

REGULATORY AMENDMENT

TO THE

REEF FISH FISHERY MANAGEMENT PLAN

TO ADJUST RED SNAPPER LANDING PROVISIONS

AND SET STARTING DATE FOR THE 1994

RED SNAPPER FISHING SEASON

*(Includes Environmental Assessment,
and Regulatory Impact Review)*

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Table of Contents

1. HISTORY OF MANAGEMENT	1
2. PURPOSE AND NEED FOR ACTION	4
3. PROPOSED ACTIONS	5
4. STATUS OF STOCKS	5
4.1 Red Snapper	5
4.2 Red Grouper / Gag / Shallow Water Grouper	6
5. MANAGEMENT ALTERNATIVES AND REGULATORY IMPACT REVIEW	8
5.1 Introduction	8
5.2 Proposed Action	8
5.3 Rejected Alternatives	12
5.4 Private and Public Costs	14
5.5 Summary of Regulatory Impacts	14
5.6 Determination of a Major Rule	15
5.7 Determination of Significant Economic Impact on a Substantial Number of Small Entities.	15
6. ENVIRONMENTAL ASSESSMENT	17
6.1 Environmental Consequences	17
6.2 Finding of No Significant Environmental Impact	18
7. OTHER APPLICABLE LAW	19
7.1 Habitat Concerns	19
7.2 Vessel Safety Considerations	19
7.3 Coastal Zone Consistency	19
7.4 Paperwork Reduction Act	19
7.5 Federalism	19
8. PUBLIC REVIEW	21
9. REFERENCES	22

Abbreviations Used in This Document

OY	Optimum Yield
Plan	Reef Fish FMP for the Gulf of Mexico
RD	Regional Director (NMFS Southeast Regional Office)
RFSAP	Reef Fish Scientific Assessment Panel
SEFC	Southeast Fisheries Center, Miami, Florida (NMFS Southeast Regional Office)
SPR	Spawning Potential Ratio
TAC	Total Allowable Catch
TED	Turtle Excluder Device
YPR	Yield Per Recruit

1. HISTORY OF MANAGEMENT

The Reef Fish Fishery Management Plan was implemented in November 1984. The regulations, designed to rebuild declining reef fish stocks, included: (1) prohibitions on the use of fish traps, roller trawls, and powerhead-equipped spear guns within an inshore stressed area; (2) a minimum size limit of 13 inches total length for red snapper with the exceptions that for-hire boats were exempted until 1987 and each angler could keep 5 undersize fish; and, (3) data reporting requirements.

The National Marine Fisheries Service (NMFS) has collected commercial landings data since the early 1950's, recreational harvest data since 1979, and in 1984 initiated a dockside interview program to collect more detailed data on commercial harvest. The first red snapper assessment in 1988 indicated that red snapper was significantly overfished and that reductions in fishing mortality rates of as much as 60 to 70 percent were necessary to rebuild red snapper to a recommended 20 percent spawning stock potential ratio (SPR - See Section 5 below). The 1988 assessment also identified shrimp trawl bycatch as a significant source of mortality.

Amendment 1 to the Reef Fish Fishery Management Plan, implemented in 1990, set as a primary objective of the FMP the stabilization of long term population levels of all reef fish species by establishing a survival rate of biomass into the stock of spawning age to achieve at least 20 percent spawning stock biomass per recruit (SSBR), relative to the SSBR that would occur with no fishing. It set a red snapper 7 fish recreational bag limit and 3.1 million pound commercial quota that together were to reduce fishing mortality by 20 percent and begin a rebuilding program for that stock. This amendment also established a 5 fish recreational bag limit and 11.0 million pound commercial quota¹ for groupers, with the commercial quota subdivided into a 9.2 million pound shallow-water quota and a 1.8 million pound deep-water quota. A framework procedure for specification of TAC was created to allow for annual management changes, and a target date for achieving the 20 percent SSBR goal was set at January 1, 2000. This amendment also established a longline and buoy gear boundary 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. shark) was limited to the recreational bag limit. Subsequent changes to the longline/buoy boundary could be made through the framework procedure for specification of TAC.

