily bag limit for red grouper or the aggregate grouper daily bag limit, then this alternative would likely have little or no effect on reducing grouper landings. However, if the Council reduces the red grouper or aggregate grouper daily bag limit, captain and crew could and potentially would supplement the catch of their clients and negate some of the reductions expected from the lower daily bag limits. The intended effect of **Preferred Alternative 2** would be to prevent charter captain and crew from supplementing their client's landings once their client's daily bag limits have been met. **Preferred Alternative 2** would not be expected to prevent crew from supplementing client's landings within the existing daily bag limit. Any reductions in landings resulting from the alternative are expected to be small for the reasons stated above and because the for-hire sector represents only about 23 percent of the annual grouper landings.

3.3 Action 3: Aggregate Grouper Daily Bag Limit

Background: The intent of Action 3 is to slow or prevent a shift in effort from red grouper to other grouper as a result of any actions to reduce the landings of red grouper. The recreational grouper fishery lands primarily two species of SWG; gag represents about 63 percent of the landings while red grouper represents 34 percent of the landings. Black grouper, other SWG and DWG represent a small amount of landings at 0.8, 2.3 and 0.4 percent respectively of the annual recreational grouper landings. Black grouper and gag co-occur in southwest to west-central Florida and gag is often misidentified or misreported as black grouper making it very difficult to manage the two species differently. Other SWG and DWG represent a small portion of total grouper landings, but may be significantly affected by a shift in effort. A shift in recreational effort towards gag would likely be significant since the recreational fishery typically lands about 59 percent of total gag landings (commercial + recreational). Based on the last assessment (Turner, et al. 2001), the gag resource is not overfished or undergoing overfishing but is considered fully utilized. The RFSAP in 2001 recommended that the ABC for gag be 5.2 million pounds starting in 2000. However, the actual total landings since 2000 have been above the recommended ABC by approximately 20-30 percent. Any increase in the landings of gag would exacerbate the current situation and potentially require additional regulations depending on results of next stock assessment in 2006.

Preferred Alternative 1. Status quo/no action. The grouper aggregate daily bag limit will be 5 fish.

Alternative 2. The grouper aggregate daily bag limit will be 4 fish. Reduces grouper landings other than red grouper by 3 percent.

Alternative 3. The grouper aggregate daily bag limit will be 3 fish. Reduces grouper

landings other than red grouper by 7 percent.

Alternative 4. The grouper aggregate daily bag limit will be 2 fish. Reduces grouper landings other than red grouper by 19 percent.

Discussion: **Preferred Alternative 1** would maintain the aggregate daily bag limit of five grouper per angler. The aggregate daily bag limit has been in effect since 1990 when Amendment 1 to the Reef Fish FMP was implemented. This alternative is not expected to reduce grouper landings or change the economic conditions of the recreational grouper fishery. If any action is taken to reduce the red grouper daily bag limit or size limit, or implement a vessel limit, it is likely that some fishing effort would shift toward other grouper targeted by recreational anglers. Of the species within the reef fish management unit, gag would be the most impacted by any shift in effort, representing about 63 percent of recreational grouper landings. Based on the most recent stock assessment, gag are not overfished nor undergoing overfishing but are fully utilized; and, in the years since the assessment, landings have exceeded the ABC recommended by the RFSAP. The Council expects that Preferred Alternative 5 in Action 1 (closing February 15 to March 15 for gag and black grouper as well as red grouper which reduces harvest of gag and black groupers by seven percent) will be sufficient to compensate for any increase in annual harvest of gag or black grouper during the remaining open season and for any increase in red grouper discards due to the one red grouper bag limit.

Alternatives 2-4 would reduce the aggregate grouper daily bag limit from 5 to 4, 3, or 2 grouper per angler, respectively. It is assumed that any change in the aggregate daily bag limit will not affect the landing of red grouper, only other grouper, because the proposed daily bag limit of red grouper within the aggregate is equal to or lower than any of the proposed aggregate daily bag limits. **Alternative 2** would reduce the landings of grouper, excluding red grouper, by 3 percent in 2006 and cause a loss in consumer surplus of \$59,000 to \$145,000 more than **Alternative 1**. **Alternative 3** would reduce the landings of grouper, excluding red grouper, by 7 percent in 2006 and cause a loss in consumer surplus of \$166,000 to \$374,000 more than **Alternative 1**. **Alternative 4** is the most restrictive aggregate daily bag limit and would reduce the landings of grouper, excluding red grouper, by 19 percent in 2006 and cause a loss in consumer surplus of \$426,000 to \$766,000.

Reducing the aggregate daily bag limit is expected to provide protection to other grouper species from redirected red grouper effort. Reducing the aggregate daily bag limit would also reduce bycatch and subsequent mortality of red grouper, assuming anglers cease fishing upon reaching the aggregate daily bag limit. Lower aggregate grouper bag limits would reduce the impacts from hook-and-line fishermen and spear fishermen redirecting effort to other species because of red grouper management measures. Lower aggregate grouper bag limits would also reduce bycatch from hook-and-line fishermen. Incentives to take or continue a trip would likely be made based on the aggregate daily bag limit and the general availability of all species in the aggregate rather than a single species within that aggregate. Recreational fishing gear and baits used for gag and red grouper are very similar, so shifting target species within the aggregate grouper complex should not alter total recreational discards, but would alter the species composition of discards.

The potential protection is greatest for **Alternative 4**, followed by **Alternatives 3, 2, and 1**. The greater the reduction, the more anglers are limited in their ability to substitute other grouper species for reductions in red grouper landings. However, at some point, the protection of these other species may be greater than is necessary to sustain those stocks over the long-term, given natural availability and the ability or tendency to catch these species. Thus, foregone socioeconomic benefits may be incurred. Since the Council has selected a closed season of February 15 to March 15 for gag, black grouper, and red grouper that is expected to reduce harvest of gag and black grouper by approximately seven percent (Action 1; Preferred Alternative 5), the aggregate grouper daily bag limit in this action is believed to be adequate and no further compensation for redirected effort and regulatory discards caused by the one red grouper bag limit is necessary.

4 REGULATORY IMPACT REVIEW

4.1 Introduction

The NMFS requires a 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 regulatory action; (2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives which 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 any proposed regulations are a "significant regulatory action" under certain criteria provided in Executive Order 12866 (E.O. 12866) and whether the approved regulations will have a "significant economic impact on a substantial number of small business entities" in compliance with the Regulatory Flexibility Act of 1980 (RFA).

4.2 Problems and Objectives

The purpose and need, issues, problems, and objectives of the proposed amendment are presented in Section 2.0 and are incorporated herein by reference. In summary, the purpose for this regulatory amendment is to implement management measures for the Gulf of Mexico grouper fishery which will restrict recreational red grouper landings to levels specified in the red grouper-rebuilding plan and prevent or minimize impacts on gag and other grouper resulting from more restrictive recreational red grouper regulations.

4.3 Methodology and Framework for Analysis

This RIR assesses management measures from the standpoint of determining the resulting changes in costs and benefits to society. To the extent practicable, the net effects of the proposed measures should be stated in terms of producer and consumer surplus, changes in profits, employment in the direct and support industries, and participation by charter boat fishermen and private anglers. However, this information generally does not exist for the fisheries covered by the proposed action. Therefore, the impacts of the proposed action are described in terms of estimated changes in consumer surplus, the number of affected trips, and potential foregone expenditures associated with recreational fishing activity. In addition, the public and private costs associated with the process of developing and enforcing regulations on fishing for reef fish in waters of the U.S. Gulf of Mexico are provided.

4.4 Description of Fisheries

The recreational Gulf grouper fishery is described in Section 6, and is incorporated herein by reference.

4.5 Impacts of Management Measures

This proposed amendment contains three actions to control the recreational landings of grouper. Additional details on the economic impacts of the proposed management alternatives are included in Section 7.3 and are included herein by reference.

4.5.1 Action 1: Red Grouper Landings Limits

Alternative 1 (status quo/no action) is expected to result in a reduction of red grouper landings of approximately 38,000-70,000 fish, valued at \$140,000-\$276,000 in consumers surplus (Table 7.3.1), assuming strict adherence to the red grouper daily bag limit occurs. Continued fishing under status quo regulations is expected to result in red grouper landings exceeding the recreational target catch level, 1.25 MP GW. Continued overages have the potential to jeopardize the recovery of red grouper, requiring deviation from the rebuilding plan, more restrictive management measures, and delay in greater landings allowances that would be possible as the stock is rebuilt. More restrictive management would be expected to result in reduced landings, reduced value per trip, and potentially reduced numbers of trips. A reduction in trips would result in a reduction in associated expenditures through the fishery and associated industries. This would reduce the overall current and future economic value of the fishery. Changes in fishing patterns may increase pressure on other stocks and lead to additional adverse economic consequences should landings of these stocks exceed allowable limits. These indirect impacts cannot be forecast at this time.

Alternative 2 is expected to reduce recreational red grouper landings by approximately 61,000-158,000 fish, valued at \$234,000-\$639,000 in consumer surplus (Table 7.3.1, or approximately \$41,000-\$272,000 less than **Preferred Alternative 5** (Table 7.3.7). The additional protection to related species (black grouper and gag) afforded by **Preferred Alternative 5** is expected to result in unquantifiable benefits to both red grouper, through the reduction of bycatch mortality, and black and gag grouper.

Alternative 3 is expected to reduce landings by approximately 79,000-170,000 fish, valued at \$278,000-\$661,000 in consumer surplus (Table 7.3.1), or approximately \$19,000-\$228,000 less than the **Preferred Alternative 5** (Table 7.3.7). Similar to comparison with **Alternative 2**, however, the additional protection to related species afforded by **Preferred Alternative 5** is expected to result in unquantifiable benefits to both red grouper, through the reduction of bycatch mortality, and black and gag grouper.

Alternative 4A is expected to reduce landings by approximately 103,000-302,000 fish, valued at \$398,000-\$1.22 million in consumer surplus (Table 7.3.1), or approximately \$108,000 less to \$542,000 more than the **Preferred Alternative 5** (Table 7.3.7), depending upon fishing conditions. Although all affected trips are not expected to be cancelled, since fishing for alternative species would still be possible, if all affected anglers cancel their fishing trips during the proposed closed period for this alternative, foregone expenditures associated with those trips would range from \$97.11 million to \$105.40 million (Table 7.3.19), or an average of \$101.25

million in potential foregone expenditures. This is over twice the expected potential foregone expenditures projected to accrue to **Preferred Alternative 5**.

Alternative 4B is expected to reduce landings by approximately 201,000-351,000 fish, valued at \$746,000-\$1.39 million in consumer surplus (17.3.6), or approximately \$239,000-\$708,000 more than the **Preferred Alternative 5** (Table 7.3.7). If all affected anglers cancel their fishing trips during the proposed closed period for this alternative, foregone expenditures associated with these trips would range from \$172.11 million to \$211.53 million (Table 7.3.19), or an average of \$191.82 million in potential foregone expenditures. This is almost five times the expected potential foregone expenditures projected to accrue to **Preferred Alternative 5**.

Preferred Alternative 5 is expected to reduce landings by approximately 128,000-168,000 fish, valued at \$506,000-\$680,000 in consumer surplus (Table 7.3.1). If all affected anglers cancel their fishing trips during the proposed closed period for this alternative, foregone expenditures associated with these trips would range from \$38.33 million to \$42.47 million (Table 7.3.19), or an average of \$40.30 million in potential foregone expenditures.

Among those alternatives that contain a closure provision, under which the likelihood of trip cancellation and reduction of expenditures to the associated industries is the greatest, the expected impacts of **Preferred Alternative 5** are the smallest. The potential reduction in charterboat fees is estimated to average \$2.52 million for **Preferred Alternative 5**, whereas the values range from \$8.01 million to \$19.66 million for **Alternatives 4A** and **4B**, respectively.

Alternative 6 is expected to reduce landings by approximately 77,000-163,000 fish, valued at \$278,000-\$642,000 in consumer surplus (Table 7.3.1), or approximately \$38,000-\$229,000 less than **Preferred Alternative 5** (Table 7.3.7). Similar to comparison with **Alternatives 2** and **3**, however, the additional protection to related species afforded by **Preferred Alternative 5** is expected to result in unquantifiable benefits to both red grouper, through the reduction of bycatch mortality, and the other grouper species.

Alternative 7 is expected to reduce landings by approximately 63,000-164,000 fish, valued at \$240,000-\$664,000 in consumer surplus (Table 7.3.1), or approximately \$17,000-\$266,000 less than the **Preferred Alternative 5** (Table 7.3.7). Similar to comparison with **Alternatives 2, 3, and 6**, however, the additional protection to related species afforded by **Preferred Alternative 5** is expected to result in unquantifiable benefits to both red grouper, through the reduction of bycatch mortality, and the other grouper species.

4.5.2 Action 2: For-hire Captain and Crew Daily Bag Limit

No direct economic impacts are expected to accrue to **Alternative 1 (status quo/no action)** since all current and customary behaviors would be unaffected.

Preferred Alternative 2 is not expected to have any direct impacts on for-hire business operations since captain and crew limits are not expected to be a factor in the determination of service fees, nor are they expected to be included in the demand function for these services.

However, to the extent that these landings represent an inexpensive food source for captain and crew, since the cost of their harvest is largely subsidized by the paying customer, their replacement by other, potentially costlier substitute foods may have unknown and unquantifiable impacts.

4.5.3 Action 3: Aggregate Grouper Daily Bag Limit

Preferred Alternative 1 (status quo/no action) is not expected to have any direct economic impacts since all current and customary behaviors would be unaffected. Additional mortality of red grouper due to bycatch while targeting other grouper could reduce the effectiveness of the red grouper landing reduction measures, thereby jeopardizing the rebuilding plan, inducing delayed recovery, more severe restrictions, and accompanying increased adverse economic impacts. Overfishing of other species could also occur if effort is redirected because of more restrictive red grouper management actions. However, the Council expects **Preferred Alternative 5 in Action 1** (closing February 15 to March 15 to gag and black grouper as well as red grouper and reducing harvest of gag and black groupers by seven percent) will be sufficient to compensate for any increase in harvest of gag or black grouper during the remaining open season and for any increase in red grouper discards due to the one red grouper bag limit.

Alternative 2 is expected to reduce landings by approximately 53,000-105,000 fish, valued at \$199,000-\$420,000 in consumer surplus (Table 7.3.10), or approximately \$107,000-\$230,000 less than the **Alternative 3** (Table 7.3.16). The reduction in the aggregate daily bag limit is expected to provide additional protection to other grouper species from redirected red grouper effort, as well as reduce bycatch and subsequent mortality of red grouper, assuming anglers cease fishing upon reaching the limit. The economic impacts of this cannot be assessed since it cannot be forecast how much redirection might otherwise occur and what impact this may have on these species. The reduction in the aggregate daily bag limit should not eliminate the mitigation benefits of all substitution, but could prevent excessive new pressure on substitute species. Avoidance of excessive pressure on these alternative species and the additional management measures that might otherwise be required would eliminate any reduction of benefits that would accrue to these fisheries. The more restrictive limit of **Alternative 3** and **4** are expected to result in increased stock benefits (i.e., healthier, more abundant fish stocks), which would translate into unquantifiable economic benefits, over **Alternative 2**.

Alternative 3 is expected to reduce landings by approximately 78,000-161,000 fish, valued at \$306,000-\$650,000 in consumer surplus (Table 7.3.10). The reduction in the aggregate daily bag limit under **Alternative 3** is expected, however, to provide protection to other grouper species from redirected red grouper effort, as well as reduce bycatch and subsequent mortality of red grouper, producing unquantifiable economic benefits.

Alternative 4 is expected to reduce landings by approximately 141,000-256,000 fish, valued at \$566,000-\$1.04 million in consumer surplus (Table 7.3.10), or approximately \$260,000-\$391,000 more than the **Alternative 3** (Table 7.3.16). Similar to **Alternatives 2** and **3**, the reduction in the aggregate daily bag limit in addition to the reduction in the red grouper daily bag limit may provide some protection to other grouper species from redirected red grouper effort, as

well as reduced bycatch and subsequent mortality of red grouper, assuming anglers cease fishing upon reaching the limit. Since the reduction in the aggregate limit is greater for this alternative, the potential protection is greater. However, the greater the reduction, the more anglers are limited in substituting species and mitigating the impacts of the reduced red grouper daily bag limit. At some point the protection of these other species may be more than is necessary and the potential for foregone benefits exists; however, that point cannot be quantitatively identified. The Council felt that the reductions specified by **Alternative 2-4** are significant, excessive, and would likely result in substantial foregone economic benefits when combined with the reductions from Action 1; Preferred Alternative 5.

4.6 Public and Private Costs of Regulations

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

Council costs of document preparation, meetings, public hearings, and information dissemination	\$100,000
NOAA Fisheries administrative costs of document preparation, meetings and review	\$100,000
Annual law enforcement costs	0
TOTAL	\$200,000

Regardless of the alternatives selected, recreational fisheries will continue to operate. Law enforcement currently monitors regulatory compliance in these fisheries under routine operations and does not allocate specific budgetary outlays to these fisheries, nor would the proposed actions require modification or increases in current enforcement practices. Thus, no law enforcement costs are attributable to the proposed action.

4.7 Summary of Economic Impacts

The proposed action is expected to reduce short-term consumer surplus in the recreational fishery by \$506,000-\$680,000 due to expected reductions in grouper landings (Preferred Alternative 5, Action 1). If all affected anglers cancel their fishing trips during the proposed closed period (Preferred Alternative 5, Action 1), foregone expenditures associated with these trips would range from \$38.33 million to \$42.47 million, or an average of \$40.30 million. Included in this estimate are charterboat fees estimated to average \$2.52 million. The prohibition of captain and crew limits may have unknown and unquantifiable impacts on the personal food budgets of these individuals. The estimated losses are assumed to be upper bounds since not all affected trips would be cancelled, opportunities to fish for other species will remain, and many fishing trips are just one part of multi-day vacations. Further, these losses are expected to be less

than if continued landing overages are allowed to occur in the recreational sector, resulting in jeopardy to the recovery plan and the precipitation of more severe landing restrictions in the future.

4.8 Determination of Significant Regulatory Action

Pursuant to Executive Order (E.O.) 12866, a regulation is considered a "significant regulatory action" if it: (1) 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 or communities; (2) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency; (3) materially alters the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

Preferred Alternative 5 in Action 1 is expected to reduce short-term consumer surplus in the recreational fishery by \$506,000-\$680,000 due to expected reductions in grouper landings. If all affected anglers cancel their fishing trips during the proposed closed period, foregone expenditures associated with these trips are estimated at approximately \$40.30 million. This, however, is considered an upper bound since not all trips would likely be cancelled. Additionally, the prohibition of captain and crew limits (Preferred Alternative 2, Action 2) may have unknown and unquantifiable impacts on the personal food budgets of these individuals. All losses, however, are expected to be less than if continued landing overages in the recreational sector are allowed to occur. The unquantifiable long-term net gain to the fishery, therefore, is expected to be positive.

The preferred alternatives in Actions 1 and 2 will clearly not meet the \$100 million threshold, nor are there expected to be any significant adverse effects on prices, employment, or competition. Preferred measures in Actions 1 and 2 are not expected to adversely affect the environment, public health or safety, or state, local, or tribal governments or communities, nor do they interfere or create inconsistency with any action of another agency, including state fishing agencies. No effects on the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof have been identified. The preferred alternatives selected by the Council represent normal management options or practices and, therefore, do not raise novel legal or policy issues.

Since the proposed regulatory action will not meet any of the conditions listed above, it is determined that the proposed rule, if implemented, would not constitute a "significant regulatory action" under E.O. 12866.

5 REGULATORY FLEXIBILITY ACT ANALYSIS

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

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. In addition to analyses conducted for the RIR, the regulatory flexibility analysis provides: (1) a statement 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; (5) an identification, to the extent practical, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; and (6) a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

In addition to the information provided in this section, additional information on the expected economic impacts of the proposed action are included in Sections 4 and 7 and is included herein by reference.

Statement of need for, objectives of, and legal basis for the rule: The purpose and need, issues, problems, and objectives of the proposed rule are presented in Section 2 and are incorporated herein by reference. In summary, the purpose for this regulatory amendment is to implement management measures for the Gulf of Mexico grouper fishery which will restrict recreational red grouper landings to levels specified in the red grouper-rebuilding plan and prevent or minimize impacts on gag and other grouper resulting from more restrictive recreational red grouper regulations. The Magnuson-Stevens Fishery Conservation and Management Act provides the statutory basis for the proposed rule.

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.

Description and estimate of the number of small entities to which the proposed rule will apply: While permits for for-hire fishing for Gulf reef fish have been required since 1996, the number of vessels that can engage in this fishery has been limited under a permit moratorium implemented in 2003. Currently, approximately 1,625 unique vessels are permitted to operate in the Gulf for-hire fishery (GMFMC 2005). The average charter vessel is estimated to generate \$76,960 in annual revenue and \$36,758 in annual “profit” (computed as gross revenue – costs; costs exclude depreciation, other fixed costs, and returns to owner/operators; see Section 6.3.2.3). The comparable figures for an average headboat are \$404,172 in annual gross revenue and \$338,209 in annual profits. Some vessels in the for-hire fleet also participate in the commercial grouper fishery. Information on the average revenues generated from operation as a commercial vessel, and the impacts of these revenues on the overall economic performance of the operations is unknown.

Although the proposed actions would not directly affect support industries, potential reductions in fishing effort and associated expenditures may have indirect impacts on retailers, hotels, restaurants, gear and bait shops, and other associated businesses. It is not possible to enumerate or characterize these businesses.

Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records: The proposed rule would not change current reporting, record-keeping and other compliance requirements under the FMP. These requirements include qualification criteria for for-hire vessel permits and participation in additional data collection programs if selected by NMFS. All of the information elements required for these processes are standard elements essential to the successful operation of a fishing business and should, therefore, already be collected and maintained as standard operating practice by the business. The requirements do not require professional skills, and, therefore, are deemed not to be onerous.

Substantial Number of Small Entities Criterion: The Small Business Administration defines a small business in the for-hire fishery sector as a firm that is independently owned and operated, is not dominant in its field of operation, and has annual receipts up to \$6.0 million.

Given the economic profile of the for-hire fleet presented above, it is determined that all for-hire fishing entities that will be affected by the proposed action are small business entities. Since all said entities would be potentially affected, it is determined that the proposed action will affect a substantial number of small entities.

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

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

All for-hire entities affected by the proposed rule are considered small entities so the issue of

disproportionality does not arise in the present case.

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

For-hire operations will bear the primary burden of the proposed regulatory measures (Alternative 5, Action 1 and Alternative 2, Action 2), though spill-over impacts would be expected in associated industries, such as marinas, and bait and tackle shops. For-hire operations may experience a reduction in bookings, resulting in lost fees and tips, gear rental receipts, and fish-cleaning fees. The proposed rule is projected to result in a reduction of for-hire fees of up to \$2.52 million. Although the incidence of cancellation is not expected to be uniform across the Gulf, since the importance of grouper varies by geographic location and business operation, this equates to approximately \$1,400 per vessel, or approximately 2 percent of average gross revenues and 4 percent of net revenues. The potential impact of the proposed actions on associated industries cannot be determined.

Description of Significant Alternatives: In Action 1, six alternatives, including no action (status quo), were considered in addition to the preferred alternative to reduce recreational red grouper landings. No action (Alternative 1, Action 1) would have allowed continued landing overages in the recreational sector and would, therefore, not meet the Council's objectives.

A second alternative (Alternative 2, Action 1) would have reduced the red grouper daily bag limit to one fish or three fish per vessel. This alternative contained no protection for associated grouper species and increased the possibility of both excessive redirected effort to these other species and increased red grouper bycatch mortality. This alternative did not, therefore, meet the Council's objectives.

Another alternative (Alternative 3, Action 1) would have increased the red grouper recreational minimum size limit to 22 inches. Although this would have resulted in lower short-term adverse economic impacts relative to the status quo (no action), the potential increase in bycatch and discard mortality was determined to be unacceptable.

One alternative (Alternative 4a, Action 1) would reduce the red grouper recreational bag limit within the aggregate limit to one per person per day and close the season for all grouper during August. On average, this alternative would have resulted in greater reductions in consumer surplus and potential foregone expenditures than the proposed action.

Another alternative (Alternative 4b, Action 1) would reduce the red grouper recreational bag limit within the aggregate limit to one per person per day and close the season for all grouper during April through May. This alternative would also have resulted in greater reductions in consumer surplus and potential foregone expenditures than the proposed action.

The sixth alternative (Alternative 6, Action 1) would have reduced the red grouper bag limit within the aggregate limit to one per person per day and increased the minimum recreational size limit to 21 inches. Similar to the proposal to increase the minimum size limit to 22 inches,

excessive bycatch mortality was expected to accrue from this action.

The final alternative (Alternative 7, Action 1) to the proposed red grouper bag limit and seasonal closure would reduce the red grouper bag limit within the aggregate limit to one per person or three per vessel per day, whichever is less, except for Reef Fish permitted for-hire vessels with Coast Guard COI permits. For these vessels, the resultant vessel limit would be one red grouper per two paying passengers. While this alternative is projected to result in reduced short-term reductions in consumer surplus relative to the proposed action, this alternative, similar to the second and third alternatives, contains no protection for associated species and, therefore, does not address the Council's concern for redirection of effort and increased bycatch.