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

In November, 1990, NMFS announced that anyone entering the commercial reef fish fishery in the Gulf of Mexico and South Atlantic after a control date of November 1, 1990 may not be assured of future access to the reef fish fishery if a management regime is developed and implemented that limits the number of participants in the fishery. The purpose of this announcement was to establish a public awareness of potential eligibility criteria for future access to the reef fish resource, and does not prevent any other date for eligibility or other method for controlling fishing effort from being proposed and implemented.

At the direction of the Council, the Reef Fish Scientific Assessment Panel (RFSAP) met in March 1990 and reviewed the 1990 NMFS Red Snapper Stock Assessment. The recommendation of the panel at that time was to close the directed fishery because the Allowable Biological Catch (ABC) was being harvested as bycatch of the shrimp trawl fishery. No viable alternatives were identified that would achieve the 20 percent SPR goal by the year 2000 without closure of the directed fishery; because no means existed for reducing trawl bycatch. As a result, Amendment 3, implemented in July 1991, provided additional flexibility in the annual framework procedure for specifying TAC by allowing the target date for rebuilding an overfished stock to be changed depending on changes in scientific advice, except that the rebuilding period cannot exceed 1.5 times the generation time of the species under consideration. It revised the FMP's primary objective, definitions of optimum yield and overfishing and framework procedure for TAC by replacing the 20 percent SSBR target with

¹ These values have been subsequently modified to correct for revisions adopted in the gutted to whole weight ratio. Historically, the conversion ratio used was 1.18, subsequently, the ratio has been corrected and 1.05 is used. This results in these values being 9.8, 8.2 and 1.6 million pounds respectively, for total, shallow-water and deep-water grouper quotas (e.g., $11.0 \div 1.18 \times 1.05 = 9.8$). There is no impact on the commercial fishery from the revision as fish have always been reported in gutted weight and that data is transformed to whole weight for NMFS records.

20 percent spawning potential ratio (SPR). The amendment also transferred speckled hind from the shallow-water grouper quota category to the deep-water grouper quota category and established a new red snapper target year of 2007 for achieving the 20 percent SPR goal.

During 1991 several regulatory amendments were implemented to adjust the TACs and quotas for reef fish:

A 1991 regulatory amendment raised the 1991 quota for shallow-water groupers to 9.9² million pounds. This action was taken to provide the commercial fishery an opportunity to harvest 0.7 million pounds that went unharvested in 1990 due to an early closure of the fishery in 1990. NMFS had projected the 9.2 million pound quota to be reached on November 7, but subsequent data showed that the actual harvest was 8.5 million pounds.

A 1991 regulatory amendment set the red snapper TAC at 4.0 million pounds to be allocated with a commercial quota of 2.04 million pounds and a 7 fish recreational daily bag limit (1.96 million pound allocation) beginning in 1991. This amendment also contained a proposal by the Council to effect a 50 percent reduction of red snapper bycatch in 1994 by the offshore EEZ shrimp trawler fleet, to occur through the mandatory use of finfish excluder devices on shrimp trawls, reductions in fishing effort, area or season closures of the shrimp fishery, or a combination of these actions. This combination of measures was projected to achieve a 20 percent SPR by the year 2007. The 2.04 million pound quota was reached on August 24, 1991, and the red snapper fishery was closed to further commercial harvest in the EEZ for the remainder of the year. In 1992, the commercial red snapper quota remained at 2.04 million pounds. However, extremely heavy harvest rates resulted in the quota being filled in just 53 days, and the commercial red snapper fishery was closed on February 22, 1992.

A 1991 regulatory amendment set the 1992 commercial quota for shallow-water groupers at 9.8 million pounds, which was 1.6 million pounds higher than the adjusted 1991 base level quota of 8.2 million pounds.

An emergency rule, implemented in 1992 by NMFS at the request of the Council, reopened the red snapper fishery from April 3, 1992 through May 14, 1992 with a 1,000 pound trip limit. This rule was implemented to alleviate economic and social upheavals that occurred as a result of the 1992 red snapper commercial quota being rapidly filled. Although this emergency rule resulted in a quota overrun of approximately 600,000 pounds, analysis by NMFS biologists determined that this one time overrun would not prevent the red snapper stock from attaining its target SPR.

Amendment 4, implemented in May 1992, established a moratorium on the issuance of new reef fish permits for a maximum period of three years. The moratorium was created to moderate short term future increases in fishing effort and to attempt to stabilize fishing mortality while the Council considers a more comprehensive effort limitation program. It allows the transfer of permits between vessels owned by the permittee or between individuals when the permitted vessel is transferred. Amendment 4 also changed the time of the year that TAC is specified from April to August and included additional species in the reef fish management unit.

Proposed Amendment 5 (currently under review) will establish restrictions on the use of fish traps in the Gulf of Mexico EEZ, implement a three year moratorium on the issuance of new fish trap permits and make existing permits non-transferable during the moratorium, create special management zones (SMZ's) with gear restrictions off the Alabama coast, create a framework procedure for establishing future SMZ's for artificial reefs where gear may be restricted, require that all finfish except for oceanic migratory species be landed with head and fins attached, gradually raise the minimum size limit for red snapper to 16 inches over a period of five years, and close the region of Riley's Hump (near Dry Tortugas, Florida) to all fishing during May and June to protect mutton snapper spawning aggregations.

² The corrected 1991 quota, using the revised conversion factor, was 8.8 million pounds. The corrected 1990 actual harvest was 7.6 million pounds.

A 1992 Regulatory Amendment set the 1993 red snapper TAC at 6.0 million pounds to be allocated with a commercial quota of 3.06 million pounds and a recreational allocation of 2.94 million pounds (to be implemented by a 7 fish recreational daily bag limit). The amendment also changed the target year to achieve a 20 percent red snapper SPR from 2007 to 2009, based on the Plan provision that the rebuilding period may be for a time span not exceeding 1.5 times the potential generation time of the stock and an estimated red snapper generation time of 13 years (Goodyear 1992).

An Emergency Rule effective December 30, 1992 created a red snapper endorsement to the reef fish permit for the start of the 1993 season. The endorsement was issued to owners or operators of federally permitted reef fish vessels who had annual landings of at least 5,000 pounds of red snapper in two of the three years from 1990 through 1992. For the duration of the emergency rule, while the commercial red snapper fishery is open permittees with red snapper endorsements are allowed a 2,000 pound possession limit of red snapper, and permittees without the endorsement are allowed 200 pounds. This emergency action was initially effective for 90 days, and was extended for an additional 90 days with the concurrence of NMFS and the Council. A related emergency rule delayed the opening of the 1993 commercial red snapper season until February 16 to allow time for NMFS to process and issue the endorsements. *Note: A legal challenge to the red snapper endorsement emergency rule was filed in U.S. District Court, Corpus Christi, Texas on January 21, 1993. The outcome of this challenge has not been determined as of the writing of this draft.*

Amendment 6, implemented in June, 1993, extended the provisions of the emergency rule for red snapper endorsements for the remainder of 1993 and 1994, unless replaced sooner by a comprehensive effort limitation program. In addition, it allowed the trip limits for qualifying and non-qualifying permittees to be changed under the framework procedure for specification of TAC.

Proposed Amendment 7 (currently under review) will establish reef fish dealer permitting and record keeping requirements, allow transfer of fish trap permits and endorsements between immediate family members during the (Amendment 5 proposal for) fish trap permit moratorium, and allow transfer of other reef fish permits or endorsements in the event of the death or disability of the person who was the qualifier for the permit or endorsement.