In Action 2, one alternative, the status quo (no action), was considered in addition to the proposed 0-fish captain and crew limit. The status quo/no action alternative (Alternative 1, Action 2), however, in combination with the other proposed actions, would not achieve the necessary red grouper harvest reductions and would not, therefore, meet the Council's objectives.

In Action 3, three alternatives were considered for the aggregate grouper daily bag limit, in addition to the preferred alternative, status quo/no action (Alternative 1, Action 3). Status quo (no action) would not impose additional restrictions on the harvest of other grouper species and would not, therefore, result in any direct adverse economic impacts on small entities. The Council has determined that the one month closure for red, gag, and black grouper (Action 1; Preferred Alternative 5) is sufficient to provide the necessary protection for other grouper to compensate for potential redirection of effort due to the proposed red grouper restrictions.

Three alternatives would reduce the aggregate grouper daily bag limit to 4, 3 or 2 fish (Alternatives 2-4, Action 3). Any of these reductions were believed to be excessive and would increase the adverse economic impacts relative to the proposed action given that Action 1; Preferred Alternative 5 is expected to provide sufficient protection.

6 AFFECTED ENVIRONMENT

Section 1502.15 of the CEQ regulations states “environmental impact statements shall succinctly describe the area(s) to be affected or created by the alternatives under consideration.” A brief description of the affected environment is included herein. More detailed descriptions of the affected environment can be found in the EIS to the Generic EFH Amendment (GMFMC 2004a) and Secretarial Amendment 1 to the Reef Fish FMP (NMFS 2004a), and are incorporated herein by reference. Tables cited in this section are in Section 12.

6.1 Physical Environment

The grouper fishery occurs throughout the Gulf of Mexico, but is primarily concentrated on the West Florida Shelf. Most recreational landings of red grouper and other SWG occur off of Florida over hard-bottom habitat. In the western GOM, DWG are harvested over rocky ridges or flat bottom, near banks or ‘lumps’ (Cass-Calay and Bahnick 2002). Deep-water grouper also occur near the shelf-edge over sand, mud, and shell bottom (Cass-Calay and Bahnick 2002).

The GOM is bounded by Cuba, Mexico, and the United States, and has a total area of 564,000 km². Continental shelves occupy about 35 percent of the total GOM. The west Florida shelf provides a large area of hard bottom habitat. It is comprised of low relief hard bottoms that are relict reefs or erosional structures. Some high relief can be found along the shelf edge in waters 130 to 300 m deep. Hard bottom provides extensive areas where reef biota such as corals can become established. These hard bottom areas have become important reef fish fishing areas (e.g. Florida Middle Grounds, Tortugas).

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

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

6.2 Biological Environment

Shallow-water and deep-water grouper comprise a multispecies fishery in the Gulf of Mexico. The Reef Fish FMP includes 42 species of reef fish comprising six families: Balistidae (triggerfishes), Carangidae (jacks), Labridae (wrasses), Lutjanidae (snappers), Malacanthidae (tilefishes), and Serranidae (grouper). Seventeen grouper species are included in the Reef Fish FMP, of which 13 are managed, two are prohibited from harvest (Nassau and goliath grouper),

and two species are not in the management unit (sand perch and dwarf sand perch). Shallow-water grouper in the management unit include: red grouper, black grouper, gag, yellowfin grouper, scamp, yellowmouth grouper, rock hind, and red hind. Deep-water grouper in the management unit include: yellowedge grouper, warsaw grouper, snowy grouper, speckled hind, and misty grouper. Red grouper, gag, and black grouper are the most commonly landed SWG species in both the commercial and recreational sectors. Approximately 98 percent of DWG landings are by commercial fishermen. Yellowedge grouper is the most commonly landed DWG species.

6.2.1 Biology and Life History

Secretarial Amendment 1 (NMFS 2004a) and Amendment 24 to the Reef Fish FMP provide (GMFMC 2004d) detailed descriptions of the biology and life history of reef fish, and are incorporated herein by reference.

6.2.1.1 Red Grouper

In the GOM, red grouper are commonly caught from Panama City, Florida, to the Florida Keys along the inner to mid-continental shelf in depths ranging from 2 to over 120 m (Moe 1969). Based on reported commercial landings, the SEFSC's Headboat Survey, and MRFSS, red grouper are infrequently caught in the western Gulf. The species inhabits flat rock perforated with solution holes, caverns and crevices of limestone reef, and hard bottom areas (Moe 1969; Bullock and Smith 1991). Juveniles live in shallow-water, nearshore reefs until reaching approximately 16 inches (40 cm), when they become sexually mature and move offshore (Moe 1969). Red grouper reach a maximum length and weight of 43 inches (110 cm TL) and 50.7 lbs. (23 kg) (Robins et al. 1986). Maximum age is 28 years and females are 50 percent mature by 5 years of age and 15-20 inches TL (40-50 cm TL) (Moe 1969; Collins et al. 2002). Red grouper are protogynous hermaphrodites, transitioning from females to males at older ages, and form harems for spawning (Dormeier and Colin 1997). Age and size at sexual transition is approximately 13 years and 31-35 inches TL (80-90 cm TL) (Collins et al. 2002). Peak spawning occurs from March through May (Collins et al. 2002). Over the last 25-30 years, there has been little change in the sex ratio of red grouper, likely because they do not aggregate (Coleman et al. 1996).

6.2.1.2 Gag

Gag are primarily caught on the west coast of Florida from Tampa Bay to the northern extent of the state (Goodyear and Schirripa 1994). Newly settled juveniles are estuarine dependent, occurring in shallow seagrass beds during late spring and summer (Koenig and Coleman 1998; Strelcheck et al. 2003). At the onset of the first winter, juvenile gag migrate offshore, although some juvenile gag may remain in inshore waters during winter (Heinisch and Fable 1999). As gag mature, they move to deeper, offshore waters to spawn. Gag are protogynous hermaphrodites, transitioning from females to males at older ages. Age and size at sexual transition is approximately 11 years and 41 inches TL (105 cm TL). Maximum age is 26 years (Harris and Collins 2000) and females are 70 percent mature by 4 years of age and 25.6 inches

TL (65 cm TL) (Hood and Schlieder 1992). They form spawning aggregations at depths ranging from 160-400 feet (Coleman et al. 1996). Peak spawning occurs from February through March (Hood and Schlieder 1992). Often immature female gag are found with spawning aggregations (Coleman et al. 1996). Gag reach a maximum length and weight of 47 inches (121m TL) and 80 lbs (23 kg) (Harris and Collins 2000; IGFA 2003).

6.2.1.3 Other Shallow-water Grouper

Other SWG occupying similar depth distributions and geographic ranges as red grouper and gag include black grouper, scamp, red hind, rock hind, yellowfin grouper, Nassau grouper, goliath grouper, and yellowmouth grouper. These species account for a small percentage of the overall commercial and recreational SWG landings. Black grouper and scamp are the most commonly landed SWG after gag and red grouper. Yellowfin grouper, yellowmouth grouper, rock hind, and red hind are infrequently landed. The harvest of goliath and Nassau grouper is prohibited in the Gulf of Mexico.

Maximum lengths of these SWG range from 35 inches TL (89 cm, scamp) to 98 inches TL (250 cm, goliath grouper), with most reaching a maximum length of slightly greater than 39 inches (1 m) (Matheson et al. 1986; Heemstra and Randall 1993). Rock hind, Nassau grouper, and speckled hind have shorter life spans than most grouper, with maximum ages ranging from 12 to 17 years (Matheson and Huntsman 1984; Claro et al. 1990; Potts and Manooch 1995). Maximum weights for these SWG range from 13.6 lbs (yellowmouth grouper) to 680 lbs (goliath grouper) (Bullock and Murphy 1994; IGFA 2003). Black grouper are the largest SWG species allowed for harvest, with a maximum recorded length and weight of 89 inches TL (151 cm) and 180 lbs (82 kg) (Crabtree and Bullock 1998).

Most of the SWG mature between 3 and 5 years, although Nassau and goliath grouper are known to mature as late as 7-8 years of age (Bullock et al. 1992; Sadovy and Colin 1995). Many, but not all SWG are protogynous hermaphrodites and transition from females to males as they grow larger. Goliath grouper are not protogynous hermaphrodites, and the reproductive strategy for Nassau grouper is unknown. Shallow-water grouper spawn throughout the year, with peak spawning for most SWG occurring in winter and spring (December through May). Black grouper, scamp, yellowfin grouper, goliath grouper, red hind and Nassau grouper are known to form spawning aggregations (Luckhurst et al. 1992; Coleman et al. 1996; Dorneier and Colin 1997; Sadovy and Eklund 1999; Eklund et al. 2000). The formation of spawning aggregations is suspected for rock hind (Luckhurst et al. 1992).

6.2.1.4 Deep-water Grouper

Deep-water grouper include yellowedge grouper, misty grouper, speckled hind, warsaw grouper, and snowy grouper. These grouper occur farther offshore than SWG, but some can be occasionally caught while targeting SWG. Commercial fishermen account for 98-99 percent of the annual harvest of DWG. Yellowedge grouper is the most abundant and longest-lived grouper, reaching a maximum age of 85 years (Cass-Calay and Bahnick 2002). Warsaw grouper are the largest of the DWG species, reaching a maximum length and weight of 92 inches TL (233

cm TL) and 419 lbs (190 kg) (Manooch and Mason 1987). Yellowedge grouper and snowy grouper are protogynous hermaphrodites (Bullock et al. 1996; Wyanski et al. 2000). The reproductive strategy for speckled hind, warsaw grouper, and misty grouper is unknown. All DWG, except misty grouper are suspected to form spawning aggregations. Deep-water grouper appear to spawn primarily during the summer and fall.

6.2.1.5 Snappers and Jacks

Snappers, jacks, wrasses, and triggerfishes are harvested or incidentally captured by recreational grouper fishermen. Most of these reef fish species are managed with bag limits, size limits, closed seasons, and quotas. Several species have rebuilding plans (red snapper, greater amberjack, vermilion snapper) that limit or prohibit harvest. The following is a brief description of the life history of non-grouper reef fish species potentially affected by the proposed actions.

Gray snapper, also known as mangrove snapper, occur in the Gulf of Mexico from south Florida to Louisiana. Gray snapper spawn during summer and fall (Rutherford et al. 1983). Juveniles are associated with inshore seagrass beds and mangroves (Chester and Thayer 1990; Allman and Grimes 2002). Gray snapper mature by approximately age 1 to 2 and 7-8 inches in length (Manooch and Matheson 1984). Maximum length and weight of gray snapper are 35 inches TL (89 cm) and 17 lbs (7.7 kg) (Allen 1985; IGFA 2003). Maximum age of gray snapper is estimated to be 24 years (Burton 2001).

Red snapper are found from North Carolina to the Florida Keys, and into the GOM to the Yucatan off Mexico (Robins et al. 1986). Adults are found over coral reefs, rock outcroppings, and gravel bottoms, and are associated with oil rigs and other artificial structures (GMFMC 2004a). Most landings occur from Texas to the panhandle of Florida. Eggs and larvae are pelagic while juveniles are found associated with bottom features (e.g., low relief shell) or over barren bottom. Spawning occurs 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 53 years, but most caught by the directed fishery are 2- to 4-years old (Wilson and Nieland 2001). Tagging studies have shown that red snapper can migrate large distances, especially after the occurrence of hurricanes (Watterson et al. 1998; Patterson et al. 2001).

Vermilion snapper are caught throughout the GOM, and most landings occur in Florida (Schirripa, 1998). They are usually found near hard bottom areas off the west-central Florida coast, the Florida Middle Grounds, and the Texas Flower Gardens (Smith et al. 1975; Smith 1976; Nelson 1988). Initial growth of vermilion snapper is rapid, reaching an average of about 8.3 inches (210 mm TL) by age 1 (Zastrow 1984; Nelson 1988; Hood and Johnson 1999; Allman et al. 2001). Maximum age is estimated to be 21 years (Allman et al. 2001). Most fish caught in the fishery are between 4- and 6-years old (Hood and Johnson 1999; Allman et al. 2001). Most females are sexually mature by 8 inches TL (200 mm) (Hood and Johnson 1999). Spawning occurs from the late spring to early fall (Nelson 1988; Hood and Johnson 1999).

Greater amberjack are caught primarily along the west coast of Florida westward to the Mississippi River. Greater amberjack are moderately long-lived, reaching a maximum age of 15

years in the Gulf (Thompson et al. 1999). Females mature at approximately 2 to 3 years of age and 34 inches TL (Manooch 1984). Females grow larger and older than males (Burch 1979; Thompson et al. 1999). Maximum reported length and weight for greater amberjack is 78 inches FL (197 cm) and 156 lbs (70.6 kg) (Thompson et al. 1999; IGFA 2003).

6.2.1.6 Coastal Migratory Pelagics

The FMP for Coastal Migratory Pelagic (CMP) Resources of the Gulf of Mexico and South Atlantic includes seven species: king mackerel, Spanish mackerel, cobia, cero, bluefish, little tunny, and dolphin. Commercial and recreational fishermen commonly harvest both king and Spanish mackerel. Mackerels are migratory, generally moving from wintering areas off south Florida and Mexico to more northern latitudes in spring and summer. King mackerel mature at approximately age 2 to 3 and have longevities of 24 to 26 years for females and 23 years for males (Brooks and Ortiz 2004). Spanish mackerel generally mature at age 1 to 2 and have a maximum age of approximately 11 years (Powell 1975). Both spawn during the summer (Powell 1975; McEachran and Finucane 1979). A detailed description of their biology and life history can be found in Amendment 15 to FMP for CMP Resources of the Gulf of Mexico and South Atlantic (GMFMC 2004e).

6.2.1.7 Protected Species

There are 28 cetacean and one sirenian species that have confirmed occurrences in the Gulf. All of these species are protected under the MMPA. Additionally, six of these species (blue, fin, humpback, right, sei, and sperm whales) are listed as endangered species under the ESA. All five species of sea turtles found in the Gulf (Kemp's ridley, loggerhead, green, leatherback, and hawksbill) are protected under the ESA. The endangered smalltooth sawfish is the only marine fish species listed under the ESA that is known to occur in federal Gulf waters.

Sperm whales are the most abundant large cetacean in the Gulf and are found throughout the Gulf year-round, but in waters greater than 200 m (Schmidley 1981, Hansen et al. 1996, Davis et al. 2002, Mullin and Fulling 2003), beyond where the grouper fishery occurs. Other endangered whales (blue, fin, humpback, right whale, and sei whales) are either uncommon or rare in the GOM. Individuals observed have likely been inexperienced juveniles straying from the normal range of these stocks or occasional transients (Mullin et al. 1994, Würsig et al. 2000).

Smalltooth sawfish occur from the central Florida Panhandle to northern Georgia. The species is only found with any regularity in Gulf of Mexico state waters from Naples, Florida to Florida Bay, with reduced numbers occurring in areas outside this center of abundance (Simpfendorfer 2001). Small (young) animals are restricted to very shallow waters, thus do not overlap with the grouper fishery. Large animals roam over a much larger depth range, with records of fish being captured in over 230 ft (70 m) of water depth (Simpfendorfer 2001).

Loggerhead sea turtles are the most abundant species of sea turtle occurring in U.S. waters. Nearshore waters of the GOM are believed to provide important developmental habitat for juvenile loggerheads. Green sea turtles are herbivores and prefer marine seagrasses and algae in

shallow bays, lagoons and reefs (Rebel 1974). Green sea turtles nest on the Atlantic coast of Florida, although occasionally nesting has been documented in Southwest Florida. Hawksbills feed on a wide variety of sponges and the largest hawksbill nesting population occurs off of Yucutan, Mexico (NMFS 2005c). Kemp's ridley sea turtles nest in aggregations along the Mexican coast and are in the early stages of recovery after decades of declines in population abundance (NMFS 1998). The leatherback sea turtle is distributed throughout the world, including the GOM. They are predominately pelagic and feed on jellyfish. Additional information about the life history and biology of sea turtles can be found in NMFS 2005c.

6.2.2 Status of Fish Stocks

Many reef fish stock assessments and reviews can be found online at the Gulf Council's website (www.gulfcouncil.org) or on the SEFSC's website (www.sefsc.noaa.gov). Additionally, more complete descriptions of the status of some reef fish species are provided in the EIS to the Generic EFH Amendment (GMFMC 2004a) and Amendment 22 to the Reef Fish FMP (GMFMC 2004b).

Stock assessments have been completed for ten GOM reef fish species, four of which are grouper (red grouper, gag, goliath grouper, and yellowedge grouper). Red grouper is currently undergoing overfishing, but not overfished (SEFSC 2002; NMFS 2004a). Gag was recently reclassified from not overfished but approaching an overfished condition to neither overfished or undergoing overfishing (Turner et al. 2001; NMFS 2004c). Goliath grouper is overfished and the status of yellowedge grouper is unknown (NMFS 2004c). While no assessment has been conducted on Nassau grouper, landings progressively declined from 1979 to 1992 (GMFMC 1996). Amendment 14 to the Reef Fish FMP of the Gulf of Mexico prohibited the harvest of Nassau grouper and the stock is considered overfished (GMFMC 1996). The status of other grouper species that have not been assessed is unknown.

Four grouper species are on NMFS species of concern list: goliath grouper, Nassau grouper, warsaw grouper, and speckled hind. These species were added to NMFS species of concern list based on evidence that the biological status of these species had declined and that the species faced a high degree of threat. The Council currently prohibits the harvest of Nassau and goliath grouper.

Stock assessments for six other reef fish species (vermilion snapper, red snapper, yellowtail snapper, greater amberjack, gray triggerfish, and hogfish) have been completed. Red snapper and vermilion snapper are overfished and undergoing overfishing. Revised rebuilding plans for red snapper and vermilion snapper were recently implemented (GMFMC 2004b; GMFMC 2004c). Greater amberjack is considered overfished. A rebuilding plan for greater amberjack was implemented in Secretarial Amendment 2 to the Reef Fish FMP (NMFS 2004b). An assessment of yellowtail snapper indicated the stock was not overfished or undergoing overfishing. Stock assessments were not able to resolve the status of the gray triggerfish and hogfish stocks; therefore, the status of these stocks is unknown. The status of other reef fish stocks that have not been assessed is unknown.

Stock assessments for Spanish and king mackerel have been conducted. King mackerel are not considered overfished or undergoing overfishing (SEDAR 5 Gulf of Mexico King Mackerel Advisory Report). Spanish mackerel are also not considered to be overfished or undergoing overfishing (MSAP 2003). The status of other coastal migratory pelagic (CMP) species is either unknown or considered preliminary (Prager 2000; Williams 2001; Brooks 2002; Heinemann 2002; Turner and Brooks 2002).

6.2.3 Interactions with Protected Resources

The MMPA requires commercial fisheries to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals in each fishery. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. The GOM commercial reef fish fishery is listed in Category III, as there have been no documented interactions between this fishery and marine mammals (69 FR 231). Because similar gears (hook-and-line, spears) are used in the recreational fishery, there is likely no known risk of serious injury or mortality to marine mammals resulting from the recreational fishery.

Whales are not known to be adversely affected by the reef fish fishery because they are extremely unlikely to overlap geographically. Recreational anglers infrequently take sea turtles. However, Loggerhead, leatherback, Kemp's ridley and green sea turtles are known to bite baited hooks, and loggerheads and Kemp's ridleys frequently ingest these hooks (NMFS 2005c). During 2001-2003, it was estimated that recreational anglers spent 35.7 million hook-hours fishing for reef fish, during which an estimated 111 hard-shell sea turtles were caught; 40 of which died (NMFS 2005c).

The decline in smalltooth sawfish abundance is attributed to bycatch in various commercial fisheries, compounded by habitat degradation. Juveniles primarily occur in shallow water and do not overlap with the grouper fishery. Larger sawfish occur at depths up to 230 feet and may be vulnerable to capture when bottom fishing for reef fish, but there is no supporting data. During 2001-03, it was estimated that eight smalltooth sawfish were caught and released by the commercial and recreational reef fish fishery (NMFS 2005c).

A recently completed biological opinion (NMFS 2005c) conducted for the Gulf reef fish fishery evaluated the effects of reef fish fishing activities in the Gulf EEZ and found that mortalities of endangered and threatened species are uncommon from hook-and-line gear used in the reef fish fishery and were not likely to jeopardize the continued existence of threatened or endangered species. Assessments of the level of take were not then considered a high priority. However, the opinion did identify two reasonable and prudent measures. These were:

- 1) NMFS must ensure that any caught sea turtle or smalltooth sawfish is handled in such a way as to minimize stress to the animal and increase its survival rate.
- 2) NMFS must ensure that monitoring and reporting of any sea turtles or smalltooth sawfish encountered: a) detects any adverse effects resulting from the GOM reef fish fishery; b)

assesses the actual level of incidental take in comparison with the anticipated incidental take documented in that opinion; c) detects when the level of anticipated take is exceeded; and d) collects improved data from individual encounters.

Amendment 18A to the Reef Fish FMP was approved by the Gulf Council in October 2005 and, if implemented, will establish regulations to minimize stress to endangered species incidentally caught in the fishery.

6.3 Economic Environment

The grouper fishery in the GOM is comprised of the DWG fishery, in which yellowedge grouper is the dominant species, and the SWG fishery, in which red grouper and gag are the dominant species. The vast majority of the human activity related to the grouper fishery occurs in Florida. The recreational fishery is comprised of various classes of recreational fishermen: private anglers as well as charter, head and party-boat operators and their customers. From 2000-2004, recreational landings of red grouper accounted for 26 percent of total red grouper landings, while recreational landings of gag accounted for approximately 58 percent of the total gag landings.

6.3.1 Harvest

The recreational fishery in the Gulf includes private anglers fishing from shore, private or rental boats, or charterboats and headboats (party boats), with charterboats and headboats collectively known as for-hire vessels. The recreational sector is a very important component of the overall reef fish fishery in the Gulf of Mexico.

Reef fish harvests have been recorded through the MRFSS since 1979; however, data collected prior to 1981 is no longer used due to revisions in the estimation procedures that could not be applied to the earlier years of data. The MRFSS and For-Hire Survey cover the shore, private/rental boat, and charterboat modes for Alabama, Florida, Louisiana, and Mississippi. The SEFSC's Headboat Survey has covered the headboat sector in all states in the Gulf of Mexico since 1986. Texas private and charterboat landings are estimated through the Texas Parks and Wildlife Department recreational survey.

Table 6.3.1 contains the landings of red grouper and gag, the two most important grouper species caught by the recreational sector. For these species, the dominant fishing mode is the private/rental mode, followed by charter mode, and then by headboat. The shore mode accounts for very low landings of gag and red grouper.

6.3.2 Anglers

In 2003, approximately 3.3 million in-state anglers (anglers who fished within their state of residence) took almost 23 million trips and caught over 167 million fish. These totals do not include activity occurring solely in Texas (all modes) or in the headboat sector (all Gulf states). More than 70 percent of these anglers fished in Florida, followed by, in decreasing order, Louisiana, Alabama, and Mississippi. Similarly, Florida accounted for a large percentage of the

trips (70 percent), followed in order by Louisiana, Alabama, and Mississippi. The most commonly caught non-bait species were spotted seatrout, red drum, gray snapper, white grunt, sand seatrout, sheepshead, red snapper, king mackerel, and Spanish mackerel.

Social and economic characteristics of recreational anglers are collected periodically as an add-on survey to the MRFSS. Holiman (1999) and Holiman (2000) summarize the data from the 1997-1998 survey. Table 6.3.2 contains some of the major findings of this survey.

The typical Gulf marine recreational angler was 44 years old, male (80 percent), white (90 percent), employed full time (92 percent), and had an average annual household income of \$42,700. The average number of years fished in the state was 16. The average number of fishing trips taken in the 12 months preceding the interview was approximately 38 and these trips were mostly (75 percent) one-day trips. The average expenditure on the intercepted trip was less than \$50. Seventy-five percent of the surveyed anglers reported they held saltwater licenses, and 59 percent owned boats used for recreational saltwater fishing. Those anglers who did not own their own boat spent an average of \$269 per day on boat fees when fishing on a party/charter or rental boat. About 76 percent of the surveyed anglers were employed or self-employed and the majority of those unemployed were retired.

Using the 1997-1998 socioeconomic data, Haab et al. (2001) estimated three types of economic values: 1) Value of access to sites for individual anglers; 2) value of access to species for individual anglers; and, 3) value associated with changes in the ability of anglers to catch fish. The value for site access is generally interpreted as the value lost when a fishing site is closed to fishing. An analogous interpretation holds for the species access value; that is, it is the value associated with a prohibition for fishing for a specific fish species. The value of a unit increase in species caught and kept refers to the angler's valuation of the worth of an extra fish caught and kept above expenditures.

Haab et al. (2001) estimated the following values associated with the private/rental fishing mode. The economic loss per trip from closing a fishing site ranged from \$1.44 in Alabama to \$71.84 in West (Gulf) Florida. The loss was also estimated to be relatively high in Louisiana. The economic loss per trip from unavailability (closure) of snapper-grouper ranged from \$0.30 in Alabama to \$5.24 in West Florida, whereas the value of a unit increase in the catch of snapper-grouper ranged from \$0.27 in Alabama to \$4.15 in West Florida. For all fishing modes, the economic loss per trip from closing a fishing site ranged from \$1.84 in Alabama to \$54.14 in West Florida, whereas the economic value from a unit increase in the catch of bottom fish (which include other reef fish species) ranged from \$3.47 in Alabama to \$3.65 in West Florida.