A proposed 1993 Regulatory Amendment (currently under review) would move the longline and buoy gear restricted area boundary off central and south-central Florida inshore from the 20 fathom isobath to the 15 fathom isobath for a one-year period beginning January 1, 1994, as an experimental fishery during which time studies will be planned and carried out to examine the biological, social and economic impacts of that action. This action was proposed in response to requests from longline fishermen for increased access to areas with suitable grouper habitat, and in consideration of a red grouper stock assessment which indicated that species was not overfished and that the commercial quota had never been filled.

2. PURPOSE AND NEED FOR ACTION

In September 1993, the Council reviewed updated stock assessments for red grouper (as an index for shallow water grouper) and red snapper for purposes of setting the 1994 TAC for these species. For shallow water grouper, the Council chose to retain the status quo TAC of 15.1 million pounds, allocated 65 percent commercial (9.8 million pounds) and 35 percent recreational (5.3 million pounds through a five-fish daily bag limit). For red snapper, the Council also chose to retain the status quo TAC of 6 million pounds, allocated 51 percent commercial (3.06 million pounds) and 49 percent recreational (2.94 million pounds). The red snapper recreational allocation will continue to be implemented through a seven fish per person bag limit. The commercial allocation will continue to be implemented through a quota and through the two tier endorsement and trip limit system established in Amendment 6, i.e., commercially permitted reef fish vessels with a red snapper endorsement will be allowed a 2,000 pound trip limit, and permitted vessels without a red snapper endorsement will be allowed a 200 pound trip limit.

The red snapper trip limits were implemented to slow down the rate of red snapper harvest and spread out the season. However, the implementing regulations defined trip limits only as possession limits and not as daily

landing limits. As a result, some fishermen were able to make multiple daily landings of trip limits in 1993. Allowing multiple daily trip limit landings reduces the effectiveness of the trip limits to spread out the season.

In 1993, the red snapper season was closed by emergency action from January 1 until February 16 in order to give NMFS time to review red snapper endorsement applications and distribute the endorsements to qualifying permit holders. This closure also allowed fishermen to avoid having to fish during the early weeks of the year, which are frequently periods of bad weather, yet allowed the season to open in time to harvest fish for Lenten season. The 1994 season will open on January 1 unless action is taken to delay the opening. However, if the opening date is set to accommodate Lenten season, it needs to be set each year because Lent begins on a different date each year. In 1994, Lent begins on February 16.

3. PROPOSED ACTIONS

The Council proposes that the red snapper trip limits be daily landing limits as well as at sea possession limits, that it be a violation for a dealer to buy or attempt to buy more than one trip limit per day from a fisherman, and that it be a violation for a fisherman to sell or attempt to sell more than one trip limit per day.

The Council also proposes to delay the opening of the 1994 commercial red snapper season until February 10.

4. STATUS OF STOCKS

4.1 Red Snapper

The last full red snapper stock assessment was completed in 1992 and was reviewed in the regulatory amendment for setting the 1993 red snapper TAC (GMFMC 1992a). Data on commercial and recreational harvest trends and recruitment indices for 1991 and 1992 were updated in 1993 (Goodyear 1993). The following summary is based on Goodyear (1993) and the 1993 Stock Assessment Panel report (GMFMC 1993).

Harvest Trends: The estimated recreational harvest for 1992 was 2.7 million pounds and the commercial harvest was 3.1 million pounds. Both sectors exceeded their respective 1992 allocations which were 1.96 million pounds recreational and 2.04 million pounds commercial. The preliminary estimate of 1993 commercial harvest was 3.2 million pounds; no estimate is available for 1993 recreational landings. The 1993 allocations were 3.06 million pounds for the commercial sector and 2.94 million pounds for the recreational sector. The commercial allocation is being implemented through a size limit, a quota and a two tier trip limits. The recreational allocation is being implemented through a size limit and bag limits. About half the recreational catch is currently being released. The framework procedure allowed harvest in excess of TAC for 1990-1992 but if the allocations continue in future years subsequent annual allocations may have to be reduced to sustain the recovery program.

Recruitment Indices: Juvenile abundance estimates from the Summer SEAMAP and Fall Groundfish Survey show a general decline between the 1970s and 1980s with the lowest values occurring with the 1985 year class. Most recent years have had poor recruitment compared to the 1970s. However, the 1989 year class was the strongest seen in eight years and more than 4.4 times greater than the average of the previous five years. Members of this year class began to recruit to the fishery late in 1991 and most were of legal size by January 1992. The three subsequent year classes (1990-1992) averaged about 37 percent of the 1989 year class.

Spawning Potential Ratio: Estimates of the spawning potential ratio increased from less than 1 percent in 1984 to slightly above 1 percent by 1992. The conservation measures currently in place are enhancing the condition of the stock. However, without the planned permanent reduction of 50 percent in the shrimp bycatch mortality rate in the near future, it will not be possible to attain to spawning stock goals of the Plan by the target date of 2009. At a 6 million pound TAC, if the bycatch reduction occurs early in 1994 the probability of achieving the 2009 goal is better than 95 percent. If delayed until 1995 or 1996 the probability drops to about 90 percent and 70 percent respectively, and if delayed to 1997 the probability drops to 25 percent. Alternatively, if the

bycatch reduction can be gradually implemented in four equal steps beginning in 1994, the probability of attaining the 2009 goal is approximately 80 percent.

Red Snapper ABC Range and TAC: The range of Allowable Biological Catch for red snapper remains at 4 to 6 million pounds. The most uncertain aspect of future management is the magnitude and implementation date for shrimp trawl bycatch mortality rate reduction measures. The SPR forecasts for various combinations of TAC and shrimp trawl bycatch reduction are presented in **figures 1 to 8**. For 1994, the Council took no action to change the red snapper TAC, and it will remain at the status quo of 6 million pounds.

4.2 Red Grouper / Gag / Shallow Water Grouper

A red grouper stock assessment was prepared in 1993 (Goodyear and Schirripa 1993) and updates the previous red grouper assessment prepared in 1991. In addition, a literature review of available gag data was prepared (Eklund 1993). The shallow water grouper complex consists of all Gulf of Mexico grouper species in the fishery except for the deep water grouper (misty, snowy, yellowedge, warsaw and speckled hind) and jewfish, which is prohibited for harvest. Red grouper are the predominant species in the shallow water grouper fishery, and are used as an index for setting the shallow water grouper ABC range and TAC.

Note: Small amounts of marbled grouper landings have been reported from Louisiana (1 to 8 thousand pounds gutted per year from 1986 to 1991, 34 thousand pounds gutted in 1992). This species is not listed in the Reef Fish FMP.

Red Grouper Harvest Trends: Red grouper harvested by U.S. fishermen are primarily caught in the eastern Gulf from Panama City, Florida to the Florida Keys. They are the most common species in the commercial and recreational grouper catch of the U.S. Gulf of Mexico. Red grouper accounted for nearly two thirds of the total commercial catch since 1986, and contributed about 7½ million pounds in 1989. If the proportion of red grouper in the total grouper catch was the same prior to 1986, when grouper were first separated by species in the landings, then peak U.S. commercial harvest for this species was about 8½ million pounds in 1982. In the 1950's, when Cuban fishermen harvested red grouper off Florida waters, total commercial catches peaked at about 12 million pounds. Red grouper commercial landings since 1986 have varied between 4.3 million pounds (in 1992) and 7.5 million pounds (in 1989) gutted weight³. Estimated recreational harvest of red grouper since 1979 has varied between 177 thousand fish weighing 0.7 million pounds (in 1980) gutted weight and 1.2 million fish weighing 4.8 million pounds (in 1984) gutted weight. The regulations that became effective in 1990 (20 inch size limit, 5 shallow water grouper bag limit, and commercial quota) caused a 70 percent decline in the recreational harvest by number and a 41 percent decline by weight from the average of the prior two years. Commercial harvest declined by 21 percent from the prior two years. In 1992, the commercial fishery landed 4.3 million pounds gutted weight of red grouper, while the recreational fishery landed an estimated 456 thousand fish weighing 2.9 million pounds gutted weight. Total combined weight of red grouper caught in 1992 is 7.6 million pounds whole weight.