6.3.3 For-hire Vessels

A federal for-hire vessel permit has been required for reef fish since 1996. A moratorium on the issuance of new for-hire vessel permits for reef fish took effect on June 16, 2003. The current 3-year moratorium is set to expire on June 16, 2006. In July 2005, the Council approved an amendment that, if implemented, would establish a limited access program for the for-hire reef fish and CMP fisheries. This limited access program would replace the current moratorium.

NMFS has issued 3,340 permits associated with 1,779 unique vessels. Of these vessels, 1,625 have reef fish permits (GMFMC 2005)

Approximately 79 percent of the for-hire vessels (1,404) have a maximum capacity of 6 or fewer passengers. The rest are distributed relatively evenly among the other passenger capacity classes, with 61 vessels in the highest category of greater than 60 passengers. The majority (82 percent) of the vessels are in the 21-50 foot length range and 70 percent have engines ranging from 101 to 600 horsepower. Individual ownership is the dominant form of ownership type (69 percent). A little less than a third of vessels are corporate-owned. Florida is the homeport of 61 percent of all federally permitted for-hire vessels, followed by Texas (13 percent), Alabama (8 percent), Louisiana (8 percent), and Mississippi (4 percent). Approximately 5 percent of all vessels are homeported in non-gulf states, with North Carolina being the dominant homeport state outside the Gulf of Mexico.

Permitted for-hire vessels engage in many activities. Some operate only as charterboats, some only as headboats, and others in various combinations as charterboats, headboats, and commercial fishing vessels. The possession of a for-hire vessel permit does not require a vessel to operate solely as a for-hire vessel, although the for-hire permit does prohibit the vessel from exceeding the maximum number of passengers specified by the permit.

Financial information on the for-hire vessels in the Gulf is not routinely collected. The most recent data available are from two MARFIN-funded studies conducted in 1998-1999 and summarized in Holland et al. (1999) and Sutton et al. (1999). Selected financial statistics from these studies are summarized in Table 6.3.3. Included in the cost estimates are bookkeeping services, advertising and promotion, fuel and oil, bait expenses, docking fees, food/drink for customers and crew, ice expenses, insurance expenses, maintenance expenses, permits and licenses, and wage/salary expense. The cost calculations do not account for capital expenses, other fixed costs and returns to owners/operators. The 1999 figures have been adjusted to 2004 dollars using the producer price index for all commodities, with 1982-1984 as the base year.

As expected, since they carry larger passenger loads, headboats earn substantially higher revenues than charterboats. The average charterboat is estimated to generate \$76,960 in annual revenues and \$36,758 in annual profits, whereas the appropriate values for the average headboat are \$404,172 and \$338,209, respectively. On average, both types of operations are profitable, with the headboat operation showing a relatively large profit figure. As mentioned above, however, the calculation of costs does not take into account fixed costs, which would be expected to be much larger for headboats. For both charterboats and headboats, the number of passengers carried per trip is about half of the maximum passenger capacity. Therefore, substantial excess capacity exists in the sector.

Table 6.3.4 depicts the for-hire sector by geographical areas. Florida vessels, on average, earn less than those in the rest of the Gulf. This difference may be due partly to the difference in the size of charterboat or headboat operation. On average, Florida vessels are smaller in size, have smaller horsepower, have lower maximum passenger capacity and take fewer passengers per trip. Another potential reason for the difference, although not apparent from the information provided,

is the increased competition created by the larger number of vessels in the state.

6.4 Social Environment

A "fishing community" is defined in the MSFCMA, as amended in 1996, as "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (MSFCMA section 3(16)). In addition, the National Standard guidelines (May 1, 1998; 63FR24211) define a fishing community as a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent service and industries (for example, boatyards, ice suppliers, tackle shops).

6.4.1 Measures of Fishing Dependence

Social and cultural research suggests that assessments of regulatory impacts on fishing-dependent communities consider not only geographic definitions of communities and economic characteristics therein, but also the level of vulnerability or resilience, of fishing communities and operations (McCay 2000). That is, questions of fishing dependence and "sustained participation" in fisheries must consider how able participants in a given fishery can move among fishery sectors, and how able they are to move out of the fishery altogether into alternative employment opportunities. Studies must take into account not only the economic characteristics but also the demographic and social characteristics of the areas where fishing activity occurs and strategies for assessing and ranking these characteristics and variables must be developed and analyzed. Some factors that have been previously used to assess a community's dependence on fishing include:

- 1) Economics, including percent employment in fishery-related industries, and unemployment levels, and income;
- 2) Fisheries characteristics, including landings by species by various sectors;
- 3) Fishing-related businesses, for example numbers of marinas, rentals, snorkel and dive shops, boat dockage and repair facilities, tackle and bait shops, fish houses, and lodgings related to recreational fisheries industry;
- 4) Fishing-related activities, such as seafood festivals;
- 5) Presence of organizations
- 6) Numbers of dealers/ processors
- 7) Isolation or integration of the fishery into alternative economic sectors (Do the fishers represent a political-economic enclave or are they integrated into the community?);
- 8) Percent of population in fishery or fishery-related industry;
- 9) Percentage of income derived from fishing;
- 10) Time commitment (number of months per year, and number of years of experience, etc.);
- 11) Flexibility index (number of species able to fish, gears/vessels, etc.);
- 12) Number of different kinds of vessels;
- 13) Relationship to the seafood marketing/processing sector;
- 14) Vessel sizes and sizes of crew by port/ dockage site;

15) Diversity of species targeted, gear, type and size and vessel by port/ dockage site;

Although these factors do not represent a comprehensive list of all factors that could be considered when defining a fishing community, they provide a snapshot of factors that represent or can be used to assess a community's dependence on fishing. There is very little qualitative information on fishermen, fishing-dependent businesses, or communities that depend on the GOM reef fish fishery. Social science research is currently being conducted by NMFS in communities in the Gulf of Mexico. Until this research is completed, and in-depth community profiles are developed for some sample communities, it is not possible to fully understand the possible impacts of any change in federal fishing regulations in the reef fish fishery.

6.4.2 Grouper Fishing Communities

Current data describing GOM reef fish fishing communities is limited to information from fishery permits and reported landings (see Section 4). Additional research is needed to assess the overall dependence on fishing of each of the communities described below

Holland et al. (1999) identified the following areas as major activity centers for charterboats in Florida: Miami, Fort Lauderdale, Key West, Marathon, Islamorada, Naples, Ft. Myers, Ft. Myers Beach, Panama City, Panama City Beach, Destin and Pensacola. They also identified the following as major activity centers for headboats in Florida: Miami, Key West, Marathon, Islamorada, Ft. Myers, Ft. Myers Beach, Clearwater, Destin, Panama City and Panama City Beach. Sutton et al. (1999) identified the following areas as major activity centers for charterboats in the rest of the Gulf: South Padre Island, Port Aransas, and Galveston-Freeport in Texas; Grand Isle-Empire-Venice in Louisiana; Gulfport-Biloxi in Mississippi; and, Orange Beach-Gulf Shores in Alabama. They also identified the following areas as major activity centers for headboats in the rest of the Gulf: South Padre Island, Port Aransas, and Galveston-Freeport in Texas and Orange Beach-Gulf Shores in Alabama.

In general, many areas with substantial involvement in fishing have small populations (less than 7,000 persons); for example, Apalachicola, Carrabelle, Cedar Key, Cortez, Homosassa, Ft. Myers Beach, Everglades City, Madeira Beach, and Stock Island. Several of these areas have an unusually high rate of people with less than a high school education, some as high as 50 percent. With exceptions (Carrabelle, 13.6 percent and Cedar Key, 12.2 percent), many of the areas have relatively low percentages, 2-3 percent, counted as employed in agriculture, forestry and fishing. In areas such as these, with lower population bases, less educated workforces, and fewer opportunities in similar professions, losing fishing opportunities will impact the area relatively more than in areas with a more diverse working conditions.

Profiles of the communities relevant to management of the grouper fishery do not currently exist. Additional information on these communities can therefore not be provided at this time.

6.4.3 Regulatory Impacts on Fishing Communities

Fishing communities can be impacted in a variety of ways by regulations. Wilson et al. (1998)

outlined three categories of impacts on fishing communities: 1) Those that “affect the volume of money that is going through the community;” 2) those that “affect the flexibility of the fishing operations;” and 3) those that “impose direct costs on fishing operations.”

The actions proposed herein will ultimately impose direct costs on fishing operations and losses in net revenue for some fishing communities or areas. The direct and indirect effects of these proposed regulations are described in detail in Sections 4 and 5.

6.5 Administrative Environment

6.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the MSFCMA (16 U.S.C. 1801 et seq.). The MSFCMA claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ and authority over US anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making in the GOM is divided between the Secretary and the GMFMC. The GMFMC is responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. Currently the Council has FMPs for coastal migratory pelagics, reef fish, coral and coral reefs, spiny lobster, stone crabs, red drum, and shrimp. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the MSFCMA, and with other applicable laws. In most cases, the Secretary has delegated this authority to NMFS.

A variety of commercial and recreational fishing regulations have been implemented for GOM fisheries, including: quotas, limited entry programs, bag limits, trip limits, closed seasons and areas, and size limits. These regulations have been established to reduce fishing mortality, reduce fishing effort, rebuild fish stocks, and protect spawning fish.

The SEFSC conducts a variety of research and monitoring activities to support management of fishery resources in the Gulf of Mexico and South Atlantic. Some of the activities conducted by the SEFSC include: biological and socio-economic research, collection of landings and fishing effort data, monitoring quotas, and conducting stock assessments.

Federal fishing regulations are enforced through actions of NOAA’s Office of Law Enforcement, the United States Coast Guard (USCG), and various state authorities. To better coordinate enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the MSFCMA.

6.5.2 State Fishery Management

State representatives participate on the Council in order to ensure participation in federal fishery management decision-making and to promote the development of compatible regulations in state

and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries including enforcement of fishing regulations. Each of the five Gulf states exercises legislative and regulatory authority over their natural resources and cooperate with numerous state and federal regulatory agencies when managing marine resources. Additional information about each state's marine fisheries management agency can be found at:

Alabama Department of Conservation and Natural Resources – www.dcnr.state.al.us

Florida Fish and Wildlife Conservation Commission – www.myfwc.com/marine

Louisiana Department of Wildlife and Fisheries – www.wlf.state.la.us

Mississippi Department of Marine Resources - www.dmr.state.ms.us

Texas Parks and Wildlife Department - www.tpwd.state.tx.us

7 ENVIRONMENTAL CONSEQUENCES

This section provides the scientific and analytical basis for comparing the alternatives described in Section 3.0. The potential direct, indirect, and cumulative effects on the physical, biological, socioeconomic, and administrative environments for each management alternative are described below. This section also describes: 1) any unavoidable adverse effects resulting from the proposed action, 2) the relationship between short-term uses of man's environment and long-term productivity, and 3) any irreversible or irretrievable commitments of resources resulting from implementation of the proposed action.

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

7.1 Direct and Indirect Effects on the Physical Environment

7.1.1 Action 1: Red Grouper Landings Limits

Alternative 1 (status quo/no action) would maintain status quo regulations, which include a two red grouper daily bag limit and 20-inch minimum size limit. The primary effects of the recreational grouper fishery on the physical environment generally result from fishing gear interactions with the sea floor. Regulations, such as increases in size limits, can increase the amount of time spent fishing and result in increased effort and more gear interactions with the seafloor.

Fishing gear can damage or disturb bottom structures and occasionally incidentally harvest such habitat. Direct effects resulting from **Alternative 1 (status quo/no action)** include physical damage to habitat associated with hook-and-line tear-offs and abrasions, and anchoring (Barnette, 2001). Longer-term indirect effects would result if hook-and-line gear is not removed and causes marine life to become entangled or overgrown with algae (Hamilton 2000; Barnette 2001). In the short-term, the effects of **Alternative 1 (status quo/no action)** are not likely to be different than current fishery conditions. Also, because the recreational red grouper fishery represents a minor component (~26 percent) of the overall reef fish fishery, adverse impacts on the physical environment are small relative to the overall reef fish fishery.

Alternative 2 would reduce the red grouper daily bag limit to one and establish a three red grouper daily vessel limit. This alternative could result in short-term beneficial effects to the physical environment if anglers stop fishing once reaching their bag or vessel limit. The reduced time spent harvesting red grouper would result in less gear interactions with the seafloor. However, because red grouper are part of a multispecies fishery, reductions in fishing effort (time spent fishing) are unlikely to occur because anglers would continue targeting other grouper that co-occur with red grouper until the aggregate daily bag limit is reached. Overall, the

benefits to the physical environment of **Alternative 2** are expected to be small and unquantifiable when compared to **Alternative 1** and the other alternatives.

Alternative 3 would increase the minimum size limit to 22-inches TL. **Alternative 3** would likely result in small negative effects on the physical environment in the short-term if size limits increase the amount of time anglers spend fishing to catch legal-size red grouper and fill their daily bag limit. Any additional time spent fishing would result in additional gear interactions with habitat. However, because hook-and-line gear is considered to have less damaging effects than other less-selective fishery gears, any negative effects associated with size limits are expected to be small and unquantifiable when compared to the other alternatives.

Alternative 4 would reduce the red grouper daily bag limit from two to one and establish a closed season during either August (**Alternative 4A**) or April-May (**Alternative 4B**). These alternatives would result in positive short-term direct benefits to the physical environment if the closed seasons and lower daily bag limit deter anglers from taking fishing trips. If anglers take less fishing trips or target coastal migratory pelagics, which are caught at or near the surface, fewer gear interactions with physical habitat would occur during closure months. Phone calls and public workshop comments from charter boat operators during development of interim red grouper regulations (NMFS 2005b) indicated closed seasons would result in fewer bookings and less trips, especially in southwest Florida. **Alternatives 4A-B** would have greater positive effects on the physical environment than **Preferred Alternative 5**, which includes a seasonal closure (as well as a lower daily bag limit) from February 15-March 15, because the closed seasons would occur during spring or summer when weather is better and fishing effort for grouper is greater. The two-month closure proposed in **Alternative 4B** would likely have a greater positive benefit to the physical environment than **Alternative 4A** because the grouper fishery would be closed for two months rather than just one. However, the benefits of **Alternatives 4A-B** to physical habitat are expected to be small and cannot be quantified, when compared to **Alternative 1** or the other alternatives. Additionally, if these alternatives do not deter fishermen from taking fishing trips and targeting other species (e.g., snappers, amberjack) during the closures, than any benefits to the physical environment may be negated.

Preferred Alternative 5 would reduce the red grouper daily bag limit from two to one and establish a recreational closed season from February 15 to March 15 for red grouper, black grouper, and gag. This alternative would result in similar, although potentially less beneficial, effects to the physical environment than **Alternatives 4A-B**. As mentioned above, grouper landings and fishing effort are lower at the beginning and end of the year and peak during the summer when weather is better. Implementation of a closed season during February 15-March 15 would effect less trips than closures proposed in **Alternatives 4A** and **B**, therefore reducing effort and interactions with habitat less (see Table 7.3.4). The lower daily bag limit would potentially deter some fishermen from targeting red grouper. Additionally, once fishermen reach their daily bag limit, they may stop fishing. If **Preferred Alternative 5** does not deter fishermen from taking fishing trips and targeting other species (e.g., snappers) during the closure, than any benefits to the physical environment may be negated. Also, because red grouper are part of a multispecies fishery, reductions in fishing effort (time spent fishing), with the exception of the grouper closure, are unlikely to occur because anglers would continue targeting other reef fish species that reside at similar habitat as red grouper, black grouper, and gag. Overall, the benefits

to the physical environment of **Preferred Alternative 5** are expected to be small and unquantifiable when compared to the other alternatives.

Alternative 6 would reduce the red grouper daily bag limit from two to one and increase the minimum size limit to 21 inches TL. This alternative would result in similar, although slightly less, effects to the physical environment than **Alternative 3**. Small negative effects to the physical environment would result if the increase in the minimum size limit increases the amount of time anglers spend fishing to catch legal-sized red grouper and fill their daily bag limit. Any additional time spent fishing would result in additional gear interactions with habitat. However, because hook-and-line gear has less damaging effects than other less-selective fishery gears, any negative effects associated with size limits are expected to be small and unquantifiable when compared to the other alternatives. The small negative effects to the physical environment from the size limit could be partially negated by a decrease in the daily bag limit. Reducing the daily bag limit to one and potential reductions to the aggregate daily bag limit for grouper (see section 7.1.4) could reduce the amount of time anglers spend fishing, because they would reach their daily bag limit faster.

Alternative 7 would reduce the red grouper daily bag limit from two to one, establish a three red grouper daily vessel limit for vessels not possessing a Coast Guard Certificate of Inspection (COI), and establish a daily vessel limit of one red grouper per two paying passengers for vessels possessing a COI. This alternative would result in similar effects to the physical environment as **Alternative 2**.

7.1.2 Action 2: For-hire Captain and Crew Daily Bag Limit

Alternative 1 would maintain status quo regulations, which allow captain and crew to retain daily bag limits of grouper while under charter. This alternative is expected to have no measurable direct or indirect effects on the physical environment, because captain and crew represent only a small portion of persons fishing while under charter. Crew may occasionally fish while under charter, but more often assist clients who are fishing. Because charter vessels and headboats account for only 20-25 percent of the annual recreational grouper landings in the Gulf of Mexico, captain and crew likely account for only a small fraction of overall fishing effort. Additionally, most charter vessels and headboats use hook-and-line gear, which is less damaging than other less selective gear types.

Preferred Alternative 2 would prohibit captain and crew from retaining daily bag limits of grouper while under charter. This alternative is not expected to have any measurable direct or indirect effects when compared **Alternative 1**, because it will not greatly change existing fishing practices. Additionally, charter vessels and headboats account for only a small portion (20-25 percent) of the annual recreational grouper landings in the Gulf of Mexico, and therefore any changes in fishing effort due to captain and crew prohibitions are expected to be small relative to overall grouper fishing effort and gear interactions with habitat.

7.1.3 Action 3: Aggregate Grouper Daily Bag Limit

The effects of hook-and-line fishing on the physical environment are described in Section 7.1.1

and 7.1.2. **Preferred Alternative 1 (no action)** would maintain the five grouper aggregate daily bag limit. This alternative is not expected to reduce landings or change the gears used for harvest. Direct effects resulting from **Preferred Alternative 1 (no action)** would include physical damage to habitat associated with hook-and-line tear-offs and abrasions, and anchoring. Indirect effects would result if hook-and-line gear is not removed and causes marine life to become entangled or overgrown with algae. In the short-term, the effects of **Preferred Alternative 1** are not likely to be different than current fishery conditions. **Preferred Alternative 1** is not expected to significantly impact the physical environment because the recreational fishery primarily occurs over hard bottom habitat and represents only a small portion of the overall reef fish fishery.

Alternatives 2-4 would reduce the aggregate daily bag limit to 4, 3, or 2 fish. Positive short-term benefits could result from these alternatives if the lower daily bag limits deter anglers from bottom fishing or deter anglers from taking trips to harvest grouper. However, it is estimated that less than 10 percent of fishing trips would be affected by lowering the aggregate daily bag limit (Strelcheck 2005b), implying that few anglers currently keep 2 to 4 grouper per trip. Therefore, lower aggregate daily bag limits alone are not likely to deter anglers from targeting grouper, so the direct and indirect affects on the physical environment as described for **Preferred alternative 1** would continue. If the lower the aggregate daily bag limit causes anglers to target other non-bottom species, such as coastal migratory pelagics, positive short-term benefits would result. Coastal migratory pelagics are caught with hook-and-line near the surface, and therefore hook-and-line gear has minimal or no contact with physical habitat. Overall, the short-term benefits of **Alternatives 2-4** are expected to be small and likely indistinguishable from **Preferred Alternative 1**.

If lower aggregate daily bag limits are combined with a one red grouper daily bag limit and/or vessel limits and closed seasons (**Alternatives 2, 4A-B, 5, 7, Action 1**), additional positive benefits to the physical environment could result beyond those described in Section 7.1.1. Additional positive benefits would occur if the combination of these regulations further deters anglers from targeting grouper or taking fishing trips. Closed seasons combined with a lower aggregate daily bag limit are expected to have the greatest benefits to the physical environment (**Alternative 4A-B and Preferred Alternative 5, Action 1**). However, the overall benefits to the physical environment are expected to be small and unquantifiable because hook-and-line is a less damaging gear than most other gears. Also, grouper are primarily harvested over hard-bottom habitat and recreational landings represent a small component of the overall landings.

7.2 Direct and Indirect Effects on the Biological Environment

7.2.1 Action 1: Red Grouper Landings Limits

Alternative 1 (no action) would maintain existing regulations for red grouper, which include a 20-inch size limit and a two fish daily bag limit. If these regulations remain unchanged the status of the stock could potentially worsen because overfishing would likely continue. This would result in negative effects on the biological and ecological environment. Currently, red grouper is under a rebuilding plan and the stock is classified as undergoing overfishing (NMFS 2004c).

During the second year of the rebuilding plan, recreational landings were well above the specified recreational target catch level and the ABC specified by the rebuilding plan was exceeded. If future recreational landings are similar to average landings during 2003-2005, **Alternative 1 (no action)** would allow landings to continue to exceed the ABC and recreational target catch level. This could directly jeopardize the rebuilding plan for red grouper and result in additional regulatory actions and reductions in ABC in the future to rebuild the fishery. In the long-term if overexploitation is allowed to continue, changes to the age and size structure, genetic diversity, geographic range, and reproductive capacity of the stock may occur.

Red grouper are a part of a multispecies fishery that includes other grouper and snapper. Maintaining existing regulations would not affect bycatch in the short-term because **Alternative 1 (no action)** does not change the methods or gears used for harvest. Bycatch could increase without implementation of new regulations if fishing effort (number of trips or number of vessels fishing) increases or the status of the stock worsens, but this would be no different than current fishery conditions. In 2004, it was estimated that 88 percent of all red grouper caught were released. The most recent stock assessment (SEFSC 2002) assumed a recreational release mortality rate of 10 percent for red grouper. Applying this release mortality rate to the number of annual MRFSS releases, it is estimated that approximately 42 percent of all red grouper dying each year die from release mortality (see Table 3.6).

The most recent yield-per-recruit (YPR) analysis for red grouper was conducted in the 1993 stock assessment (Goodyear and Schirripa 1993). Based on the assessment, YPR is maximized at 18 inches TL assuming a 33 percent release mortality rate, 19 inches TL assuming a 20 percent release mortality rate, and 25 inches TL assuming no release mortality. The assessment did not evaluate YPR for a release mortality rate of 10 percent, which was the release mortality rate used for recreational caught fish in the last assessment (SEFSC 2002). Extrapolating from the 1993 stock assessment YPR models, YPR is likely maximized between 20 and 22 inches TL.

Based on the von Bertalanffy age-length equation used in the most recent stock assessment (SEFSC 2002), average age-at-first capture is estimated to be 4.42 years at 20-inch TL, 4.84 years at 21-inches TL, 5.3 years at 22-inches TL, 5.81 years at 23-inches TL, and 6.39 years at 24-inches TL (Figure 3). Increasing the minimum size limit by one inch would result in an additional 5-6 months (on average) for red grouper to recruit to the fishery. A 22-inch TL size limit would result in an additional 11-12 months (on average) for red grouper to recruit to the fishery.

Red snapper, vermilion snapper, gag, white grunt, gray triggerfish, red pogy, gray snapper, lane snapper, greater amberjack, and king mackerel are all commonly caught on trips targeting or catching red grouper (see Section 3.2.1.5). With the exception of white grunt and red pogy, each of these species is regulated by bag limits and size limits to control or limit landings. Red snapper is the only recreational fishery with a seasonal closure. Several of these species are overfished (greater amberjack), undergoing overfishing, or both (vermilion snapper, red snapper). Several other species are either fully utilized or have been recently rebuilt and recovered from overfishing (king mackerel, gag). In the short-term, **Alternative 1 (no action)** will not likely have adverse effects on these fisheries beyond the mortality already imposed. In the long-term, landings and fishing effort directed toward these other species could increase if

the status of red grouper worsens due to continued overfishing.

Alternative 1 (no action) is not expected to have any adverse effects on protected or threatened species. Recreational anglers infrequently take sea turtles and whales do not overlap geographically with the recreational fishery. Adult smalltooth sawfish do occur in water depths overlapping red grouper habitat, but few are incidentally caught by recreational anglers (NMFS 2005c). A recently completed biological opinion (NMFS 2005c) estimated the recreational fishery took 111 hard shell turtles, 40 of which died, during 2001-2003. The biological opinion also estimated that four smalltooth sawfish were caught and released by hook-and-line reef fish anglers during this same time period (NMFS 2005c). **Alternative 1 (no action)** is not expected to change the number of turtles or smalltooth sawfish taken because it does not change the gears or methods of harvest. The Council approved Amendment 18A to the Reef Fish FMP at their October 2005 meeting. Amendment 18A includes measures for mitigating and potentially reducing the number of sea turtles discarded dead by the reef fish hook-and-line fishery.