Red Grouper Spawning Potential Ratio: Analysis of the age and growth has revealed that red grouper have increased their rate of growth in recent years. In addition, the recent implementation of a 20 inch minimum size limit has shifted the distribution of fishing mortality from younger fish toward older fish. Consequently, the red grouper resource is not in equilibrium. SPR for conditions existing in 1989 is estimated to be 17 percent to 24 percent, and is currently slightly above that. Once the red grouper stock reaches equilibrium, the equilibrium SPR is projected to be between 21 percent and 30 percent depending upon the assumed level of release mortality and whether harvest remains at current levels or increases to fill the TAC (**Table 1**).

Note: the previous stock assessment (Goodyear and Schirripa 1991) did not contain SPR estimates for existing conditions. Equilibrium SPR estimates assuming current fishing mortality rate and a 33 percent release

³ The red grouper stock assessment used gutted weights. However, ABC and TAC are based on whole weights. The conversion factor from gutted to whole weight is: Whole weight = 1.05 * Gutted weight.

mortality was previously estimated to be 36 percent (GMFMC 1991). Based on the 1993 stock assessment, the equilibrium SPR assuming current fishing mortality rate and a 33 percent release mortality is now estimated to be 30 percent (GMFMC 1993 and **Table 1**). This reduction in the equilibrium SPR estimate is due primarily to the impact of including the new growth rate analysis in the 1993 stock assessment.

Gag: Concern about the status of gag stocks in the Gulf of Mexico has arisen due to possible changes in the population structure. Studies by Koenig have indicated that, while in the 1970's males comprised 14 to 15 percent of the commercial catch, in recent years males have only comprised 1.7 to 1.9 percent of the catch. Gag are the second most commonly caught species in the shallow water grouper complex, after red grouper. The Gulf of Mexico Fishery Management Council has requested that a gag stock assessment be prepared in 1994. Eklund (1993) has identified four basic problems that need to be addressed in preparing the gag stock assessment. These are:

1. Misidentification of gag as black grouper,
2. Growth rates within the population may have changed over time,
3. Possible changes in sex ratio over time caused by fishing on spawning aggregations, and
4. Effect of release mortality.

Shallow Water Grouper ABC Range and TAC: The TACs shown in **Table 1** are for red grouper alone. Red grouper comprised 61.5 percent of shallow water grouper landings for the period 1986 to 1991. Based on this percentage, **Table 2** shows the TACs expanded to include all shallow water grouper, as well as show the commercial and recreational allocations. The lower end of the ABC range is the TAC associated with a red grouper fishing mortality rate that corresponds to $F_{0.1}$. At the existing 20 inch minimum size limit, this is 6.7 million pounds (4.4 million pound commercial quota) if release mortality is 50 percent, or 7.2 million pounds (4.7 million pound commercial quota) if release mortality is 33 percent. The upper end of the ABC range is the TAC that would result in a red grouper equilibrium SPR of 20 percent. This is estimated to be about 16 million pounds (10.4 million pound commercial quota). Thus, the shallow water ABC range is 6.7 to 16.0 million pounds. The Reef Fish Stock Assessment Panel noted that the red grouper fishery is not overfished, and suggested that for stocks that are not overfished a TAC corresponding to the 20 percent SPR level may not optimize yield, economics or social benefits. The existing shallow water TAC of 15.1 million pounds (9.8 million pound quota) and 20 inch size limit is within the ABC range. The Council took no action to change the shallow water grouper TAC, and it will therefore remain at the status quo.