Alternative 2 would reduce the red grouper daily bag limit from two to one fish and establish a three red grouper daily vessel limit. This alternative would positively benefit red grouper by reducing recreational landings by 39 percent.

Alternative 2 will likely result in some negative biological effects if the lower daily bag limits and vessel limits result in increased bycatch and regulatory discards. Because red grouper co-occur with many other snappers and grouper, red grouper dead discards could increase if fishermen continue to target other species once reaching their one red grouper daily bag limit. **Alternative 2** could also have short-term impacts on gag, and other grouper. Lowering the red grouper daily bag limit and vessel limit could shift effort to gag and other species, resulting in increased landings and fishing mortality. Gag is currently not overfished or undergoing overfishing, but the fishery is considered to be fully utilized. The effects on protected resources are expected to be similar to **Alternative 1 (no action)**, because the hook-and-line reef fish fishery takes few protected species.

Alternatives 3 would increase the minimum size limit for red grouper to 22-inches TL. This alternative may positively benefit the red grouper stock by reducing overall landings. A 22-inch size limit is estimated to reduce recreational landings by 32 percent. However, similar increases in the minimum size limit for gag in 2000 (increased from 20 to 22-inches TL) have not resulted in reductions in gag landings. In fact, landings after implementation of the 22-inch gag minimum size limit were slightly higher than landings before implementation of the size limit increase. Additionally, the number of gag released increased by 72 percent after the size limit change.

Reductions in landings would result in increases in the number of fish released and discarded dead. As described in **Alternative 1 (status quo/no action)**, 88 percent of red grouper caught by recreational anglers are currently released and discard mortality accounts for approximately 42 percent of the total mortality in the recreational red grouper fishery (see Table 3.4). Increasing the minimum size limit to 22 inches would increase the amount of time it takes for red grouper to recruit to the fishery by 11 to 16 months, during which time red grouper would be susceptible to additional natural and release mortality (Strelcheck 2005c). Increases to the minimum size limit

could also result in forgone yield. Extrapolating from the 1993 stock assessment (Goodyear and Schirripa 1993), yield is maximized between 20 and 22 inches TL. **Alternative 3** is at the upper range of size limits that would potentially maximize red grouper yield.

Alternative 3 could also result in negative short-term effects on other grouper if the increased size limits result in effort shifting to gag, and other reef fish and coastal migratory pelagic species. Currently, several reef fish and coastal migratory pelagics are either overfished, undergoing overfishing, or considered to be fully utilized. Unlike **Alternatives 4** and **5**, size limit increases would not protect gag and other SWG and DWG from increases in fishing mortality if effort shifts due to red grouper regulatory actions. The effects on protected resources are expected to be similar to **Alternative 1** (no action), because the hook-and-line reef fish fishery takes few protected species.

Alternative 4 would reduce the red grouper daily bag limit from two to one red grouper per angler and establish a closed season for all grouper during August (**Alternative 4A**) or April-May (**Alternative 4B**). These alternatives are estimated to have a positive biological benefit on the red grouper fishery and reduce recreational red grouper landings by 40 to 43 percent, depending on the length of the closed season. A one red grouper daily bag limit combined with an April-May closed season (**Alternative 4B**) would have the greatest biological benefits to red grouper and result in the greatest reductions in landings. **Alternative 4A** would result in slightly less reductions in red grouper landings, but would close the fishery for only one month rather than two. A closure during April and May would provide added benefits to the red grouper stock, because the recreational fishery would be closed during peak spawning (Collins et al. 2002)

Alternatives 4A-B would likely result in some negative biological effects if the lower daily bag limit results in increased bycatch and regulatory discards. Positive biological impacts to both red grouper and other grouper would result from the closed seasons. Because red grouper are part of a multispecies fishery, prohibiting the landing of all grouper would reduce discards by hook-and-line fishermen during closure months. Gag, black grouper, and other SWG and DWG are caught when targeting red grouper, so establishing closed seasons for all grouper would also prevent hook-and-line and spear fishermen from redirecting effort to other species because of red grouper management actions. Although not proposed in this EA, implementing a closure only for red grouper would increase red grouper discards during closure months when anglers are targeting other grouper that co-occur with red grouper. Closures would have positive biological benefits on gag, and other grouper, by reducing landings and fishing mortality for these species. Gag is considered fully utilized and landings in recent years have exceeded the ABC recommended by the 2001 RFSAP. Some negative biological effects could occur if anglers continue to target other reef fishes that co-occur with grouper, resulting in increased dead discards of grouper. Based on 2004 MRFSS data, red and vermilion snapper are the most commonly harvested non-grouper species on trips harvesting red grouper. Both closed seasons proposed in **Alternative 4** would be during periods when the red snapper and vermilion snapper recreational fisheries are open.

It is estimated landings of grouper, excluding red grouper, would be reduced by 8 or 19 percent depending on the closure chosen, and assuming no effort shifting occurs. **Alternative 4A** would

reduce recreational landings of grouper, excluding red grouper, by 8 percent. **Alternatives 4B** would reduce recreational landings of grouper, excluding red grouper by 19 percent.

Similar to **Alternatives 1-3**, **Alternatives 4A-B** are expected to have similar effects on protected resources, because few are taken by the hook-and-line reef fish fishery. Overall, **Alternatives 4A-B** are expected to have greater biological benefits for red grouper and other grouper than **Alternatives 1 (status quo/no action)** and **2**, because these alternatives reduce red grouper bycatch to a greater extent and reduce the landings of other grouper species commonly occurring in the same areas and habitat as red grouper. **Alternatives 4A-B** could result in increased negative effects on reef fish other than grouper, as well as coastal migratory pelagic species, if anglers target those species during grouper closures, resulting in increased landings and fishing mortality.

Preferred Alternative 5 would reduce the red grouper daily bag limit from two to one and establish a February 15 through March 15 closure for gag, black grouper, and red grouper. This alternative is estimated to reduce the landings of red grouper by 33 percent, and the landings of black and gag grouper by 7 percent.

Preferred Alternatives 5 would likely have some negative biological effects if the lower daily bag limit results in increased discards. Positive biological impacts to red grouper, gag, and black grouper would result from the closed season. Because red grouper are part of a multispecies fishery, prohibiting gag, red grouper, and black grouper from being landed would reduce dead discards during closure months. The recreational seasonal closure would correspond to the peak in spawning for gag (Hood and Schlieder 1992) and would provide added protection to black grouper and red grouper during spawning. The closure would also result in additional reductions in red grouper landings.

Gag and black grouper are commonly caught when targeting red grouper, so establishing a closed season for all three grouper would reduce discard mortality for red grouper by hook-and-line fishermen and prevent effort by hook-and-line and spear fishermen from shifting to gag and black grouper if only the red grouper fishery was closed. Because the closure would overlap the commercial closure, additional benefits could result if the closure deters poaching, which some fishermen have indicated is occurring during the commercial grouper closed season. Closures for gag, black, and red grouper would have positive biological benefits by reducing landings and fishing mortality for these species. Some negative biological effects could occur if anglers continue to target other reef fishes that co-occur with these grouper, resulting in increased discard mortality of grouper. As mentioned above, vermilion and red snapper are the most commonly harvested non-grouper species on trips harvesting red grouper. The proposed closed season would occur when the red snapper fishery is also closed, resulting in no effort shifting toward red snapper.

The overall biological benefits of **Preferred Alternative 5** are expected to be slightly less than **Alternatives 4A** and **4B**. **Preferred Alternative 5** achieves a lower reduction in both red grouper and other grouper landings than **Alternatives 4A** and **B**. Biological benefits to red grouper from **Preferred Alternative 5** are expected to be greater than **Alternatives 3** and **6**, but less than **Alternatives 2** and **7**. Biological benefits to grouper, other than red grouper, are

expected to be greater for **Preferred Alternative 5** than all other alternatives, except **Alternatives 4A and B**. The effects on protected resources are expected to be similar to **Alternative 1** (no action), because the hook-and-line reef fish fishery takes few protected species.

Alternative 6 would reduce the red grouper daily bag limit from two to one and increase the minimum size limit to 21 inches TL. **Alternative 6** is estimated to reduce red grouper landings by 40 percent. Most of the reduction in landings results from reducing the red grouper daily bag limit. As mentioned in the discussion of **Alternative 3**, increasing the minimum size limit would result in additional red grouper discards, which would reduce the overall reduction in landings expected to be achieved (see Table 3.4). As described in **Alternative 1 (status quo/no action)**, 88 percent of red grouper caught by recreational anglers are currently released and discard mortality accounts for approximately 42 percent of the total mortality in the recreational red grouper fishery. Increasing the minimum size limit to 21 inches would increase the amount of time it takes for red grouper to recruit to the fishery by 5-6 months, during which time red grouper would be susceptible to additional natural and release mortality (Strelcheck 2005c). Increases to the minimum size limit could also result in forgone yield. Extrapolating from the 1993 stock assessment (Goodyear and Schirripa 1993), yield is maximized between 20 and 22 inches TL.

Alternative 6 could also result in negative effects on other grouper if the increased size limits result in effort shifting to gag, and other reef fish and coastal migratory pelagic species. Currently, several reef fish and coastal migratory pelagics are either overfished, undergoing overfishing, or considered to be fully utilized. Unlike **Alternatives 4 and 5**, size limit increases would not protect gag or other grouper from increases in fishing mortality if effort shifts due to red grouper regulatory actions. Gag is considered fully utilized and landings have been above the 2001 RFSAP's recommended ABC since 2001. The effects on protected resources are expected to be similar to **Alternative 1** (no action), because the hook-and-line reef fish fishery takes few protected species.

Alternative 7 would reduce the red grouper daily bag limit from two to one, establish a three red grouper daily limit for vessels not possessing a Coast Guard Certificate of Inspection (COI), and establish a daily vessel limit of one red grouper per two paying passengers for vessels possessing a COI. This alternative would reduce the recreational landings of red grouper by approximately 37 percent and would result in similar effects to the biological environment as **Alternative 2**. The vessel limits are slightly less restrictive for COI vessels than those proposed in **Alternative 2**.

Alternative 7 could result in negative biological effects if the lower daily bag limits and vessel limits result in increased bycatch and regulatory discards. Because red grouper co-occur with many other snappers and grouper, red grouper dead discards could increase if fishermen continue to target other species once reaching their one red grouper daily bag limit. **Alternative 7** could also have impacts on gag, and other grouper, if adjustments to the aggregate daily bag limit are not considered. Lowering the red grouper daily bag limit and vessel limit could shift effort to gag and other species, resulting in increased landings and fishing mortality. Gag is currently not overfished or undergoing overfishing, but the fishery is considered to be fully utilized and

landings have exceeded the 2001 RFSAP's recommended ABC since 2001. The effects on protected resources are expected to be similar to **Alternative 1** (no action), because the hook-and-line reef fish fishery takes few protected species.

Overall, none of the recreational management alternatives will significantly affect the biological environment because the recreational red grouper fishery only accounts for a small portion (approximately 27 percent during the past three years) of total annual red grouper landings. Each of the alternatives are expected to have positive biological benefits by reducing red grouper landings and returning recreational landings to levels specified in the red grouper rebuilding plan. As discussed above, some alternatives will likely have greater negative effects on bycatch and discards. Additionally some alternatives may have a greater impact on other grouper and reef fishes, because of shifts in effort due to more restrictive red grouper management measures. **Alternatives 4A and 4B and Preferred Alternative 5** would provide additional protection to other grouper species if effort is redirected as a result of regulations on red grouper. **Alternatives 3 and 6** would increase the minimum size limit and are expected to have the greatest negative effects on discard mortality. Similar concern is not as great under bag and seasonal adjustments since there is a greater expectation that targeted fishing will cease upon reaching the daily bag limit, and directed fishing will be reduced under seasonal closures, thereby reducing catch and release activity.

7.2.2 Action 2: For-hire Captain and Crew Daily Bag Limit

Alternative 1 would maintain status quo (no action) regulations and would continue to allow captain and crew to retain recreational daily bag limits for grouper while under charter. If the Council does not reduce the daily bag limit for red grouper or the aggregate grouper daily bag limit (as proposed in Actions 2 and 4), then this alternative would likely have little or no effect on reducing grouper landings. Currently, there is little incentive for captain and crew to supplement the catch of their clients, because few anglers on average report landing greater than the aggregate grouper daily bag limit or greater than the red grouper daily bag limit.

Preferred Alternative 2 would prevent charter captains and crew from supplementing their client's catch once their client's daily bag limits have been met, but would not prevent captain and crew from supplementing client's landings within the existing daily bag limit. **Preferred Alternative 2** is expected to result in only small unquantifiable reductions in landings because the for-hire sector represents only 20-25 percent of grouper landings and captain and crew account for a small portion of overall for-hire landings. .

7.2.3 Action 3: Aggregate Grouper Daily Bag Limit

Preferred Alternative 1 (status quo/no action) would maintain the five grouper aggregate daily bag limit. This alternative is not expected to reduce grouper landings and it would provide no additional reductions in red grouper, since the current red grouper daily bag limit is less than the aggregate daily bag limit. The five grouper aggregate daily bag limit has been in effect since implementation of Amendment 1 to the Reef Fish FMP in 1990. Based on 2003-04 MRFSS intercept data, only 5.5 percent of all trips intercepted landed more than four grouper per angler; indicating most trips do not catch the currently allowed aggregate limit (Strelcheck 2005b).

Maintaining the five grouper aggregate daily bag limit could have short-term negative effects on other grouper (i.e., increased landings, increased fishing mortality) if the red grouper daily bag limit is reduced. This would occur if anglers attempt to fill their aggregate limit with an additional non-red grouper, when previously they would have kept a second red grouper. However, the Council expects Preferred Alternative 5 in Action 1 (closing February 15 to March 15 to gag and black grouper as well as red grouper and reducing harvest of gag and black groupers by seven percent) will be sufficient to compensate for any increase in harvest of gag or black grouper during the remaining open season and for any increase in red grouper discards due to the one red grouper bag limit.

Preferred Alternative 1 (status quo/no action) is not expected to increase bycatch of other fish species or protected resources since it does not change the gears or methods used to harvest grouper, and does not reduce potential landings. As discussed in Section 4.2.1, mortalities of endangered and threatened species are uncommon from hook-and-line gear used in the reef fish fishery and are not likely to jeopardize the continued existence of threatened or endangered species. Because the aggregate grouper daily bag limit would remain unchanged, effort shifting to other fish species would not likely occur.

Alternatives 2-4 would reduce the aggregate daily bag limit to 4, 3, or 2 grouper. Positive short-term benefits to the biological environment would result from these alternatives. It is estimated that a 4, 3, and 2 grouper aggregate daily bag limit would reduce the recreational landings of grouper, excluding red grouper, by 3, 7 and 19 percent, respectively (Strelcheck 2005b). Reductions to the aggregate daily bag limit could result in negative effects to bycatch and discard mortality. Because grouper co-occur with other reef fishes, bycatch could increase if anglers continue targeting snappers, grunts, triggerfish, and jacks after reaching the aggregate grouper daily bag limit. **Alternative 4** would have the greatest negative effect on bycatch, because it is the most restrictive of the four alternatives. However, only 8.7 percent of all MRFSS intercepts reported landing greater than two grouper per angler in 2003-04; indicating few trips would likely target other species instead of grouper. Relative to the other alternatives, **Alternative 4** would provide the greatest benefits to grouper, excluding red grouper, followed by **Preferred Alternative 3**, **Alternative 2**, and **Preferred Alternative 1**. The more restrictive the aggregate daily bag limit, the more protection provided to other grouper if hook-and-line and spear fishermen redirect their effort as a result of more restrictive red grouper management measures. The effects on protected resources would be the same for all the alternatives, since hook-and-line reef fish anglers infrequently encounter protected resources.

If lower aggregate daily bag limits are combined with a one red grouper daily bag limit, vessel limits, and/or closed seasons (**Alternatives 2, 4A-B, 5, 6, or 7 in Action 1**), additional positive benefits to the biological environment could result beyond those described in Section 7.2.1. Gag and other grouper would be afforded additional protection from potential effort shifting due to more restrictive daily bag limits for red grouper. As mentioned above, a lower red grouper daily bag limit could encourage anglers to land another non-red grouper to replace the second red grouper they would have previously caught. The greater the reduction to the aggregate daily bag limit, the more likely fishing pressure and fishing mortality will be reduced for gag and other grouper species. If the aggregate daily bag limit reduction is combined with **Alternatives 4A-B or 5 in Action 1**, additional reductions in grouper landings, excluding red grouper would occur.

Lowering the aggregate daily bag limit combined with a lower red grouper daily bag limit and seasonal closure (**Alternatives 4A-B and 5 in Action 1**) for all grouper would result in the largest biological benefits to grouper because anglers would be prohibited from landing grouper during the closure. **Alternative 4** would provide the greatest level of protection for non-red grouper, followed by **Alternative 3**, **Alternative 2**, and **Preferred Alternative 1**.

7.3 Direct and Indirect Effects on the Economic Environment

7.3.1 Action 1: Red Grouper Landings Limits

Carter (2005) conducted an economic analysis of **Action 1** and **Action 3**. **Action 2**, which deals with captain and crew limits, cannot be quantitatively analyzed since current data collection programs do not support the identification of harvest activity by these individuals. Due to the relatively low grouper landings by the headboat and shore sectors, the analysis incorporated only the private/rental and charterboat modes, utilizing data from the MRFSS. In addition to the low overall grouper landings, the omission of the headboat sector in this analysis is not expected to be critical to the analysis since the vessel-level nature of headboat data only supports the generation of average daily bag limits across all anglers on the vessel and, therefore, would not likely indicate any effects, on average, of the alternative daily bag limits. However, the exclusion of the headboat sector will result in an underestimate of the impacts of closed seasons. The underestimation should be uniform, however, and not affect the ranking of the alternatives. Expected impacts on the Texas grouper fishery are also not included in the analysis since the MRFSS is not conducted in Texas. Therefore, only activity in the remaining Gulf states (Alabama, Florida, Louisiana, and Mississippi) is included. Since the grouper fishery is primarily prosecuted in the eastern Gulf, the omission of Texas activity should not significantly affect the results.

The analytical approach considers the reduction in keep of red grouper and other species in the aggregate grouper bag limit (see Table 6.3.5) that would have occurred if the proposed action were in place during 2003 and 2004. Annual data for 2005 is not currently available. Harvest activity for these years shows that red grouper landings in 2004 were relatively large whereas landings in 2003 were relatively low. Therefore, the range of effects of the alternatives in these two years should reasonably bound the possible effects of the policies if implemented in 2006. This range may also accommodate any under- or over-estimation of impacts that results from the exclusion of the headboat and Texas sectors from the analysis.

The analysis evaluated four types of policies: individual angler daily red grouper bag limits; vessel daily red grouper bag limits; individual angler daily aggregate grouper bag limits; and grouper fishery closures. The analysis assumed that the changes in value from these policies are manifest in changes in the number of fish kept, rather than in fish caught or the number of trips taken. Furthermore, the effects are valued in terms of changes in fish kept from the GOM reef fish complex by anglers who targeted these species. This sub-population of anglers, as opposed to just anglers who targeted red grouper or species in the aggregate grouper bag, was selected to be consistent with the stratification of economic value results contained in the most recent economic analysis of marine recreational fishing in the Southeastern U.S. (Haab et al., 2001). Economic value estimates are not available for individual reef fish species, nor are they available

by species group by mode fished. Since those who catch the species in question and not just those who target the species will also be affected by the proposed regulations, the focus on target effort (trips) as opposed to catch effort (trips) may result in an underestimation of impacts. For the grouper species, catch effort was approximately 3.5 times that of target effort from 2000-2004. However, to the extent that the angler who does not express target intent for grouper fishes opportunistically, i.e., is satisfied with whatever is caught, the appropriate consumer surplus loss associated with reduced grouper harvests would be expected to be less than for targeting individuals. Thus, while the estimates of affected effort may underestimate the true impact, the estimate of consumer surplus per fish is likely an overestimate. The net effect of this under- and overestimation cannot be determined.

Since the evaluation focused on changes in fish landed, the implicit assumption was that effort patterns would not change, trips would not be reduced, business flow to the for-hire industry would not change, and expenditures to associated industries would not be reduced. In reality, some individual behavior changes would be expected, such as fishing for other species or cancellation of fishing trips. Substituting other species for grouper would reduce the economic losses associated with reduction in grouper landings, whereas canceled trips would result in additional economic losses not captured in the current analysis. However, current data are insufficient to capture these behavioral responses. It is, therefore, unknown what the net effect of any behavioral responses would be.

The economic values per fish were applied to the reductions in landings expected with each alternative. The approach used to estimate landings reduction for this analysis followed the methods used in Strelcheck (2005 b and d) and Brooks (2003, 2004) to calculate expected landings changes with MRFSS data. Specifically, each MRFSS intercept trip in 2003 and 2004 was subjected to the alternative policies and the change in expected keep was recorded for red grouper, the aggregate grouper bag, and the reef fish complex.

The analysis produced estimates of the number of trips affected by the proposed measures, the combined reduction in fish kept, and the reduction in consumer surplus associated with the reduction in fish kept. The quantification of effort impacts incorporated consideration of multiple contributors and party size. Therefore, the estimates of affected trips represent distinct individual angler “events” even though multiple anglers in the data may have been on the same intercepted vessel trip. Additionally, the assessment information provided in Tables 7.3.1-7.3.18 contains estimates of the number of trips (angler trips) affected by both the red grouper daily bag limit and aggregate grouper daily bag limit. Since red grouper harvest is included in the aggregate, an angler may be simultaneously impacted by both limits. The estimates provided, however, do not capture this occurrence and, hence, the separate totals cannot be combined as such would result in double counting.

The assumptions made in the analysis included:

- 1) The fishery in 2003 and 2004 accurately bound the fishery expected in 2006;
- 2) Effort does not change in response to policy changes;
- 3) Catch rates of reef fish species do not change as a result of the action rule or anglers do not value changes in catch rates (only changes in keep rates are valuable);
- 4) The value of a one fish decrease in keep is the same as the value of a one fish increase;

- 5) The value of all species included in the analysis is the same on average;
- 6) Charterboat anglers place the same value on these species as private boat anglers;
- 7) The value of incidental (non-targeted) keep of these species is unchanged by the action;
- 8) The proposed February 15 through March 15 closure was modeled assuming the entire months of February and March were closed; and
- 9) During the February through March closure, the analysis assumed closure for all grouper and not just red grouper, gag, and black grouper.

Due to these assumptions, it is important to note that the estimated effects are appropriate measures of relative changes rather than absolute changes in the recreational fishery. Thus, although estimates of the absolute changes in fishery performance will be discussed, the primary focus should be placed on the ranking of the results rather than their magnitude. Estimates of the impacts of the proposed alternatives are contained in Tables 7.3.1-7.3.18.

Further note is appropriate with regard to the impact assessment of the proposed February 15 through March 15 closure. The modeling assumption for this alternative, closing all of February and March, results in modeling a period twice as long as that actually proposed. Thus, it might be concluded that the resultant estimated impacts are twice real expectations. However, it should be recalled that the metric of effort utilized is target trips rather than catch trips, which again, are less than three times catch trips. Thus, doubling the period of analysis may not be significant given the potential variability of affected trips associated with the trip-type focus.

Most grouper trips do not land either the red grouper or aggregate grouper daily bag limit, as demonstrated by estimated percent reductions reported in Strelcheck (2005b and d). Thus, while the assumption that reducing the daily bag limit will not result in a change in effort is probably not true for all anglers, it is not unreasonable on average. Maintaining the same behavioral assumption for a closed season, however, is less reasonable, particularly for species like grouper that are popular table fare. Therefore, under a seasonal grouper closure, while alternative fishing opportunities remain, some trip cancellation may be expected. To gauge the potential impacts of trip cancellation, estimates of the potential foregone expenditures are provided. This information is derived from Holiman (2000), who reported that the average expenditure per trip for charterboat anglers in Florida was \$682 (\$821 in 2005\$), while the comparable figure for private/rental anglers was \$127 (\$153 in 2005\$). These estimates include, but are not limited to, expenditures on travel, lodging, food and beverage, gear, and charter or rental fees, where appropriate. The estimates also represent the average across multiple and single-day fishing trips. Additionally, expenditures on charterboat fees are examined, based on an average of \$103 (\$124 in 2005\$) per charter angler (Holiman, 2000). These expenditure estimates were combined with the estimates of affected trips provided by Carter (2005) to generate an estimate of the amount of potential foregone expenditures. These estimates are provided in Tables 7.3.19 and 7.3.20. The exclusion of the headboat and Texas sectors in this analysis results in an underestimation of the true potential foregone expenditures. However, the assumption that all affected trips will be cancelled overestimates the likely true effect since the opportunity to fish for other species still exists and many fishing trips are just one component of a multi-day vacation. The net effect of the dual under- and over-estimation from the various assumptions is unknown. However, the relative ranking of the alternatives should not be affected.

7.3.1.1 Alternative 1 (status quo/no action)

The assessment assumed that all daily bag limits are strictly followed. Since daily bag limits are exceeded on some trips, the assessment of **Alternative 1** indicates that landings reduction would result if there were complete compliance with existing limits. This landings reduction is estimated to range from approximately 38,000-70,000 fish, valued at \$140,000-\$276,000 in consumers surplus (Table 7.3.1). Strict adherence to the red grouper daily bag limit is estimated to impact approximately 3,600-26,000 trips.

Continued fishing under status quo (no action) regulations is expected to result in red grouper landings exceeding the recreational target catch level, 1.25 MP GW. While landings may not continue at 2004 levels, they are expected to remain at least as high as the 2003 landings of 1.35 MP GW. Continued overages have the potential to jeopardize the recovery of red grouper, requiring deviation from the rebuilding plan, more restrictive management measures, and delay in greater harvest allowances that would be possible as the stock is rebuilt. More restrictive management would be expected to result in reduced landings, reduced value per trip, and potentially reduced numbers of trips. A reduction in trips would result in a reduction in associated expenditures through the fishery and associated industries. This would reduce the overall current and future economic value of the fishery. Changes in fishing patterns may increase pressure on other stocks and may lead to additional adverse economic consequences should harvest of these stocks exceed allowable limits. These indirect impacts cannot be forecast at this time.

As a result of the recreational overages, the expected TAC increase projected under the red grouper rebuilding plan will not occur (NMFS 2004a). Specifically, under the rebuilding plan, the red grouper TAC for 2006-2008 was projected to increase from the current 6.56 mp to 7.23 mp. Under the current allocation ratio of 81 percent commercial and 19 percent recreational, the increased TAC would have equated to 567,000 more pounds for the commercial sector and 133,000 more pounds for the recreational sector per year. Since the recreational sector is not quota managed, they could harvest this additional TAC and more, regardless of whether the actual TAC is increased, as clearly demonstrated by the landings overages under current bag and size limits. The commercial sector, however, is subject to a hard quota, resulting in closure of the fishery when the quota is met. Thus, the loss of the projected increase of 567,000 pounds of red grouper represents a real loss to the commercial sector under the status quo (no action). The TAC increase would have represented almost an 11 percent increase in allowable harvest valued at, assuming \$2.50 per pound, approximately \$1.42 million per year for at least 2 years. Although the rebuilding plan projected this increase for 3 years, a new red grouper assessment is scheduled for 2006, raising the likelihood that adjustments can or will be made for the 2008 fishing year.

In summary, **Alternative 1** would be expected to result in continued recreational red grouper landings overages, leading to deviation from the red grouper rebuilding plan, more restrictive management, and delay of future increased benefits expected to accrue to rebuilt stocks. As a result of deviation from allowable harvest paths, expected TAC increases for the 2006-2008 fishing years will not occur, resulting in the commercial sector not experiencing an approximate 11 percent increase in quota, valued at approximately \$1.42 million.

7.3.1.2 Alternative 2

Alternative 2 is expected to reduce recreational red grouper landings by approximately 61,000-158,000 fish, valued at \$234,000-\$639,000 in consumer surplus (Table 7.3.1). These results are approximately \$95,000-\$364,000 more than **Alternative 1** (status quo/no action) (Table 7.3.4) and approximately \$41,000-\$272,000 less than the **Preferred Alternative 5** (Table 7.3.7). However, it should be noted that the estimated impacts of **Preferred Alternative 5** may be overestimated due to the modeling assumptions (see Section 7.3.2.5). The reduced red grouper daily bag limit is expected to affect approximately 18,000-31,000 more trips than **Alternative 1** (status quo/no action) for the individual limit and 10,000-55,000 more trips than **Alternative 1** (status quo/no action) for the vessel limit, and approximately 9,000-31,000 fewer trips than **Preferred Alternative 5** for the individual limit and 10,000-55,000 more trips for the vessel limit. Thus, the quantifiable short-term adverse economic impacts of **Alternative 2** would be greater than those of **Alternative 1** (status quo/no action), though the unquantified long term adverse impacts associated with deviation from the recovery path under the status quo (no action) are expected to exceed the short term losses associated with **Alternative 2**, but less than those (except with regards to affected trips) of the **Preferred Alternative 5**. The additional protection to related species afforded by **Preferred Alternative 5** are, however, expected to result in unquantified benefits to both red grouper, through the reduction of bycatch mortality, and other grouper species.

The sector impacts of **Alternative 2** on affected trips, fish kept and reduction in consumer surplus are presented in Tables 7.3.2-7.3.3 (total impacts), Tables 7.3.5-7.3.6 (difference from the status quo/no action), and Tables 7.3.8-7.3.9 (difference from the **Preferred Alternative 5**). Approximately 52-64 percent of the impacts would be borne by the private/rental angler sector. Tables 7.3.19-7.3.20 contain estimates of the potential foregone expenditures and for-hire fees associated with proposed closures. **Alternative 2** does not contain a closure, while **Preferred Alternative 5** proposes a February 15 through March 15 closure. Since the analysis cannot predict trip cancellation due to daily bag limit reductions, no trip cancellation is assumed or projected under **Alternative 2**. Thus, by assumption, both the short term potential of trip cancellation and the reduction of associated expenditures and accompanying economic activity are greater for the **Preferred Alternative 5** than **Alternative 2**.

7.3.1.3 Alternative 3

Alternative 3 is expected to reduce landings by approximately 79,000-170,000 fish, valued at \$278,000-\$661,000 in consumer surplus (Table 7.3.1). These results are approximately \$138,000-\$386,000 more than **Alternative 1** (status quo/no action) (Table 7.3.4) and approximately \$19,000-\$228,000 less than the **Preferred Alternative 5** (Table 7.3.7). However, as previously noted, the estimated impacts of **Preferred Alternative 5** may be overestimated due to the modeling assumptions (see Section 7.3.2.5). The increased red grouper minimum size limit is expected to affect approximately 77,000-142,000 more trips than both **Alternative 1** (status quo/no action) and the **Preferred Alternative 5** since neither contain a size limit change. Thus, the quantifiable short-term adverse economic impacts of **Alternative 2** would be greater than those of **Alternative 1** (status quo/no action) and those of the **Preferred Alternative 5**.

The additional protection to related species afforded by the **Preferred Alternative 5** are, however, expected to result in unquantified benefits to both red grouper, through the reduction of bycatch mortality, and the other grouper species due to reduced landings of these species, some of which are subject to substantial harvest pressure, notably gag.

The sector impacts of **Alternative 3** on affected trips, fish kept and reduction in consumer surplus are presented in Tables 7.3.2-7.3.3 (total impacts), Tables 7.3.5-7.3.6 (difference from the status quo/no action), and Tables 7.3.8-7.3.9 (difference from the **Preferred Alternative 5**). Approximately 63-66 percent of the impacts would be borne by the private/rental angler sector. Tables 7.3.19-7.3.20 contain estimates of the potential foregone expenditures and for-hire fees associated with proposed closures. **Alternative 3** does not contain a closure. Since the analysis cannot predict trip cancellation due to size limit increases, no trip cancellation is assumed or projected under **Alternative 3**. Thus, by assumption, both the short term potential of trip cancellation and the reduction of associated expenditures and accompanying economic activity are greater for the **Preferred Alternative 5** than **Alternative 3**.

7.3.1.4 Alternative 4

In addition to a red grouper daily bag limit reduction, **Alternative 4** contains two closure alternatives, either an August closure (**Alternative 4A**) or a February 15 through March 15 closure (**Alternative 4B**). **Alternative 4A** is expected to reduce recreational red grouper landings by approximately 103,000-302,000 fish, valued at \$398,000-\$1.22 million in consumer surplus (7.3.6). These results are approximately \$259,000-\$947,000 more than **Alternative 1** (status quo/no action) (Table 7.3.4) and approximately \$108,000 less to \$542,000 more than the **Preferred Alternative 5** (Table 7.3.7). The reduced red grouper daily bag limit is expected to affect approximately 27,000-62,000 more trips than **Alternative 1** (status quo/no action) and the same number of trips as the **Preferred Alternative 5**. In addition to the lower red grouper daily bag limit, the closed season is expected to affect 324,000-435,000 more trips than **Alternative 1** and 159,000-251,000 more trips than **Preferred Alternative 5**. Although all affected trips are not expected to be cancelled, since fishing for alternative species would still be possible, if all affected trips were cancelled during the closed month, foregone expenditures associated with these trips would range from \$97.11 million to \$105.40 million (Table 7.3.19), or an average of \$101.25 million in potential foregone expenditures. This is over twice the estimated average expected potential foregone expenditures of the **Preferred Alternative 5** (\$40.30 million). Potential foregone for-hire fees are estimated at approximately \$8.01 million, compared to approximately \$2.52 million for the **Preferred Alternative 5** (Table 7.3.20). Thus, the quantifiable short-term adverse economic impacts of **Alternative 4A** would be greater than those of **Alternative 1** (status quo/no action) and greater than those of the **Preferred Alternative 5**.

The sector impacts of **Alternative 4A** on affected trips, fish kept and reduction in consumer surplus are presented in Tables 7.3.2-7.3.4 (total impacts), Tables 7.3.5-7.3.6 (difference from the status quo/no action), and Tables 7.3.8-7.3.9 (difference from the **Preferred Alternative 5**). Approximately 74-84 percent of the impacts of **Alternative 4A** would be borne by the private/rental angler sector.

Alternative 4B is expected to reduce recreational red grouper landings by approximately

201,000-351,000 fish, valued at \$746,000-\$1.39 million in consumer surplus (Table 7.3.1). These results are approximately \$606,000-\$1.11 million more than **Alternative 1** (status quo/no action) (Table 7.3.4) and approximately \$239,000-\$708,000 more than the **Preferred Alternative 5** (Table 7.3.7). The reduced red grouper daily bag limit is expected to affect approximately 27,000-62,000 more trips than **Alternative 1** (status quo/no action) and the same number of trips as the **Preferred Alternative 5**. In addition to the lower red grouper daily bag limit, the closed season is expected to affect 165,000-184,000 more trips than **Alternative 1** and 304,000-470,000 more trips than **Preferred Alternative 5**. Although all affected trips are not expected to be cancelled, since fishing for alternative species would still be possible, if all affected trips were cancelled during the closed month, foregone expenditures associated with these trips would range from \$172.11 million to \$211.53 million (Table 7.2.19), or an average of \$191.82 million in potential foregone expenditures. This is almost five times the estimated average expected potential foregone expenditures of the **Preferred Alternative 5** (\$40.30 million). Potential foregone for-hire fees are estimated at approximately \$19.66 million, compared to approximately \$2.52 million for the **Preferred Alternative 5** (Table 7.3.20). Thus, the quantifiable short-term adverse economic impacts of **Alternative 4B** would be greater than those of **Alternative 1** (status quo/no action) and greater than those of the **Preferred Alternative 5**. Approximately 46-55 percent of the impacts of **Alternative 4B** would be borne by the private/rental angler sector.

7.3.1.5 Preferred Alternative 5

In addition to a red grouper daily bag limit reduction, **Preferred Alternative 5** also contains a February 15 through March 15 closure. **Preferred Alternative 5** is expected to reduce recreational red grouper landings by approximately 128,000-168,000 fish, valued at \$506,000-\$680,000 in consumer surplus (Table 7.3.1). These results are approximately \$366,000-\$405,000 more than **Alternative 1** (status quo/no action) (Table 7.3.4). The reduced red grouper daily bag limit is expected to affect approximately 27,000-62,000 more trips than **Alternative 1** (status quo/no action). In addition to the lower red grouper daily bag limit, the closed season is expected to affect 165,000-184,000 more trips than **Alternative 1**. If all affected trips were cancelled during the closed month, foregone expenditures associated with these trips would range from \$38.33 million to \$42.47 million (Table 7.2.19), or an average of \$40.30 million in potential foregone expenditures. However, all affected trips are not expected to be cancelled since fishing for alternative species would still be possible. Potential foregone for-hire fees are estimated at approximately \$2.52 million (Table 7.3.20). Approximately 66-72 percent of the consumer surplus impacts of **Preferred Alternative 5** would be borne by the private/rental angler sector. The unquantified long-term adverse impacts associated with deviation from the recovery path under **Alternative 1** (status quo/no action), however, are expected to exceed the short term losses associated with the **Preferred Alternative 5**.

The analysis, however, is expected to overestimate the potential impacts of this alternative because of the various assumptions adopted in the modeling routine. The analysis applied the closure to all grouper species instead of just red grouper, gag, and black grouper, and applies the closure to the entire months of February and March rather than the actual proposed February 15 through March 15 closure. The broader application of the closure was adopted to address analytical complications and in acknowledgement that most, though not all, harvest of these

other grouper species is likely bycatch while targeting red grouper, gag, and black grouper, such that if the fishery for these three species is closed, little effort will be applied for the remaining grouper species. Since these three species comprise the majority of grouper landings, expansion of the analysis to include all grouper likely has little impact. Doubling the closure period, however, probably has the greater effect. If fishing patterns are uniform over the entire February through March period, a simple conclusion would be that doubling the closure period over that actually proposed would double the estimate of trips affected by the closure. However, since the proposed closure was selected to coincide roughly with the peak spawning season, it is reasonable to assume that effort may be greater during these thirty days such that doubling the closure period would not result in a straight doubling of the estimate of affected trips. The caveats associated with modeling target effort, as opposed to catch effort, as discussed in Section 7.3.1 should be recalled also. While it is not possible to definitively determine the net impacts of the potential over-and under-estimation of the various modeling assumptions, it is, nevertheless, concluded that the estimates of affected trips and reduction in landings and value overestimate the true impacts by an unknown degree due to the persistence of fishing urges and the flexibility of anglers to adapt to other species and/or fishing periods.

7.3.1.6 Alternative 6

Alternative 6 is expected to reduce landings by approximately 77,000-163,000 fish, valued at \$278,000-\$642,000 in consumer surplus (Table 7.3.1). These results are approximately \$138,000-\$366,000 more than **Alternative 1** (status quo/no action) (Table 7.3.4) and approximately \$38,000-\$229,000 less than the **Preferred Alternative 5** (Table 7.3.7). The increased red grouper minimum size limit is expected to affect approximately 52,000-87,000 more trips than both **Alternative 1** (status quo/no action) and the **Preferred Alternative 5** since neither contain a size limit change. Thus, the quantifiable short-term adverse economic impacts of **Alternative 2** would be greater than those of **Alternative 1** (status quo/no action), but less than those of the **Preferred Alternative 5**. The additional protection to related species afforded by the **Preferred Alternative 5** are, however, expected to result in unquantified benefits to both red grouper, through the reduction of bycatch mortality, and the other grouper species due to reduced landings of these species, some of which are subject to substantial harvest pressure, notably gag.

Approximately 63-71 percent of the impacts of **Alternative 6** would be borne by the private/rental angler sector. **Alternative 6** does not contain a closure. Since the analysis cannot predict trip cancellation due to daily bag limit or size limit changes, no trip cancellation is assumed or projected under **Alternative 6**. Thus, by assumption, both the short term potential of trip cancellation and the reduction of associated expenditures and accompanying economic activity are greater for the **Preferred Alternative 5** than **Alternative 6**.

7.3.1.7 Alternative 7

Alternative 7 is expected to reduce recreational red grouper landings by approximately 63,000-164,000 fish, valued at \$240,000-\$664,000 in consumer surplus (17.3.6). These results are approximately \$100,000-\$388,000 more than **Alternative 1** (status quo/no action) (Table 7.3.4) and approximately \$17,000-\$266,000 less than the **Preferred Alternative 5** (Table 7.3.7). The

reduced red grouper daily bag limit is expected to affect approximately 18,000-31,000 fewer trips than both **Alternative 1** (status quo/no action) and **Preferred Alternative 5** for the individual limit and 13,000-65,000 more trips for the vessel limit. The total number of anglers affected by either the individual limit or vessel limit is greater for **Alternative 7**, however, than under the **Preferred Alternative 5**. Thus, the quantifiable short-term adverse economic impacts of **Alternative 7** would be greater than those of **Alternative 1** (status quo/no action) and the **Preferred Alternative 5**. The additional protection to related species afforded by the closure provision of the **Preferred Alternative 5** are expected to result in additional unquantified benefits to both red grouper, through the reduction of bycatch mortality, and the other grouper species relative to **Alternative 7**.

Approximately 49-60 percent of the impacts of **Alternative 7** would be borne by the private/rental angler sector. **Alternative 7** does not contain a closure. Since the analysis cannot predict trip cancellation due to daily bag limit changes, no trip cancellation is assumed or projected under **Alternative 7**. Thus, by assumption, both the short term potential of trip cancellation and the reduction of associated expenditures and accompanying economic activity are greater for the **Preferred Alternative 5** than **Alternative 7**.

7.3.2 Action 2: For-hire Captain and Crew Daily Bag Limit

7.3.2.1 Alternative 1 (status quo/no action)

Under status quo (no action) conditions, all captain and crew could retain daily bag limits equal to that of all other recreational anglers. Although the amount of landings attributable to captain and crew is unknown and cannot be determined with current recreational data collection systems, the status quo (no action) would allow all customary and usual harvest activities by captain and crew to continue unchanged. In concept, since it is not legal to sell recreationally caught reef fish, the only economic impact of allowing or disallowing captain and crew harvest is if for-hire customers are allowed to keep the captain and crew limits (daily bag limits are enforced on a vessel basis; if not all persons on the vessel fish, then those who do can functionally exceed the individual limits) and this is either factored into the price of the for-hire service or the customers decision to take a trip. Given the highly competitive nature of the industry, it is not expected, on average that the price of service reflects a premium for allowing passengers to keep the captain and crew limits. Further, since most anglers do not currently land the daily bag limits, it is illogical to conclude that the ability to land more than the individual bag is a significant factor in determining whether or with what frequency for-hire trips are taken.

Since the status quo (no action) would allow all current behavior to continue, no direct adverse economic impacts would accrue. However, in combination with the selection of the status quo/no action alternatives for **Action 1** and **Action 3**, the status quo (no action) would result in continued recreational landings that exceed the rebuilding plan, resulting in the adverse economic impacts discussed in Section 7.3.2. Additionally, the status quo (no action) has the potential to induce unquantifiable indirect adverse economic impacts if adopted in conjunction with any alternative that reduces the individual daily bag limit (**Action 1, Alternatives 2 and 4-7**). Currently, the daily bag limits are not binding for most anglers. Thus, the opportunity to

exceed the individual limits, though it exists, is not significant relative to most trips. However, as the individual daily bag limit is reduced, the limit becomes binding on more trips, thus increasing the opportunity to want to harvest more fish. Continuing to allow captain and crew increases the potential harvest by the recreational anglers, thereby decreasing the ability to meet the necessary landings reductions. Failure to meet reduction targets would increase the need and likelihood of more severe future reductions through additional management action, (lower daily bag limits, longer closed seasons, higher minimum size limits) with resultant increased adverse economic impacts (increased reductions in consumer surplus, more trip cancellations, increased foregone expenditures). The actual magnitude of these impacts cannot be determined at this time.

7.3.2.2 Preferred Alternative 2

Since recreational reef fish landings cannot be sold, and captain and crew landings are not believed to be a factor in determining either the cost of the for-hire service or the demand for for-hire trips, **Preferred Alternative 2** is not expected to have any direct adverse economic impacts on the for-hire sector. Although it is reported that some captains and crew actually fish while they provide for-hire services, the amount of actual landings attributable to this activity is unknown and cannot be determined with current recreational data collection systems. In concept, this activity results in both pleasure and enjoyment (recreational value or consumer surplus) to the individuals, and provides food for themselves and families. **Preferred Alternative 2** would, therefore, result in a direct loss of this recreational value and require expenditures for substitute foods. Since neither the incidence nor magnitude of captain and crew landings can be determined, neither of these impacts can be quantified.

Preferred Alternative 2 would, however, increase the likelihood that the landings reduction targets are reached, supporting return to the specified rebuilding path for red grouper and reducing the need for more severe reductions with accompanying increased adverse economic impacts.

7.3.3 Action 3: Aggregate Grouper Daily Bag Limit

7.3.3.1 Preferred Alternative 1 (status quo/no action)

Since **Preferred Alternative 1** would allow current aggregate daily bag limits to be maintained, no direct adverse economic impacts would occur. All current fishing behavior could continue unchanged, with no reduction in consumer surplus, and no expected reduction in trip demand, expenditures, etc. Maintaining the aggregate limit would allow some mitigation of the impacts of the red grouper restrictions through the substitution of other grouper species. Such mitigation, however, would increase the incentive to continue fishing for other grouper once the red grouper limit is reached. Since red grouper, in general (regional distribution differences are acknowledged), share common habitat with the other grouper species, continued fishing for the other grouper species increases the likelihood for increased bycatch and release mortality of red grouper. Although the mortality rate of released red grouper is believed to be low, this additional mortality could reduce the effectiveness of the landings reductions accomplished by **Actions 1 and 2** and jeopardize the rebuilding schedule, resulting in more severe restrictions, delayed

recovery, and accompanying adverse economic impacts. At some point the protection of these other species may be more than is necessary and the potential for foregone benefits exists; however, that point cannot be quantitatively identified. The Council felt that the reductions specified by **Alternative 2, 3, or 4** are significant, excessive and would likely result in substantial foregone economic benefits when combined with the reductions from Action 1; Preferred Alternative 5.

7.3.3.2 Alternative 2

Alternative 2 is expected to reduce landings by approximately 53,000-105,000 fish, valued at \$199,000-\$420,000 in consumer surplus (Table 7.3.10). Approximately 35-60 percent of the impacts would be borne by the private/rental angler sector. These results are approximately 14,000-35,000 more fish, valued at \$59,000-\$145,000, than **Preferred Alternative 1** (status quo/no action) (Table 7.3.13) and approximately 26,000-56,000 fewer fish, valued at \$107,000-\$230,000, than the **Alternative 3** (Table 7.3.16). The reduced aggregate grouper daily bag limit is expected to affect approximately 8,600-21,000 more trips than **Alternative 1**, and approximately 15,000-26,000 fewer trips than the **Alternative 3**.

The reduction in the aggregate daily bag limit on top of the reduction in the red grouper daily bag limit may provide some protection to other grouper species from redirected red grouper effort, as well as reduce bycatch and subsequent mortality of red grouper, assuming anglers cease fishing upon reaching the limit. The economic impacts of this cannot be assessed since it cannot be forecast how much redirection might otherwise occur and what impact this may have on these species. The reduction in the aggregate daily bag limit should not eliminate the mitigation benefits of all substitution, but could prevent excessive new pressure on substitute species. Avoidance of excessive pressure on these alternative species and the additional management measures that might otherwise be required would eliminate any reduction of benefits that would accrue to these fisheries.

7.3.3.3 Alternative 3

Alternative 3 is expected to reduce landings by approximately 78,000-161,000 fish, valued at \$199,000-\$420,000 in consumer surplus (07.3.15). Approximately 36-54 percent of the impacts would be borne by the private/rental angler sector. These results are approximately 40,000-91,000 more fish, valued at \$166,000-\$375,000, than **Preferred Alternative 1** (status quo/no action) (Table 7.3.13). The reduced aggregate grouper daily bag limit is expected to affect approximately 24,600-47,000 more trips than **Preferred Alternative 1**.

The reduction in the aggregate daily bag limit on top of the reduction in the red grouper daily bag limit may provide some protection to other grouper species from redirected red grouper effort, as well as reduce bycatch and subsequent mortality of red grouper, assuming anglers cease fishing upon reaching the limit. The economic impacts of this cannot be assessed since it cannot be forecast how much redirection might otherwise occur and what impact this may have on these species. The reduction in the aggregate daily bag limit should not eliminate the mitigation benefits of all substitution, but could prevent excessive new pressure on substitute species. Excessive new pressure on these species would be expected to require even more restrictive

management of these species, with accompanying adverse economic impacts. Avoidance of excessive pressure on these alternative species and the additional management measures that might otherwise be required would eliminate the need to impose these more restrictive management measures, thus avoiding any subsequent reduction of benefits from these fisheries.

Since the reduction in the aggregate limit is greater for **Alternative 3** than **Alternative 2**, the potential protection for both red grouper and the other grouper species is greater. However, the greater the reduction, the more anglers are limited in substituting other grouper species and the opportunity for mitigating the impacts of the reduced red grouper daily bag limit is reduced. Further, at some point, the protection of these other species may be greater than is necessary, given natural availability and ability or tendency to catch these species (a stock may be able to biologically support a 4-fish limit, yet be subjected to a 3-fish limit). Thus, foregone benefits may be incurred. The point at which this becomes the case, however, has not been determined and the net impact of these potentialities cannot be quantified.

7.3.3.4 Alternative 4

Alternative 4 is expected to reduce landings by approximately 141,000-256,000 fish, valued at \$566,000-\$1.04 million in consumer surplus (Table 7.3.10). Approximately 47-52 percent of the impacts would be borne by the private/rental angler sector. These results are approximately 103,000-185,000 more fish, valued at \$426,000-\$766,000, than **Preferred Alternative 1** (status quo/no action) (Table 7.3.13) and approximately 63,000-95,000 more fish, valued at \$260,000-\$391,000, than **Alternative 3** (Table 7.3.16). The reduced aggregate grouper daily bag limit is expected to affect approximately 71,000-92,000 more trips than **Alternative 1**, and approximately 47,000-45,000 more trips than **Alternative 3**.

The reduction in the aggregate daily bag limit on top of the reduction in the red grouper daily bag limit may provide some protection to other grouper species from redirected red grouper effort, as well as reduce bycatch and subsequent mortality of red grouper, assuming anglers cease fishing upon reaching the limit. The economic impacts of this cannot be assessed since it cannot be forecast how much redirection might otherwise occur and what impact this may have on these species. The reduction in the aggregate daily bag limit should not eliminate the mitigation benefits of all substitution, but could prevent excessive new pressure on substitute species. Excessive new pressure on these species would be expected to require even more restrictive management of these species, with accompanying adverse economic impacts. Avoidance of excessive pressure on these alternative species and the additional management measures that might otherwise be required would eliminate the need to impose these more restrictive management measures, thus avoiding any subsequent reduction of benefits from these fisheries.

Since the reduction in the aggregate limit is greater for **Alternative 4**, the potential protection for both red grouper and the other grouper species is greater. However, the greater the reduction, the more anglers are limited in substituting other grouper species and the opportunity for mitigating the impacts of the reduced red grouper daily bag limit is reduced. Further, at some point, the protection of these other species may be greater than is necessary, given natural availability and ability or tendency to catch these species (a stock may be able to biologically support a 3- or 4-fish limit, yet be subjected to a 2-fish limit). Thus, foregone benefits may be incurred. The point

at which this becomes the case, however, has not been determined and the net impact of these potentialities cannot be quantified.

7.4 Direct and Indirect Effects on the Social Environment

7.4.1 Action 1: Red Grouper Landings Limits

7.4.1.1 Alternative 1 (status quo/no action)

Under **Alternative 1 (status quo/no action)**, no immediate changes would occur in the fishery and, therefore, all business and social patterns could continue unchanged in the short term. However, continued fishing under the status quo (no action) is expected to result in red grouper landings exceeding the recreational target catch level. Continued overages jeopardize the recovery of red grouper, precipitating deviation from the rebuilding plan, more restrictive management measures, and delay in more liberal landing allowances that would be possible as the stock is rebuilt. This would be expected to result in reduced landings, reduced value per trip, and potentially reduced trips. Reduced trips would result in reduced expenditures flowing through the fishery and associated industries. The impacts of these reduced expenditures would be expected to be felt by both directly associated industries, such as marinas, bait and tackle shops, and food suppliers and lodging, as well as other businesses in the community that employees in the directly associated industries patronize. The overall reduction in the current and future economic value of the fishery would, therefore, be expected to induce adverse impacts throughout the communities where the fisheries occur.

The ability to adapt to the diminished economic environment created by the reduction in the value of the fishery is influenced by the diversity of fishing and other employment alternatives. Fisheries are heavily regulated and the flexibility to shift from one to another is increasingly limited. Further, often the communities associated with the fishery lack sufficient diversity to offer substitute employment opportunities. This increases the severity of the adverse social impacts that would be expected to ensue.

7.4.1.2 Alternative 2

Alternative 2 is expected to reduce the magnitude of the landings overages expected to occur under **Alternative 1 (status quo/no action)**, thus inducing immediate landings reductions, with associated reductions in angler value, yet reducing the severity of corrective action that would be required should landings overages be allowed to continue unabated for a longer period of time. Therefore, the severity of the social impacts that would be expected in the longer term under the status quo (**Alternative 1**) would be reduced.

Although this alternative is expected to result in reduced value or pleasure associated with the fishing experience, no changes in fishing behavior are expected. Thus, expenditure patterns through the fishery and associated industries are expected to continue largely unchanged. Therefore, employment patterns, income and expenditure flow, lifestyle patterns, community interactions, etc. should remain largely unaffected.

7.4.1.3 Alternative 3

The expected social impacts of **Alternative 3** are similar to those of **Alternative 2** and are included herein by reference. However, the additional mortality associated with the increased release may substantially reduce the progress towards returning the fishery to the rebuilding plan. Thus, avoidance of more severe corrective action and accompanying adverse social impacts may be reduced. Additionally, minimum size limits are increasingly viewed with skepticism by the angling public, particularly for species subject to high release rates and release mortality due to the depths at which they are hooked and the difficulties associated with their air bladder and subsequent return to the bottom. Thus, increasing the minimum size could precipitate substantial negative response from the fishery and conservation sectors, resulting in protracted management deliberation, non-compliance, and legal challenges.

7.4.1.4 Alternative 4

With regards to the daily bag limit impacts, the expected social impacts of **Alternative 4** are identical to those of **Alternative 2** and are included herein by reference. Unlike reduced daily bag limits, however, **Alternative 4** increases the possibility of behavioral changes by anglers. Specifically, while it is assumed that the red grouper daily bag limit reduction will not induce fishing trip cancellation, closures increase the probability that anglers will select alternative recreational activities and cancel their fishing trip. As stated above, the potential foregone expenditures as a result of cancelled trips could be in excess of \$200 million. The loss of these expenditures may jeopardize the business viability of many enterprises and associated industries, creating stress in both business and social relationships and additional burdens on social structures and support services. The potential severity of the impacts may induce the perception of excessive and irresponsible management. This may precipitate additional adverse social and economic behaviors such as refusal to cooperate with the management process and legal challenge.

7.4.1.5 Preferred Alternative 5

The social impacts of the daily bag limit reductions and closures for **Preferred Alternative 5** are similar to those of **Alternative 4** and are included herein by reference. The impacts are tempered, however, since the closure option included in **Preferred Alternative 5** is projected to result in the lowest potential foregone expenditures and, thus, should induce the least adverse social impacts of trip cancellation. Additionally, the closure proposed in **Preferred Alternative 5** would occur during the spawning seasons for gag, black grouper, and red grouper, and therefore could be perceived by anglers to have additional biological benefits.

7.4.1.6 Alternative 6

The expected social impacts the daily bag limit reduction contained in **Alternative 6** are identical to those of **Alternative 2** and are incorporated herein by reference, while the expected social impacts of the minimum size limit increase are similar to those of **Alternative 3**, though reduced due to the smaller increase in minimum size, and are, similarly, incorporated herein by reference.

7.4.1.7 Alternative 7

The expected social impacts of **Alternative 7** are identical to those of **Alternative 2**, though reduced since the daily bag limit reduction is slightly less severe under **Alternative 7**, and are incorporated herein by reference.

7.4.2 Action 2: For-Hire Captain and Crew Daily Bag Limit

7.4.2.1 Alternative 1 (status quo/no action)

Under **Alternative 1 (status quo/no action)**, no immediate changes would occur in the fishery and, therefore, all business and social patterns could continue unchanged in the short term. However, continued fishing under the status quo (no action) is expected to result in red grouper landings exceeding the recreational target catch level. Adoption of the status quo for this action in combination with reductions under **Action 1** or **Action 3** could reduce the expected landings reductions attributable to these actions. Continued overages have the potential to jeopardize the recovery of red grouper, precipitating deviation from the rebuilding plan, more restrictive management measures, and delay in more liberal landing allowances that would be possible as the stock is rebuilt. This would be expected to result in reduced landings, reduced value per trip, and potentially reduced trips. Reduced trips would result in reduced expenditures flowing through the fishery and associated industries. The impacts of these reduced expenditures would be expected to be felt in both directly associated industries, such as marinas, bait and tackle shops, and food suppliers and lodging, as well as other businesses in the community that employees in the directly associated industries patronize. The overall reduction in the current and future economic value of the fishery would, therefore, be expected to induce adverse impacts throughout the communities where the fisheries occur.

The ability to adapt to the diminished economic environment created by the reduction in the value of the fishery is influenced by the diversity of fishing and other employment alternatives. Fisheries are heavily regulated and the flexibility to shift from one to another is increasingly limited. Further, often the communities associated with the fishery lack sufficient diversity to offer substitute employment opportunities. This increases the severity of the adverse social impacts that would be expected to ensue.

Alternative 1 would also allow captains and crew to continue to benefit from the enjoyment of fishing and supplying their families with fresh fish.

7.4.2.2 Preferred Alternative 2

Preferred Alternative 2 is expected to increase the likelihood that landing reduction targets are met and could result in some small unquantifiable additional reductions in landings. Thus, while immediate landing reductions will occur, with associated reductions in angler value, the severity of additional corrective action that would be required should landings overages be allowed to continue unabated for a longer period of time would be reduced. Therefore, the severity of the social impacts that would be expected in the longer term under **Alternative 1** (status quo/no

action) would be reduced.

Although this alternative is expected to result in reduced value or pleasure associated with the fishing experience, no changes in fishing behavior is expected. Thus, expenditure patterns through the fishery and associated industries are expected to continue largely unchanged. Therefore, employment patterns, income and expenditure flow, lifestyle patterns, community interactions, etc. should remain largely unaffected.

Preferred Alternative 2 will, however, eliminate the benefits that captains and crew receive from actually fishing themselves while operating a for-hire trip and the benefits of taking fresh fish home from these trips. Since the cost of acquiring these fish is largely paid for by the for-hire paying passengers, this source of food is basically free. Having to replace this food with other sources would increase their food expenditure needs by an indeterminate amount, with an unknown effect on the overall family budget. If these fish are a significant source of family nutrition, their elimination could force employment patterns within the family to change, with unknown consequences.

7.4.3 Action 3: Aggregate Grouper Daily Bag Limit

7.4.3.1 Preferred Alternative 1

Under **Preferred Alternative 1** (status quo/no action), no immediate changes would occur in the fishery and, therefore, all business and social patterns could continue unchanged in the short term. However, status quo management of the aggregate grouper fishery in conjunction with more restrictive red grouper management could allow both increased mortality of red grouper as bycatch and result in increased pressure on other aggregate grouper species if anglers shift target behavior. This has the potential of more restrictive management measures in the future on both the red grouper and aggregate grouper fisheries. This would be expected to result in reduced landings, reduced value per trip, and potentially reduced trips and associated expenditures through the fishery and associated industries. Resultant impacts would be expected to be felt in both directly associated industries, such as marinas, bait and tackle shops, and food suppliers and lodging, as well as other businesses in the community that employees in the directly associated industries patronize. The overall reduction in the current and future economic value of the fishery would, therefore, be expected to induce adverse social impacts throughout the communities where the fisheries occur.

At some point the protection of these other aggregate grouper species may be more than is necessary and the potential for short-term negative social effects exist; however, that point can not be quantitatively identified. The Council felt that the reductions specified by **Alternative 2, 3, or 4** are significant and likely excessive when combined with the reductions from Action 1; Preferred Alternative 5 which closes February 15 to March 15 to gag and black grouper as well as red grouper and reduces harvest of gag and black by seven percent. The Council expects that Preferred Alternative 5 in Action 1 will be sufficient to compensate for any increase in harvest of gag or black grouper during the remaining open season and for any increase in red grouper discards due to the one red grouper bag limit.

7.4.3.2 Alternative 2

Alternative 2 is expected to reduce the potential of increased red grouper bycatch mortality and pressure on other grouper species, thereby reducing the severity of future corrective action. Therefore, the severity of the social impacts that would be expected in the longer term under the more severe corrective action that would be expected under the status quo (no action) would be reduced.

Although this alternative is expected to result in reduced value or pleasure associated with the fishing experience, changes in fishing behavior are expected to be small since relatively few trips currently harvest the proposed limit. Thus, expenditure patterns through the fishery and associated industries are expected to remain unchanged or would only be slightly reduced. This would be expected to have little effect on employment patterns, income and expenditure flow, lifestyle patterns, and community interactions.

7.4.3.3 Alternative 3

Preferred Alternative 3 is expected to result in similar impacts as described for Alternative 2. These impacts are incorporated herein by reference. The aggregate daily bag limit under this alternative represents a 40 percent reduction from **Preferred Alternative 1**. However, the aggregate grouper landings reduction under the lower limit is expected to be approximately 15 percent, so most trips would not be impacted by the reduction. Nevertheless, some portion of those anglers who routinely take the current limit may decide to change their fishing patterns as a result of the proposed reduction. The magnitude and resultant social impacts of this behavior, however, cannot be determined at this time.

7.4.3.4 Alternative 4

Alternative 4 is expected to result in the similar impacts as described for **Alternative 2** and **Alternative 3**. These impacts are incorporated herein by reference. Since the aggregate daily bag limit under this alternative represents a 60 percent reduction from **Preferred Alternative 1** and a projected 22 percent reduction in aggregate grouper landings, the potential for behavioral and effort change increases over that of **Alternative 3** and **Alternative 2**, thus increasing the potential social impacts by an unknown amount.

7.5 Direct and Indirect Effects on the Administrative Environment

7.5.1 Action 1: Red Grouper Landings Limits

Alternative 1 (status quo/no action) would maintain status quo regulations, which include a two red grouper daily bag limit and a 20-inch minimum size limit. The MRFSS and the SEFSC's Headboat Survey monitor recreational landings. Monitoring recreational landings and enforcing bag and size limits are routine fishery management actions that affect the administrative environment.

Alternatives 2-7 would not change how landings are monitored and therefore would not represent an additional administrative burden for MRFSS or the SEFSC's headboat survey.

Alternative 2 would reduce the daily bag limit to one and establish a three red grouper daily vessel limit. The lower red grouper bag limit and implementation of a vessel limit would increase the number of regulations to enforce, but these regulations could reduce the burden on enforcement by making it easier and faster to determine compliance with regulations (less fish to count and measure). However, if less people comply with the lower bag and vessel limits, then the burden on enforcement would be increased.

Alternative 3 would increase the minimum size limit for red grouper to 22-inches TL. This alternative would not result in any additional regulations to enforce. Minimum size limits are commonly used to control harvest in recreational fisheries. If the higher minimum size limits increase the rate of non-compliance, the burden on law enforcement would be increased.

Alternatives 4A-B would reduce the red grouper daily bag limit from two to one and establish either an August (**Alternative 4A**) or April-May (**Alternative 4B**) closure for all grouper. Closed seasons are used to regulate recreational red snapper and several commercial fisheries, and therefore enforcing closures is part of the normal administrative activities of law enforcement. Although a closed season would represent an additional regulation to enforce, a closure may reduce the overall burden on enforcement by making it simpler to determine whether or not anglers are complying with regulations (less fish to count and measure; either you possess grouper during the closure or you do not possess grouper during the closure). The longer the closed season and the more fishing effort occurring during the closure, the greater the burden on law enforcement is reduced. Applying the closure to all grouper would reduce the burden on enforcement because they would not be required to identify which grouper are being landed. A Gulf-wide closure would not require a line of demarcation, which typically causes some enforcement problems near the line. The burden on enforcement would be increased if state management agencies do not adopt consistent closure regulations. The FWC has previously expressed opposition to closures and they do not intend to adopt consistent regulations for the 2005 November-December interim rule grouper closure. By not adopting consistent state and federal regulations, the burden on enforcement is increased because they must determine if anglers are legally harvesting grouper in state waters when federal waters are closed. Inconsistent regulations would likely result in lower compliance rates and reduce some of the estimated biological reductions expected from a grouper closure.

Preferred Alternative 5 would reduce the red grouper daily bag limit from two to one and establish a February 15 through March 15 closure. This alternative would change one existing regulation (bag limit) and implement one additional regulation (closed season), therefore increasing the burden on enforcement. The closed season would overlap with the commercial grouper closure (February 15 – March 15), and therefore would reduce the burden on enforcement to determine whether fishermen are illegally harvesting grouper during the closed season. However, because the closure only applies to gag, red grouper, and black grouper, enforcement would still be burdened with identifying grouper that legally may be landed during the closure. As with **Alternative 4**, a Gulf-wide closure would not require a line of demarcation, which typically causes some enforcement problems and angler confusion near the line. As stated above, inconsistent state and federal regulations would increase the burden on enforcement and

reduce the biological reductions estimated to occur from a closure.

Alternatives 6 would reduce the red grouper daily bag limit to one and increase the minimum size limit to 21 inches TL. The effects of this alternative on the administrative environment are expected to be similar to those of **Alternative 3**, although slightly less. Increasing the size limit to 21 inches TL or decreasing the red grouper daily bag limit would not result in any additional regulations to enforce. Minimum size limits are commonly used to control harvest in recreational fisheries. If the higher minimum size limits increase the rate of non-compliance, the burden on law enforcement would be increased. However, the larger minimum size limit and the lower daily bag limit are expected to reduce harvest and therefore the number of fish enforcement would have to count and measure when determining compliance.

Alternative 7 would reduce the red grouper daily bag limit from two to one, establish a three red grouper daily vessel limit for vessels not possessing a Coast Guard Certificate of Inspection (COI), and establish a vessel limit of one red grouper per two paying passengers for vessels possessing a COI. The effects of this alternative on the administrative environment are expected to be similar to **Alternative 2** (see discussion above), although slightly greater. Because trip limits would be greater for vessels possessing a COI, the burden on enforcement would be greater to determine compliance with the vessel limit. However, COI vessels account for a relatively small portion of the overall red grouper harvest, and therefore the increased burden on enforcement is not expected to be significant.

Overall, **Alternatives 2-7** are not expected to have significant effects on the administrative environment. Size limits, bag limits, and closed seasons are currently used to manage the harvest of many recreational fish species and therefore changes to these regulations would not represent a significant burden on enforcement. Implementation of vessel limits or closed seasons would increase the number of regulations to enforce and would impact the greatest number of trips (see Table 7.3.4), but the reductions in landings are expected to reduce the amount of time determining compliance. More restrictive management measures could also increase the rate of non-compliance, therefore resulting in an increased burden on enforcement.

7.5.2 Action 2: For-hire Captain and Crew Daily Bag Limit

Alternative 1 (status quo/no action) would maintain status quo regulations, which allow captain and crew to retain daily bag limits of grouper while under charter. Because existing grouper daily bag limits are typically not met, and there is little incentive for captain and crew to supplement the catch of their clients, this alternative does not have any direct or indirect effects on the administrative environment or enforcement. **Preferred Alternative 2** would prohibit captain and crew from retaining daily bag limits of grouper while under charter. This alternative would result in an additional regulation to enforce, but could reduce the burden on enforcement by making it easier and faster to determine compliance with regulations (less fish to count and measure). Additionally, because the regulations would only apply to charter vessels and headboats, the burden on enforcement would be relatively small when compared to the overall recreational grouper fishery, since for-hire vessels only account for 20-25 percent of the annual recreational grouper harvest and a much smaller proportion of the overall vessels fishing in the Gulf of Mexico.

7.5.3 Action 3: Aggregate Grouper Daily Bag Limit

Preferred Alternative 1 would maintain the current aggregate daily bag limit of five grouper. This alternative would not increase the burden on the administrative environment and would not change how landings are monitored. **Alternatives 2-4** would reduce the aggregate daily bag limit to 4, 3 or 2 fish. Reductions to the aggregate daily bag limit could positively benefit enforcement by making it easier to determine compliance with regulations (less fish to count and measure). However, lower aggregate daily bag limits could also result in higher non-compliance and increase the administrative burden on enforcement. If lower aggregate daily bag limits are combined with a lower red grouper daily bag limit, vessel limits, and/or closed seasons, the administrative burden would likely be increased because of the additional complexity of regulations and increased potential for non-compliance. If consistent state regulations are not adopted, the administrative burden would also be greater, because enforcement officers would have to determine compliance with aggregate daily bag limits based on area fished (state versus federal waters).

7.6 Mitigation Measures

Actions 1 and 2 will adversely affect short-term consumer surplus of some recreational anglers in the Gulf of Mexico and may result in fishing trip cancellation, reducing expenditures to the fishery and associated industries. These adverse effects, however, are expected to be less than the impacts associated with more restrictive management measures that would potentially be required if the current recreational landing overages, as projected under the status quo, are not arrested and the fishery allowed to return to the rebuilding plan. Therefore, no mitigation measures are proposed for Actions 1 or 2.

7.7 Cumulative Effects

Section 1508.7 defines cumulative impacts as impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. The proposed actions in this regulatory amendment stem from the regulatory actions implemented by Secretarial Amendment 1 (NMFS 2004a), which implemented a rebuilding plan, a two-fish recreational daily bag limit, and a commercial quota for red grouper. The total allowable catch for SWG was reduced from 9.35 to 8.8 mp (5.9 percent) and for DWG from 1.35 to 1.02 mp (23.0 percent). A quota of 5.31 mp was established for the commercial grouper fishery and 1.25 mp target catch level was established for the recreational fishery. The purpose of Secretarial Amendment 1 was to eliminate overfishing of red grouper by reducing landings by 9.4 percent.

Recreational red grouper landings exceeded the recreational target catch level during both 2003 and 2004. Action 1 would reduce the likelihood that the recreational target catch level will be exceeded. By reducing recreational landings, the effect of maintaining landings at or below the recreational target catch level specified by the rebuilding plan will have a positive benefit on the long-term productivity of the stock.

Recreational actions 1 and 2 would have positive biological benefits for other grouper by reducing fishing pressure and fishing mortality. Because red grouper are part of a multispecies fishery and co-occur with several other grouper, management regulations that apply to the entire grouper fishery would reduce bycatch and landings of all grouper. Gag, which is the primary grouper species landed by recreational anglers, is not overfished or undergoing overfishing, but is considered fully utilized. Reductions in fishing mortality on gag and black grouper, as well as red grouper, could benefit the long-term productivity of these stocks.

Actions 1 and 2 will result in short-term negative economic effects, in addition to the effects of Secretarial Amendment 1. Cumulatively, the economic effects will result in losses in consumer surplus for some recreational anglers and reduced expenditures to the fishery and associated industries. However, these effects are expected to be less than the long-term impacts associated with more restrictive management measures that would potentially be required if the current recreational landing overages are not arrested and the fishery allowed to return to the rebuilding plan.

The Council and NMFS have recently approved or are developing amendments to the Reef Fish FMP, which when considered with Actions in this regulatory amendment could result in additional cumulative biological and economic effects. Amendment 23 to the Reef Fish FMP implemented recreational and commercial management measures to reduce vermilion snapper harvest and rebuild the fishery. Amendment 17/25 to the Reef Fish FMP would establish an indefinite limited access system for for-hire reef fish and CMP permits. Amendment 27 to the Reef Fish FMP proposes to reduce red snapper bycatch in the directed fishery. These actions and their corresponding regulations have various objectives, including rebuilding overfished stocks, maintaining caps on effort, reducing effort, and improving economic efficiency. The details of many of these future actions are still highly uncertain and will be analyzed in greater detail when the Council and NMFS consider these actions in the future. In general, these actions in conjunction with the actions proposed herein, would likely result in positive benefits to the biological environment by accomplishing the objectives stated above. Economic losses from these actions in the short-term are expected to be less than the cumulative benefits of rebuilding stocks and improving economic conditions and efficiency in the long-term. Finally, the FWC has previously expressed opposition to closures and they did not adopt consistent regulations for the 2005 grouper interim rule implemented by NMFS. If the FWC does not to adopt consistent regulations, compliance rates would likely be lower, some effort may shift to state waters during the February 15-March 15 closure, and the cumulative benefits of reducing grouper landings would be less.

7.8 Unavoidable Adverse Effects

Actions 1-3 all have small, and likely negligible effects on the physical environment. Actions 1 and 2 would all benefit the biological environment by reducing the landings of red grouper and potentially other grouper species. Unavoidable adverse effects on the administrative environment from Actions 1 and 2 are the result of additional regulations to enforce or modifications of existing regulations (see Section 7.5). Adverse economic and social effects on the recreational fishery will result from Actions 1 and 2, and are described in section 7.3. However, these unavoidable adverse effects are expected to outweigh the effects of allowing

recreational overages of red grouper to continue.

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

Actions 1 and 2 would affect the relationship between short-term uses and long-term productivity. Actions 1 and 2 would reduce the recreational landings of red grouper, and potentially other grouper, if closures are implemented. Reductions in harvest are expected to benefit the long-term productivity of red grouper and other grouper. Red grouper are currently being rebuilt and reducing harvest will increase the likelihood that red grouper will be rebuilt within the timeframe specified in Secretarial Amendment 1 to the Reef Fish FMP. The Council's preferred alternative for reducing red grouper harvest (**Alternative 5, Action 1**) would include a seasonal closure for red grouper, gag, and black grouper. Applying the closure to gag and black grouper, in addition to red grouper, is expected to benefit the long-term productivity of these species by reducing both discard mortality and fishing mortality during February 15 to March 15 each year. Gag is considered fully utilized. The last stock assessment concluded gag was not overfished or undergoing overfishing. (Turner et al. 2001). However, gag landings have been above the 2001 RFSAP's recommended TAC since 2001. The closure will help to reduce gag landings to levels closer to the recommended TAC. The status of black grouper is unknown, but because gag and black grouper are similar in appearance and often misidentified, applying the seasonal closure to both species will improve compliance.

7.10 Irreversible and Irrecoverable Commitments of Resources

Irreversible commitments are defined as commitments that cannot be reversed, except perhaps in the extreme long term, whereas irretrievable commitments are lost for a period of time. There are no irreversible or irretrievable agency commitments. The Council could decide through future actions to change proposed management measures for the commercial and recreational grouper fishery. Actions 1 and 2 will result in irretrievable losses in consumer surplus and angler expenditures for the recreational fishery, but these losses are expected to outweigh the effects of allowing recreational overages to continue. Economic losses to the recreational grouper fishery are described in Section 7.3.

7.11 Any Other Disclosures

No additional disclosures are needed or known for this action.

8 FINDING OF NO SIGNIFICANT IMPACT

NOAA's Administrative Order 261-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. 1508.27 state the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant in making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

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

The proposed actions will not jeopardize the sustainability of red grouper. The preferred recreational alternatives for reducing red grouper landings would reduce the red grouper daily bag limit to one within a five fish aggregate grouper bag limit, establish a one month closure for red grouper, black grouper, and gag from February 15 to March 15, and prevent captain and crew from retaining a bag limit of grouper while under charter. These alternatives are estimated to reduce landings by more than 33 percent and reduce the likelihood that effort reduction in red grouper would be shifted to other groupers. Not implementing these proposed regulations could jeopardize the recovery of red grouper, requiring more restrictive management measures in the future, and delay in greater TAC allowances that could be possible as the stock is rebuilt. Implementation of these proposed regulations is expected to benefit red grouper by returning recreational landings to the target catch levels specified in the red grouper rebuilding plan.

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

The proposed actions will not jeopardize the sustainability of non-target species. Red grouper are part of a multispecies fishery that includes other grouper, snapper, jacks, and other reef fish species. The preferred recreational alternative intended to reduce or prevent impacts on non-target species will close February 15 to March 15 for gag and black grouper, as well as red grouper. Gag is considered fully utilized and landings have exceeded the RFSAP's recommended ABC since 2001. The seasonal closure overlaps the commercial February 15 through March 15 closure for gag, red grouper, and black grouper, and includes important spawning seasons for all three species. Because red grouper are part of a multispecies fishery, prohibiting the harvest of these species should reduce discard mortality during closed months and prevent effort from shifting to gag and black grouper if only the red grouper fishery were closed. Closures for these grouper should also have positive biological benefits on gag and black grouper by reducing landings by about 7 percent. No additional impacts to red snapper are expected since the recreational fishery is closed during the February 15-March 15 closure period. Some impacts to other reef fish species may occur, but they are not expected to threaten the sustainability of these species, because the duration of the closure is only one month and reef fishes other than grouper and red snapper are less frequently targeted by recreational anglers.

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

The impacts to the physical environment of each of the proposed actions are described in Section 7.1. The primary effects of the grouper fishery on the physical environment generally result from fishing gear interactions with the seafloor. None of the preferred alternatives are expected to cause substantial damage to EFH or ocean and coastal habitat, because these alternatives will not likely change the methods or gears used for harvest. The preferred recreational alternatives would lower the red grouper daily bag limit and establish a one month closed season during February 15 through March 15 for gag, black grouper, and red grouper. If the closed season or lower daily bag limits deter some anglers from taking trips, or they reduce the length of angler trips, than some benefits to the physical environment may occur because of reductions in effort and subsequent habitat interactions. However, these benefits are expected to be small and not significant because the recreational fishery accounts for only about a quarter of the overall red grouper harvest and a small fraction of the overall reef fish harvest.

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

Proposed actions for reducing recreational landings should not adversely affect public health and safety because these actions should not increase fishing trips or boat traffic. Lower daily bag limits may deter some fishermen from traveling farther offshore to catch grouper. The recreational closed season for black grouper, red grouper, and gag during February 15-March 15 will reduce fishing effort during a portion of the spawning season. This time also coincides with generally worse seas conditions and may have some benefit to public health and safety.

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

The proposed actions are not expected to adversely affect threatened or endangered species, or critical habitat of these species. A biological opinion by NMFS Office of Protected Resources found mortalities of endangered and threatened species were known to occur from gears used in the reef fish fishery, but were not likely to jeopardize the continued existence of threatened or endangered species (NMFS 2005c).

(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.)?

The proposed actions are not expected to have a substantial impact on biodiversity or ecosystem function. Proposed recreational Actions 1 and 2 would reduce the recreational landings of red grouper and other grouper. These actions are intended to prevent recreational overages, return recreational landings to levels specified in the red grouper rebuilding plan, and prevent or reduce

shifts in effort to other species resulting from more restrictive red grouper management measures.

Reductions in landings and changes in the abundance of red grouper as the stock rebuilds is likely to have ecological effects. Red grouper prey on a variety of fishes, octopuses, and crustaceans, (Bullock and Smith 1991; Heemstra and Randall 1993). Because red grouper are part of a multispecies fishery that includes other grouper and reef fishes, they likely compete for prey with other predators that have similar diets. Consequently, it is possible that forage species and competitor species could decrease in abundance in response to an increase in red grouper abundance.

However, the relationships among species in marine ecosystems are complex and poorly understood. As a result, the nature and magnitude of ecological effects are difficult to predict with any accuracy. When fully rebuilt, the red grouper spawning stock will be 19 percent larger than the spawning stock size in 2001 ($SS_{2001}/SS_{MSY} = 0.84$), allowing for an additional 0.83 MP GW of red grouper removals annually (TAC = 7.39 MP GW in 2012) based on the rebuilding plan adopted in Secretarial Amendment 1. This increase in landings and red grouper spawning stock size is relatively small when compared to the standing stock biomass and landings of species in the entire reef fish complex. Therefore, the ecological effects of rebuilding the red grouper stock and returning landings to levels specified in the rebuilding plan would likely be undetectable when compared to the entire reef fish complex, and therefore would not substantially impact biodiversity or ecosystem function.

(7) Are significant social and economic impacts interrelated with natural and physical environment effects?

A description of the economic and social impacts of the proposed actions are described in sections 7.3 and 7.4.

The preferred recreational alternatives (Alternative 5, Action 1; Alternative 2, Action 2; Alternative 1, Action 3) are intended to return recreational landings to levels specified in the red grouper rebuilding plan and mitigate impacts resulting from effort shifting occurring due to red grouper management actions. Social and economic impacts from reductions in grouper landings are interrelated with natural and physical environment effects, but are not significant. The positive biological benefits resulting from Actions 1-2 will result in negative economic impacts. However, the impacts of these actions are expected to be less than the impacts that would occur under more restrictive management that may be required in the future as a result of continued landings overages. Continued overages would delay the recovery of red grouper, requiring deviation from the rebuilding plan, more restrictive management measures, and delay in greater harvest allowances that would be possible as the stock is rebuilt. More restrictive management would be expected to result in reduced harvests, reduced value per trip, and potentially reduced numbers of trips. A reduction in trips would result in a reduction in associated expenditures through the fishery and associated industries. This would reduce the overall current and future economic value of the fishery.

The preferred alternatives will reduce short-term consumer surplus in the recreational grouper

fishery by \$366,000-\$404,000 (Table 7.3.4). If all affected anglers cancel their fishing trips during the proposed closed period, foregone expenditures associated with these trips are estimated to be as high as \$40 million (Table 7.3.19).

Pursuant to Executive Order (E.O.) 12866, the preferred recreational alternatives will not meet the \$100 million threshold, nor are there expected to be any significant adverse effects on fees, employment, or competition. Additionally, measures in this action do not adversely affect the environment, public health or safety, or local, or tribal governments or communities, nor do they interfere or with any action of another federal agency. No effects on the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof have been identified. The actions in the proposed action represent normal management options or practices and, therefore, do not raise novel legal or policy issues.

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

Controversy includes cases where there is a dispute about the potential environmental consequences of a major federal action, but does not include general opposition to an action. When determining controversy and significance, socio-economic factors related to users of a resource should be considered (NAO 216-6 Sec. 6.02(i)). The proposed actions are not controversial. Although recreational anglers have largely opposed the proposed actions, reasons for opposition have not been with regard to the environmental consequences. Rather, public opposition has largely been related to actions not considered in this regulatory amendment, such as fishery allocation and impacts by the commercial sector, particularly longlines. The public has also questioned the accuracy of landings data and the magnitude of economic impacts associated with fishery closures. Economic impacts were considered in this amendment and are summarized in Sections 4, 5, and 7.

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

The proposed actions are not expected to impact historic or cultural resources, park land, prime farmlands, wetlands, or wild and scenic rivers because those resources are not in the EEZ. The area affected by the proposed actions includes areas identified as EFH for several managed species. Several HAPCs, marine sanctuaries, and marine reserves are found within the Gulf EEZ, where grouper are caught. In most of these areas, gears used to harvest grouper are prohibited.

The proposed actions do not significantly alter the gears used for harvesting grouper or the amount of interactions with habitat. A recreational closed season (February 15-March 15) would have some minor benefits to EFH by reducing fishing effort and the amount of gear interactions with habitat during the closure.

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

There are no highly uncertain, unique, or unknown risks associated with the preferred alternatives. Not reducing the recreational landings of red grouper could increase the risk that the recreational sector will continue to exceed its target catch level and delay stock rebuilding.

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

Cumulative effects are described in Section 4.7. The preferred recreational alternatives would maintain the positive biological benefits realized by Secretarial Amendment 1 to the Reef Fish FMP (NMFS 2004a), which established a rebuilding plan for red grouper and quotas for red grouper, SWG and DWG. The preferred recreational alternatives will increase the negative economic effects incurred by higher fuel prices and implementation of Secretarial Amendment 1. Losses in consumer surplus and expenditures are estimated to occur from reduction of the daily bag limit and the one-month closure for red grouper, black grouper, and gag. However, the impacts of these preferred alternatives are expected to be less than the impacts that would occur in the future if landings overages were allowed to continue. Continued overages could require more restrictive management measures, and delay increases in harvest as the stock rebuilds.

The effects of these preferred alternatives will continue into the future. A red grouper stock assessment is scheduled for fall 2006. This assessment will allow NMFS and the Council to determine if adequate progress is being made for rebuilding the fishery. Depending on the results of the assessment, changes to management measures may be necessary.

The Council and NMFS have also recently approved or are developing amendments to the Reef Fish FMP, which could result in additional cumulative biological and economic effects. These amendments and actions and their corresponding regulations have various objectives, including rebuilding overfished stocks, maintaining caps on effort, reducing fishing effort, and improving economic efficiency. These amendments and proposed actions, in conjunction with the preferred alternatives proposed herein, are intended to positively benefit the biological environment. Economic losses of these collective actions in the short-term are expected to be less than the cumulative benefits of rebuilding stocks and improving economic conditions and efficiency in the long-term. Overall the cumulative effects of the preferred recreational alternatives when combined with other Gulf fishery actions are not expected to be significant because the recreational landings of red grouper represent a minor component of total reef fish landings.

(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 historic resources?

The proposed actions will not result in any significant impacts on scientific, cultural, or historical resources. No known sites included in the National Register of Historic Places have been identified in the Gulf EEZ.

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

nonindigenous species?

The proposed actions will not result in the introduction or spread of a non-indigenous species. These alternatives only affect grouper and other reef fish species harvested from the Gulf of Mexico.

(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?

Size limits, bag limits, and closed seasons are currently used by the Council to limit the harvest of a variety of reef fish and coastal migratory species; therefore the actions in this regulatory amendment would not set a precedent for future actions and do not represent a decision in principle about a future consideration.

(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?

The proposed actions will not threaten or violate federal, state, or local laws or regulations imposed for the protection of the environment. These include the ESA, CZMA, and other applicable laws described in Section 9.

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

The proposed actions are not expected to result in cumulative adverse effects that have substantial effects on target or non-target species. The environmental consequences and cumulative impacts of the proposed actions are described in detail in Section 7. Cumulative biological effects are expected to be positive, when considered in conjunction with past, present, and reasonably foreseeable future actions being considered by the Council. The preferred recreational alternatives are expected to result in losses in consumer surplus and expenditures. These economic effects are in addition to the economic impacts incurred from higher fuel prices and implementation of the red grouper rebuilding plan in Secretarial Amendment 1 to the Reef Fish FMP. Overall, these economic impacts are not expected to be significant. The economic impacts of the preferred recreational alternatives are expected to be less than the impacts that would occur in the future if landings overages were allowed to continue.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting EA prepared for the GMFMC's Regulatory Amendment to the Reef Fish FMP, it is hereby determined that the proposed actions to reduce the recreational red grouper daily bag limit, establish a recreational closure for red grouper, black grouper, and gag from February 15 to March 15, and prohibit captain and crew from retaining bag limits of grouper while under charter would not significantly affect the quality of the human environment as described above and in the supporting EA. Accordingly, preparation of an EIS is not necessary for this action

Assistant Administrator for Fisheries, NOAA

Date

9 OTHER APPLICABLE LAW

The MSFCMA (16 U.S.C. 1801 et seq.) provides the authority for U.S. fishery management. 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 within which those fisheries are conducted. This environmental assessment is an integrated document that combines analyses necessary for the National Environmental Policy Act (NEPA), the Regulatory Flexibility Act (RFA), and Executive Order 12866: Regulatory Planning and Review.

NEPA requires all federal actions, such as the formulation of fishery management plans, to be evaluated for potential environmental and human environment impacts, and for these impacts to be assessed and reported to the public. NEPA requires federal agencies to evaluate a range of alternatives. For this amendment, the Council conducted an Environmental Assessment, which is a concise statement that determines whether the proposed amendment will have a significant impact on the environment.

The RFA requires federal agencies to assess the impacts of regulatory actions implemented through notice and comment rulemaking procedures on small businesses, small organizations, and small governmental entities, with the goal of minimizing adverse impacts of burdensome regulations and record-keeping requirements on those entities. These analyses, which describe the type and number of small businesses affected, are provided in Section 5 and will be published in the *Federal Register* in full or in summary for public comment and submitted to the chief counsel for advocacy of the Small Business Administration.

To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (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 associated with proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. These analyses can be found in Section 4 of this amendment.

Other major laws affecting federal fishery management decision-making are summarized below.

9.1 Administrative Procedures Act

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

9.2 Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) of 1972, as amended, requires that federal activities that affect any land or water use or natural resource of a state's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency determination are set forth in NOAA regulations at 15 C.F.R. part 930, subpart C. NMFS has determined this action is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. This determination will be submitted to the responsible state agencies under Section 307 of the CZMA.

9.3 Data Quality Act

The Data Quality Act (DQA) (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. 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. Pursuant to Section 515 of Public Law 106-554, this information document has undergone a predissemination review by the Southeast Regional Office, Sustainable Fisheries Division, and is available upon request.

9.4 Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. Section 1531 et seq.) requires that federal agencies use their authorities to conserve endangered and threatened species. The ESA requires NMFS, when proposing a fishery action that "may affect" critical habitat or endangered or threatened species, to consult with the appropriate administrative agency (itself for most marine species, the USFWS 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. A formal consultation for the Gulf of Mexico reef fish fishery was completed in 2005 and concluded mortalities of endangered and threatened species were uncommon from gear used in the reef fish fishery and were not likely to jeopardize the continued existence of threatened or endangered species. Based on reinitiation triggers in 50 CFR 402.16, there is no need to conduct another consultation for this action.

9.5 Executive Orders

9.5.1 E.O. 12630: Takings

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

9.5.2 E.O. 13089: Coral Reef Protection

The Executive Order on Coral Reef Protection requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and, to the extent permitted by law, ensure that actions that they authorize, fund or carry out do not degrade the condition of that ecosystem. There are no implications to coral reefs by the action proposed.

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

9.5.4 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. This action would have no impacts to marine protected areas.

9.6 Marine Mammal Protection Act

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

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

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

The MMPA requires commercial fisheries to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals in each fishery. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. The GOM reef fish fishery is listed in Category III (69 FR 231). Because similar gears (hook-and-line, spears) are used in the recreational fishery, there is likely no known risk of serious injury or mortality to marine mammals resulting from the recreational fishery.

9.7 Paperwork Reduction Act

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

Permit application processes are not being changed by this regulatory amendment, and no new reporting requirements or burdens are being proposed. Therefore, NMFS does not need to submit an additional request for information collection to the Office of Management and Budget for review.

9.8 Small Business Act

The Small Business Act of 1953, as amended, Section 8(a), 15 U.S.C. 634(b)(6), 636(j), 637(a) and (d); Public Laws 95-507 and 99-661, Section 1207; and Public Laws 100-656 and 101-37 are administered by the Small Business Administration. Because most businesses associated with fishing are considered small businesses, NMFS, must make an assessment of how those regulations will affect small businesses. Implications to small businesses are discussed in Section 5, herein.

9.9 Essential Fish Habitat

The amended MSFCMA included a new habitat conservation provision known as EFH that requires each existing and any new FMPs to describe and identify EFH for each federally managed species, minimize to the extent practicable impacts from fishing activities on EFH that are more than minimal and not temporary in nature, and identify other actions to encourage the conservation and enhancement of that EFH. To address these requirements the Council has, under separate action, approved an EIS (GMFMC 2004a) to address the new EFH requirements contained within the MSFCMA. Section 305(b)(2) requires federal agencies to obtain a consultation for any action that may adversely affect EFH. An EFH consultation was conducted for this action and concluded this action will not adversely affect EFH.

10 LIST OF PREPARERS

Gulf of Mexico Fishery Management Council

Frank Kennedy - Fishery Biologist

National Marine Fisheries Service

Andrew Strelcheck – Fishery Biologist

Stephen Holiman – Fishery Economist

David Carter – Fishery Economist

11 LIST OF AGENCIES AND PERSONS CONSULTED

The following agencies were consulted on the provisions of this amendment:

Gulf of Mexico Fishery Management Council:

Reef Fish Advisory Panel

National Marine Fisheries Service:

Southeast Regional Office

Southeast Fisheries Science Center

Coastal Zone Management Offices:

Texas, Louisiana, Mississippi, Alabama, Florida

Other Agencies, Organizations, and Persons:

Alabama Cooperative Extension Service

Alabama Department of Conservation and Natural Resources, Marine Resources Division

Florida Department of Environmental Protection

Florida Fish and Wildlife Conservation Commission

Florida Sea Grant

Louisiana Cooperative Extension Service

Louisiana Department of Wildlife and Fisheries

Mississippi Cooperative Extension Service

Mississippi Department of Marine Resources

National Marine Fisheries Service Southeast Regional Office

National Marine Fisheries Service Southeast Fisheries Science Center

National Marine Fisheries Service Washington Office

National Marine Fisheries Service Law Enforcement

Texas Cooperative Extension Service

Texas Parks and Wildlife Department

United States Fish & Wildlife Service

United States Coast Guard

12 TABLES

12.1 Section 6 Affected Environment Tables

Table 6.3.1. Recreational landings of gag and red grouper (lbs total weight), by mode, 1991-2004.

Year	Gag				Red Grouper			
	Shore	Private	Charter	Headboat	Shore	Private	Charter	Headboat
1991	136,447	1,836,886	140,702	110,920	62,097	1,660,339	58,576	67,126
1992	44,738	1,190,687	493,566	121,540	153,105	2,536,645	360,229	69,191
1993	55,485	1,484,750	742,128	155,760	123,319	1,927,369	182,234	95,075
1994	10,190	1,372,734	563,736	159,300	13,691	1,788,394	235,555	73,307
1995	101,958	1,878,310	643,351	118,000	9,193	1,452,223	631,417	112,706
1996	17,383	1,462,454	539,045	101,480	0	646,448	186,935	108,820
1997	16,415	1,755,373	938,507	96,760	8,408	434,326	179,704	51,475
1998	140,545	2,078,697	1,567,519	237,180	4,839	562,958	175,812	58,926
1999	52,139	2,506,930	1,121,352	186,440	0	993,540	172,589	63,934
2000	78,360	3,487,102	1,174,368	199,992	0	1,492,441	732,368	70,161
2001	0	2,877,556	977,312	116,647	0	1,047,165	368,142	51,331
2002	16,920	3,028,208	736,098	79,845	0	1,432,454	311,726	40,544
2003	5,183	2,591,236	681,825	109,769	0	1,085,874	273,141	53,626
2004	29,614	3,612,264	994,447	NA	0	2,606,503	587,788	NA

Source: MRFSS, Headboat survey, and Texas Parks and Wildlife survey. Headboat landings for 2004 are not available.

Table 6.3.2. Socioeconomic characteristics of recreational anglers.

	Charter	Private/Rental	Shore
Average Age			
Alabama	42.17	42.49	47.59
Florida East	43.60	42.41	44.39
Florida West	43.85	44.03	44.18
Louisiana	44.99	44.35	41.39
Mississippi	43.70	41.51	41.74
Average Income			
Alabama	57,980	54,090	42,110
Florida East	94,590	56,250	44,100
Florida West	78,430	51,370	42,590
Louisiana	86,340	55,180	40,870
Mississippi	61,730	48,500	31,300
Average Number of Fishing Trips			
Alabama	3.64	31.99	34.92
Florida East	12.16	53.26	56.94
Florida West	10.83	47.07	50.56
Louisiana	11.73	30.50	31.78
Mississippi	15.09	43.34	69.63
Average Years of Fishing Experience			
Alabama	13.07	21.56	20.76
Florida East	18.37	22.20	21.18
Florida West	17.77	21.51	19.37
Louisiana	22.94	24.08	18.24
Mississippi	12.62	21.83	21.33
Average Years of Fishing Experience in the State			
Alabama	7.81	19.75	14.54
Florida East	10.61	18.07	15.04
Florida West	11.65	16.70	13.14
Louisiana	16.17	22.21	15.97
Mississippi	7.18	18.59	16.46
Average Total Trip Expenditures			
Alabama	479.17	53.55	150.25
Florida East	380.32	52.10	82.91
Florida West	622.29	127.44	98.88
Louisiana	326.26	39.35	57.56
Mississippi	296.91	27.04	28.27

Source: Holiman (2000).

Table 6.3.3. Economic characteristics of charterboats and headboats.

Characteristic	Charterboats	Headboats
All Vessel Classes		
Revenues (\$)	76,960	404,172
Costs (\$)	40,200	65,962
Profits (\$)	36,758	338,209
Avg. passenger	5	30
Max. passenger	8	60
Length (feet)	37	65
Horsepower	493	786
6 or less maximum passenger capacity		
Revenues	70,491	
Costs	35,540	
Profits	34,949	
Avg. passenger	4	
Length	35	
Horsepower	475	
7 to 12 maximum passenger capacity		
Revenues	129,813	
Costs	43,311	
Profits	86,502	
Avg. passenger	6	
Length	41	
Horsepower	546	
13 to 30 maximum passenger capacity		
Revenues	113,266	298,812
Costs	73,887	35,750
Profits	39,379	263,062
Avg. passenger	9	17
Length	44	43
Horsepower	617	726
31 to 60 maximum passenger capacity		
Revenues	149,905	327,615
Costs	116,099	46,602
Profits	33,806	281,013
Avg. passenger	21	27
Length	60	64
Horsepower	750	735
61 or greater maximum passenger capacity		
Revenues		570,376
Costs		109,616
Profits		460,760
Avg. passenger		40
Length		76
Horsepower		903

Source: Holland et al. (1999) and Sutton et al. (1999).

Table 6.3.4. Economic characteristics of charterboats and headboats by geographical area.

Characteristic	Charterboats		Headboats	
	Florida	Rest of Gulf	Florida	Rest of Gulf
All Vessel Classes				
Revenues (\$)	68,233	106,118	318,512	630,046
Costs (\$)	37,984	62,624	69,410	87,621
Profits (\$)	30,249	43,494	249,103	542,425
Avg. passenger	4	8	25	41
Max. passenger	6	14	56	71
Length (feet)	35	41	60	74
Horsepower	465	615	795	732
6 or less maximum passenger capacity				
Revenues	68,620	69,748		
Costs	37,962	34,417		
Profits	30,656	35,330		
Avg. passenger	4	4		
Length	35	35		
Horsepower	467	553		
7 to 12 maximum passenger capacity				
Revenues	67,760	186,793		
Costs	30,116	70,944		
Profits	37,643	115,848		
Avg. passenger	5	8		
Length	31	48		
Horsepower	303	706		
13 to 30 maximum passenger capacity				
Revenues	55,124	141,134	352,515	84,000
Costs	43,407	94,458	30,296	57,568
Profits	11,716	46,676	322,219	26,432
Avg. passenger	6	11	18	10
Length	39	47	40	52
Horsepower	492	687	757	600
31 to 60 maximum passenger capacity				
Revenues		176,629	227,996	556,080
Costs		145,124	58,459	37,296
Profits		31,505	169,535	518,784
Avg. passenger		23	24	36
Length		59	61	70
Horsepower		738	704	875
61 or greater maximum passenger capacity				
Revenues			490,448	840,524
Costs			124,790	145,460
Profits			365,657	695,064
Avg. passenger			32	53
Length			73	83
Horsepower			1,083	624

Source: Holland et al. (1999) and Sutton et al. (1999).

Table 6.3.5. Species in the Gulf shallow-water and deep-water grouper complex.			
Species Code	Common Name	Deep water	Shallow water
1410	GROUPE		X
1411	HIND, SPECKLED	x	
1412	HIND, ROCK		X
1413	HIND, RED		X
1414	GROUPE, SNOWY	x	
1415	GROUPE, YELLOWEDGE	x	
1416	GROUPE, RED		X
1420	GROUPE, MISTY	x	
1422	GROUPE, BLACK		X
1423	GROUPE, GAG		X
1424	SCAMP		X
1425	GROUPE, YELLOWMOUTH		X
1426	GROUPE, YELLOWFIN		X
3111	SAND PERCH, DWARF		X
3110	SAND PERCH		X
4740	GROUPE, WARSAW	x	

12.2 Section 7 Environmental Consequences Tables

Table 7.3.1. Estimated impacts of Action 1 (recreational red grouper landings reduction), all angler trips.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	63,499	63,499	140,720	63,499	63,499	63,499	115,363	63,499
Angler trips affected by the red grouper bag limit	3,647	21,316	2,823	30,315	30,315	30,315	23,438	21,316
Angler trips affected by the red grouper vessel limit	0	10,191	0	0	0	0	0	13,159
Angler trips affected by the aggregate grouper bag limit	3,231	3,231	1,799	3,231	3,231	3,231	2,407	3,231
Angler trips affected by the aggregate closed season	0	0	0	324,188	468,804	165,302	0	0
Reduction in fish kept	38,322	61,217	78,822	102,613	200,567	128,143	76,507	62,531
Reduction in value	\$139,704	\$234,487	\$277,920	\$398,448	\$745,570	\$506,106	\$277,506	\$239,930
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	53,318	53,318	195,742	53,318	53,318	53,318	140,586	53,318
Angler trips affected by the red grouper bag limit	25,590	56,727	14,431	87,388	87,388	87,388	70,981	56,727
Angler trips affected by the red grouper vessel limit	0	54,972	0	0	0	0	0	65,291
Angler trips affected by the aggregate grouper bag limit	15,166	15,166	10,475	15,166	15,166	15,166	11,237	15,166
Angler trips affected by the aggregate closed season	0	0	0	435,265	654,276	183,824	0	0
Reduction in fish kept	70,206	158,027	169,934	301,896	351,420	168,907	163,201	163,943
Reduction in value	\$275,711	\$639,290	\$661,247	\$1,222,603	\$1,388,743	\$680,366	\$642,093	\$663,781

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.2. Estimated impacts of Action 1 (recreational red grouper landings reduction), charter sector.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	34,626	34,626	80,882	34,626	34,626	34,626	62,640	34,626
Angler trips affected by the red grouper bag limit	3,647	1,432	2,823	10,431	10,431	10,431	7,807	1,432
Angler trips affected by the red grouper vessel limit	0	10,191	0	0	0	0	0	13,159
Angler trips affected by the aggregate grouper bag limit	3,231	3,231	1,799	3,231	3,231	3,231	2,407	3,231
Angler trips affected by the aggregate closed season	0	0	0	71,117	150,272	19,518	0	0
Reduction in fish kept	24,072	35,010	40,203	41,948	110,662	54,947	38,268	36,325
Reduction in value	\$89,406	\$134,690	\$139,924	\$155,993	\$418,010	\$214,946	\$141,088	\$140,132
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	19,716	19,716	94,647	19,716	19,716	19,716	65,652	19,716
Angler trips affected by the red grouper bag limit	6,963	4,950	2,237	25,536	25,536	25,536	19,758	4,950
Angler trips affected by the red grouper vessel limit	0	37,654	0	0	0	0	0	47,973
Angler trips affected by the aggregate grouper bag limit	8,732	8,732	6,325	8,732	8,732	8,732	7,088	8,732
Angler trips affected by the aggregate closed season	0	0	0	58,094	166,809	21,179	0	0
Reduction in fish kept	19,835	51,152	54,604	59,393	150,903	47,863	46,840	57,068
Reduction in value	\$82,118	\$211,769	\$211,917	\$233,581	\$587,363	\$194,185	\$188,492	\$236,260

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.3. Estimated impacts of Action 1 (recreational red grouper landings reduction), private sector.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	28,873	28,873	59,838	28,873	28,873	28,873	52,723	28,873
Angler trips affected by the red grouper bag limit	0	19,884	0	19,884	19,884	19,884	15,631	19,884
Angler trips affected by the red grouper vessel limit	0	0	0	0	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	0	0	0	0	0	0	0
Angler trips affected by the aggregate closed season	0	0	0	253,071	318,533	145,783	0	0
Reduction in fish kept	14,250	26,207	38,619	60,665	89,905	73,196	38,238	26,207
Reduction in value	\$50,298	\$99,797	\$137,995	\$242,455	\$327,561	\$291,161	\$136,418	\$99,797
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	33,602	33,602	101,095	33,602	33,602	33,602	74,934	33,602
Angler trips affected by the red grouper bag limit	18,627	51,777	12,193	61,852	61,852	61,852	51,223	51,777
Angler trips affected by the red grouper vessel limit	0	17,318	0	0	0	0	0	17,318
Angler trips affected by the aggregate grouper bag limit	6,434	6,434	4,149	6,434	6,434	6,434	4,149	6,434
Angler trips affected by the aggregate closed season	0	0	0	377,171	487,467	162,645	0	0
Reduction in fish kept	50,371	106,875	115,329	242,503	200,517	121,044	116,361	106,875
Reduction in value	\$193,593	\$427,521	\$449,330	\$989,022	\$801,380	\$486,181	\$453,601	\$427,521

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.4. Action 1 (recreational red grouper landings reduction), difference from status quo (Alternative 1), all angler trips.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	77,221	0	0	0	51,864	0
Angler trips affected by the red grouper bag limit	0	17,669	-824	26,668	26,668	26,668	19,791	17,669
Angler trips affected by the red grouper vessel limit	0	10,191	0	0	0	0	0	13,159
Angler trips affected by the aggregate grouper bag limit	0	0	-1,432	0	0	0	-824	0
Angler trips affected by the aggregate closed season	0	0	0	324,188	468,804	165,302	0	0
Reduction in fish kept	0	22,895	40,500	64,291	162,245	89,821	38,185	24,209
Reduction in value	\$0	\$94,783	\$138,216	\$258,744	\$605,866	\$366,402	\$137,802	\$100,226
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	142,424	0	0	0	87,268	0
Angler trips affected by the red grouper bag limit	0	31,137	-11,160	61,798	61,798	61,798	45,390	31,137
Angler trips affected by the red grouper vessel limit	0	54,972	0	0	0	0	0	65,291
Angler trips affected by the aggregate grouper bag limit	0	0	-4,692	0	0	0	-3,929	0
Angler trips affected by the aggregate closed season	0	0	0	435,265	654,276	183,824	0	0
Reduction in fish kept	0	87,821	99,728	231,690	281,214	98,701	92,995	93,737
Reduction in value	\$0	\$363,579	\$385,536	\$946,892	\$1,113,032	\$404,655	\$366,382	\$388,070

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per paying passenger for COI permitted vessels

Table 7.3.5. Action 1 (recreational red grouper landings reduction), difference from status quo (Alternative 1), charter angler trips.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	46,256	0	0	0	28,013	0
Angler trips affected by the red grouper bag limit	0	-2,216	-824	6,784	6,784	6,784	4,160	-2,216
Angler trips affected by the red grouper vessel limit	0	10,191	0	0	0	0	0	13,159
Angler trips affected by the aggregate grouper bag limit	0	0	-1,432	0	0	0	-824	0
Angler trips affected by the aggregate closed season	0	0	0	71,117	150,272	19,518	0	0
Reduction in fish kept	0	10,938	16,131	17,876	86,591	30,875	14,196	12,253
Reduction in value	\$0	\$45,284	\$50,518	\$66,587	\$328,603	\$125,539	\$51,682	\$50,726
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	74,931	0	0	0	45,935	0
Angler trips affected by the red grouper bag limit	0	-2,014	-4,726	18,573	18,573	18,573	12,795	-2,014
Angler trips affected by the red grouper vessel limit	0	37,654	0	0	0	0	0	47,973
Angler trips affected by the aggregate grouper bag limit	0	0	-2,407	0	0	0	-1,645	0
Angler trips affected by the aggregate closed season	0	0	0	58,094	166,809	21,179	0	0
Reduction in fish kept	0	31,317	34,769	39,557	131,068	28,027	27,005	37,232
Reduction in value	\$0	\$129,651	\$129,799	\$151,463	\$505,245	\$112,067	\$106,374	\$154,142

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.6. Action 1 (recreational red grouper landings reduction), difference from status quo (Alternative 1), private angler trips.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	30,965	0	0	0	23,851	0
Angler trips affected by the red grouper bag limit	0	19,884	0	19,884	19,884	19,884	15,631	19,884
Angler trips affected by the red grouper vessel limit	0	0	0	0	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	0	0	0	0	0	0	0
Angler trips affected by the aggregate closed season	0	0	0	253,071	318,533	145,783	0	0
Reduction in fish kept	0	11,956	24,369	46,415	75,655	58,946	23,988	11,956
Reduction in value	\$0	\$49,500	\$87,698	\$192,157	\$277,263	\$240,863	\$86,121	\$49,500
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	67,493	0	0	0	41,332	0
Angler trips affected by the red grouper bag limit	0	33,150	-6,434	43,224	43,224	43,224	32,596	33,150
Angler trips affected by the red grouper vessel limit	0	17,318	0	0	0	0	0	17,318
Angler trips affected by the aggregate grouper bag limit	0	0	-2,284	0	0	0	-2,284	0
Angler trips affected by the aggregate closed season	0	0	0	377,171	487,467	162,645	0	0
Reduction in fish kept	0	56,504	64,959	192,133	150,146	70,673	65,990	56,504
Reduction in value	\$0	\$233,928	\$255,737	\$795,429	\$607,787	\$292,588	\$260,008	\$233,928

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.7. Action 1 (recreational red grouper landings reduction), difference from preferred alternative (Alternative 5), all angler trips.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	77,221	0	0	0	51,864	0
Angler trips affected by the red grouper bag limit	-26,668	-8,999	-27,492	0	0	0	-6,877	-8,999
Angler trips affected by the red grouper vessel limit	0	10,191	0	0	0	0	0	13,159
Angler trips affected by the aggregate grouper bag limit	0	0	-1,432	0	0	0	-824	0
Angler trips affected by the aggregate closed season	-165,302	-165,302	-165,302	158,886	303,503	0	-165,302	-165,302
Reduction in fish kept	-89,821	-66,926	-49,320	-25,530	72,425	0	-51,636	-65,612
Reduction in value	-\$366,402	-\$271,619	-\$228,187	-\$107,658	\$239,464	\$0	-\$228,600	-\$266,177
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	142,424	0	0	0	87,268	0
Angler trips affected by the red grouper bag limit	-61,798	-30,661	-72,957	0	0	0	-16,407	-30,661
Angler trips affected by the red grouper vessel limit	0	54,972	0	0	0	0	0	65,291
Angler trips affected by the aggregate grouper bag limit	0	0	-4,692	0	0	0	-3,929	0
Angler trips affected by the aggregate closed season	-183,824	-183,824	-183,824	251,441	470,452	0	-183,824	-183,824
Reduction in fish kept	-98,701	-10,880	1,027	132,989	182,514	0	-5,706	-4,964
Reduction in value	-\$404,655	-\$41,076	-\$19,119	\$542,237	\$708,377	\$0	-\$38,273	-\$16,585

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.8. Action 1 (recreational red grouper landings reduction), difference from preferred alternative (Alternative 5), charter angler trips.								
	2003							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	46,256	0	0	0	28,013	0
Angler trips affected by the red grouper bag limit	-6,784	-8,999	-7,608	0	0	0	-2,624	-8,999
Angler trips affected by the red grouper vessel limit	0	10,191	0	0	0	0	0	13,159
Angler trips affected by the aggregate grouper bag limit	0	0	-1,432	0	0	0	-824	0
Angler trips affected by the aggregate closed season	-19,518	-19,518	-19,518	51,599	130,754	0	-19,518	-19,518
Reduction in fish kept	-30,875	-19,937	-14,744	-12,999	55,716	0	-16,679	-18,622
Reduction in value	-\$125,539	-\$80,256	-\$75,021	-\$58,952	\$203,064	\$0	-\$73,858	-\$74,813
	2004							
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7
				4a	4b			
Angler trips affected by the red grouper minimum size limit	0	0	74,931	0	0	0	45,935	0
Angler trips affected by the red grouper bag limit	-18,573	-20,587	-23,299	0	0	0	-5,778	-20,587
Angler trips affected by the red grouper vessel limit	0	37,654	0	0	0	0	0	47,973
Angler trips affected by the aggregate grouper bag limit	0	0	-2,407	0	0	0	-1,645	0
Angler trips affected by the aggregate closed season	-21,179	-21,179	-21,179	36,915	145,631	0	-21,179	-21,179
Reduction in fish kept	-28,027	3,289	6,742	11,530	103,041	0	-1,023	9,205
Reduction in value	-\$112,067	\$17,584	\$17,731	\$39,396	\$393,178	\$0	-\$5,693	\$42,075

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.9. Action 1 (recreational red grouper landings reduction), difference from preferred alternative (Alternative 5), private angler trips.									
	2003								
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7	
				4a	4b				
Angler trips affected by the red grouper minimum size limit	0	0	30,965	0	0	0	23,851	0	
Angler trips affected by the red grouper bag limit	-19,884	0	-19,884	0	0	0	-4,253	0	
Angler trips affected by the red grouper vessel limit	0	0	0	0	0	0	0	0	
Angler trips affected by the aggregate grouper bag limit	0	0	0	0	0	0	0	0	
Angler trips affected by the aggregate closed season	-145,783	-145,783	-145,783	107,287	172,749	0	-145,783	-145,783	
Reduction in fish kept	-58,946	-46,989	-34,576	-12,531	16,709	0	-34,957	-46,989	
Reduction in value	-\$240,863	-\$191,363	-\$153,165	-\$48,706	\$36,400	\$0	-\$154,742	-\$191,363	
	2004								
	Alt 1	Alt 2	Alt 3	Alt 4		Alt 5	Alt 6	Alt 7	
				4a	4b				
Angler trips affected by the red grouper minimum size limit	0	0	67,493	0	0	0	41,332	0	
Angler trips affected by the red grouper bag limit	-43,224	-10,074	-49,658	0	0	0	-10,629	-10,074	
Angler trips affected by the red grouper vessel limit	0	17,318	0	0	0	0	0	17,318	
Angler trips affected by the aggregate grouper bag limit	0	0	-2,284	0	0	0	-2,284	0	
Angler trips affected by the aggregate closed season	-162,645	-162,645	-162,645	214,526	324,822	0	-162,645	-162,645	
Reduction in fish kept	-70,673	-14,169	-5,715	121,459	79,473	0	-4,683	-14,169	
Reduction in value	-\$292,588	-\$58,660	-\$36,851	\$502,841	\$315,199	\$0	-\$32,580	-\$58,660	

Alt 1 = status quo/no action

Alt 2 = 1-fish red grouper bag limit or 3 fish per vessel, whichever is less

Alt 3 = 22-inch red grouper minimum size limit

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Alt 6 = 1-fish red grouper bag limit and a 21-inch minimum size limit

Alt 7 = 1-fish red grouper bag limit or 3 fish per vessel or 1 fish per 2 paying passengers for COI permitted vessels

Table 7.3.10. Estimated impacts of Action 3 (recreational aggregate grouper bag limit), all angler trips.				
	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	63,499	63,499	63,499	63,499
Angler trips affected by the red grouper bag limit	3,647	3,647	3,647	3,647
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	3,231	11,885	27,241	74,647
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	38,322	52,617	78,495	141,286
Reduction in value	\$139,704	\$198,884	\$306,022	\$565,973
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	53,318	53,318	53,318	53,318
Angler trips affected by the red grouper bag limit	25,590	25,590	25,590	25,590
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	15,166	36,607	62,438	106,996
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	70,206	105,123	160,808	255,552
Reduction in value	\$275,711	\$420,266	\$650,671	\$1,042,122

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.11. Estimated impacts of Action 3 (recreational aggregate grouper bag limit), charter sector.

	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	34,626	34,626	34,626	34,626
Angler trips affected by the red grouper bag limit	3,647	3,647	3,647	3,647
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	3,231	9,026	17,267	27,820
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	24,072	33,355	49,746	77,766
Reduction in value	\$89,406	\$127,838	\$195,696	\$311,700
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	19,716	19,716	19,716	19,716
Angler trips affected by the red grouper bag limit	6,963	6,963	6,963	6,963
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	8,732	15,141	32,928	44,083
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	19,835	33,700	61,957	109,536
Reduction in value	\$82,118	\$139,517	\$256,371	\$452,559

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.12. Estimated impacts of Action 3 (recreational aggregate grouper bag limit), private sector.

	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	28,873	28,873	28,873	28,873
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	2,859	9,974	46,827
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	14,250	19,262	28,750	63,519
Reduction in value	\$50,298	\$71,047	\$110,326	\$254,273
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	33,602	33,602	33,602	33,602
Angler trips affected by the red grouper bag limit	18,627	18,627	18,627	18,627
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	6,434	21,466	29,510	62,914
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	50,371	71,423	98,850	146,015
Reduction in value	\$193,593	\$280,749	\$394,299	\$589,563

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.13. Action 3 (recreational aggregate grouper bag limit), difference from status quo (Alternative 1), all angler trips.

	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	8,654	24,010	71,416
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	0	14,295	40,173	102,964
Reduction in value	\$0	\$59,180	\$166,318	\$426,269
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	21,441	47,272	91,830
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	0	34,917	90,602	185,346
Reduction in value	\$0	\$144,555	\$374,960	\$766,411

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.14. Action 3 (recreational aggregate grouper bag limit), difference from status quo (Alternative 1), charter angler trips.				
	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	5,795	14,036	24,589
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	0	9,283	25,674	53,694
Reduction in value	\$0	\$38,431	\$106,290	\$222,294
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	6,409	24,195	35,350
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	0	13,865	42,122	89,701
Reduction in value	\$0	\$57,399	\$174,253	\$370,441

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.15. Action 3 (recreational aggregate grouper bag limit), difference from status quo (Alternative 1), private angler trips.				
	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	2,859	9,974	46,827
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	0	5,012	14,500	49,269
Reduction in value	\$0	\$20,749	\$60,028	\$203,975
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	0	15,032	23,076	56,480
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	0	21,052	48,480	95,645
Reduction in value	\$0	\$87,156	\$200,706	\$395,970

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.16. Action 3 (recreational aggregate grouper bag limit), difference from preferred alternative (Alternative 3), all angler trips.				
	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	-24,010	-15,355	0	47,406
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	-40,173	-25,879	0	62,790
Reduction in value	-\$166,318	-\$107,138	\$0	\$259,951
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	-47,272	-25,830	0	44,559
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	-90,602	-55,685	0	94,744
Reduction in value	-\$374,960	-\$230,404	\$0	\$391,451

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.17. Action 3 (recreational aggregate grouper bag limit), difference from preferred alternative (Alternative 3), charter angler trips.				
	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	-14,036	-8,241	0	10,553
Angler trips affected by the aggregate closed seuon	0	0	0	0
Reduction in fish kept	-25,674	-16,391	0	28,020
Reduction in value	-\$106,290	-\$67,859	\$0	\$116,004
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	-24,195	-17,786	0	11,155
Angler trips affected by the aggregate closed seuon	0	0	0	0
Reduction in fish kept	-42,122	-28,257	0	47,579
Reduction in value	-\$174,253	-\$116,854	\$0	\$196,188

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.18. Action 3 (recreational aggregate grouper bag limit), difference from preferred alternative (Alternative 3), private angler trips.				
	2003			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	-9,974	-7,115	0	36,853
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	-14,500	-9,488	0	34,770
Reduction in value	-\$60,028	-\$39,279	\$0	\$143,947
	2004			
	Alt 1	Alt 2	Alt 3	Alt 4
Angler trips affected by the red grouper minimum size limit	0	0	0	0
Angler trips affected by the red grouper bag limit	0	0	0	0
Angler trips affected by the red grouper vessel limit	0	0	0	0
Angler trips affected by the aggregate grouper bag limit	-23,076	-8,044	0	33,404
Angler trips affected by the aggregate closed season	0	0	0	0
Reduction in fish kept	-48,480	-27,428	0	47,165
Reduction in value	-\$200,706	-\$113,551	\$0	\$195,263

Alt 1 = status quo/no action

Alt 2 = 4-fish aggregate grouper bag limit

Alt 3 = 3-fish aggregate grouper bag limit

Alt 4 = 2-fish aggregate grouper bag limit

Table 7.3.19. Estimated potential foregone expenditures (millions, 2005\$) due to trip cancellation during seasonal closures (Action 1).

		2003		
		Alt 4		Alt 5
		4a	4b	
Private/rental trips		\$38.72	\$48.74	\$22.30
Charterboat trips		\$58.39	\$123.37	\$16.02
Total		\$97.11	\$172.11	\$38.33
		2004		
		Alt 4		Alt 5
		4a	4b	
Private/rental trips		\$57.71	\$74.58	\$24.88
Charterboat trips		\$47.69	\$136.95	\$17.39
Total		\$105.40	\$211.53	\$42.27
		Average		
		Alt 4		Alt 5
		4a	4b	
Private/rental trips		\$48.21	\$61.66	\$23.59
Charterboat trips		\$53.04	\$130.16	\$16.71
Total		\$101.25	\$191.82	\$40.30

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

Table 7.3.20. Estimated potential foregone for-hire fees (millions, 2005\$) due to trip cancellation during seasonal closures (Action 1).

	Alt 4		Alt 5
	4a	4b	
	2003	\$8.82	\$18.63
2004	\$7.20	\$20.68	\$2.63
Average	\$8.01	\$19.66	\$2.52

Alt 4a = 1-fish red grouper bag limit and an August closure for all grouper

Alt 4b = 1-fish red grouper bag limit and a April-May closure for all grouper

Alt 5 = 1-fish red grouper bag limit and a closure for red grouper, gag and black grouper from February 15-March 15

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14 ALTERNATIVES CONSIDERED BUT REJECTED

Red Grouper Annual TAC for 2006 through 2008

Alternative 1. Status quo/no action. Retain the red grouper TAC at 6.56 mp gutted weight until the next stock assessment is completed; the commercial red grouper quota is 5.31 mp gutted weight, commercial shallow-water grouper quota is 8.80 mp gutted weight, and recreational red grouper allocation is 1.25 mp gutted weight.

Alternative 2. Increase the red grouper TAC in 2006 to the constant catch rebuilding level of 7.03 mp gutted weight; the commercial red grouper quota is 5.69 mp gutted weight, commercial shallow-water grouper quota is 9.18 mp gutted weight, and recreational red grouper allocation is 1.34 mp gutted weight. In 2007, increase the red grouper TAC to 7.23 mp gutted weight (the commercial red grouper quota is 5.86 mp gutted weight, commercial shallow-water grouper quota is 9.35 mp gutted weight, and recreational red grouper allocation is 1.37 mp gutted weight) contingent upon completion of a red grouper stock assessment that shows such TAC is consistent with the red grouper rebuilding plan.

Alternative 3. Increase the red grouper TAC in 2006 to 7.23 mp gutted weight; the commercial red grouper quota is 5.86 mp gutted weight, commercial shallow-water grouper quota is 9.35 mp gutted weight, and recreational red grouper allocation is 1.37 mp gutted weight..

Discussion: Secretarial Amendment 1 stipulates that any new ABC (TAC) will be set following a future stock assessment. A new assessment is scheduled for completion in fall/winter 2006. Following that assessment, higher TAC may be warranted if it can be shown that such harvest does not exceed the constant F targets that can rebuild the stock by 2012. However, until then a rebuilding plan has been established to end overfishing and rebuild the stock within a specified time period (ten years in this case) but overfishing continues and the M-SFCMA states that “ If the Secretary finds as a result of review that such plan, amendment or regulations have not resulted in adequate progress toward ending overfishing and rebuilding affected fish stocks, the Secretary shall—(B) ... immediately notify the appropriate Council. Such notification shall recommend further conservation and management measures which the Council should consider

under paragraph (3) to achieve adequate progress.”[Section 304 (e) (7) (B)]. Paragraph (3) contains the language to prepare plans, amendments, or management measures to end overfishing within one year [Section 304 (e) (3)]. Without new evidence that the stock has improved faster than expected and overfishing is no longer occurring, it is not justifiable to increase TAC at this time.

Recreational Red Grouper Size Limits

Alternative 2. Decrease the red grouper recreational size limit to 18 inches TL.

Alternative 3. Decrease the red grouper recreational size limit to 19 inches TL.

Discussion: The 20-inch TL minimum size for recreational red grouper was implemented through Amendment 1 to the Reef Fish FMP in 1990. Fifty percent sexual maturity occurs at 20 inches TL. Measured lengths from the SEFSC Headboat Survey and from the MRFSS for the period prior to 1990 (1986 – 1989) were used to estimate the effect of decreasing the recreational size limit to either 19 or 18 inches. The combined estimate of newly available fish was 18 percent if the size limit is reduced to 19 inches and 33 percent if the size limit is reduced to 18 inches TL (Table 4). These values are likely to be minimal estimates of newly available fish because there was no size limit in federal waters and an 18 inches TL size limit in Florida state waters during this time period. Typically, size classes just below legal size are much more abundant than are the size classes that are fished. The modal size of fish landed during this time was 15 inches TL and fish less than 14 inches TL were routinely landed. The more recent size frequency data (2002-2004) where the minimum size limit is 20 inches TL would provide a better estimate of the effect of decreasing the size limit if relative availability of sub-legally sized fish could be estimated. A crude approximation of the recent relative availability of 18 and 19 inch TL fish can be generated by regressing numbers of legally-sized fish measured by size and predicting the relative abundance of sub-legally-sized fish. Doing this for 2002-2004 MRFSS data suggests numbers of newly available fish might be nearly twice the amount estimated from the 1986 to 1989 data; however, this method may overestimate the available fish.

Table 4. Proportional increase or decrease in availability of legal-sized fish with changes in minimum size				
Minimum Size	Headboat	Charter	Private	Combined
18"	22.26%	44.77%	39.58%	32.55%
19"	12.69%	27.01%	21.44%	17.98%

NOTE: 86-89 length data used for 19" and 18" minimum sizes.