5. MANAGEMENT ALTERNATIVES AND REGULATORY IMPACT REVIEW

5.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action, 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem, and 3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed regulations are major under criteria provided in Executive Order 12291 and whether the proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act of 1980 (RFA). The primary purpose of the RFA is to relieve small businesses, small organizations, and small governmental jurisdictions (collectively: "small entities") of burdensome regulatory and recordkeeping requirements. The RFA requires that if regulatory and recordkeeping requirements are not burdensome, then the head of a Federal agency must certify that the requirement, if promulgated, will not have a significant effect on a substantial number of small entities.

This RIR analyzes the probable effects on fishery participants of the proposed regulatory amendment to the reef fish FMP (Fishery Management Plan). The proposed set of management measures is expected to directly affect only the commercial sector of the red snapper fishery, so the discussion in this RIR focuses on this sector of the fishery.

In this document, the "Socioeconomic Impacts" statements under each of the management options comprise the bulk of the RIR. The problems and objectives are described in previous sections of the regulatory document as a part of the RIR by reference.

5.2 Proposed Action

Define red snapper commercial trip limits as daily landing limits as well as at sea possession limits. It is a violation for a dealer to buy or attempt to buy more than one trip limit per day from a fisherman, and it is a violation for a fisherman to sell or attempt to sell more than one trip limit per day.

Delay the opening of the 1994 commercial red snapper fishing season until February 10, 1994.

Rationale: Multiple daily landings of red snapper reduce the effectiveness and enforceability of vessel trip limits. Multiple landings may occur when a vessel is close enough to the resource and fast enough to make more than one trip in a day. "Paper" multiple landings may occur if a vessel lands in excess of its trip limit but reports the landing as a series of same day landings, with each reported landing not exceeding the vessel's trip limit. During 1993, logbook records indicate that about ten percent of vessels landing red snapper reported multiple landings on at least one day. Of these, vessels operating under a 200 pound trip limit outnumbered vessels operating under a 2,000 pound trip limit by about 2 to 1. Most of the reported multiple landing occurrences involved two landings per day, although some vessels reported up to four landings.

Winter months are frequently a time of bad weather, which can make fishing hazardous. Because of the expectation that the red snapper quota will be quickly filled, fishermen may feel compelled to fish even under hazardous weather conditions in order to catch their share of the resource. Delaying the opening of the commercial red snapper season reduces the likelihood of encountering bad weather, and also extends the quota closure date until later in the year. However, Lent, which occurs in late February or March, is a time of increased demand for seafood, and it is desirable to have the red snapper season open in time for this season.

In 1994, Lent begins on February 16. Opening the season on February 10 will allow the industry time to harvest red snapper.

Biological Impacts: Since the commercial harvest is regulated by a quota closure, the prohibition on multiple daily landings by a vessel will not change the annual fishing mortality rate, although it may slow down harvest and extend the season. Once fishing vessels have caught their trip limit, fishing pressure on alternative species, such as vermilion snapper, may increase. Release mortality of red snapper caught in excess of the trip limit may increase if fisherman are unable to avoid catching red snapper while targeting other species. Overall, any biological impacts will be minor, since only a small portion of those vessels landing red snapper reported multiple daily landings in 1993. However, this regulation will prevent the practice from expanding in future years.

Delaying the opening of the season will allow some fish a chance for additional growth before being caught, but this increased growth is minor. Between the beginning of January and the beginning of February, red snapper that are age 9 or younger will increase in length by an average of 0.1 to 0.2 inches and will increase in weight by approximately 0.1 pounds (Goodyear 1992).

Socioeconomic Impacts: The 1994 TAC for red snapper remains at 6 MP (million pounds), which is same as that of last year. With the same commercial/recreational allocation of the red snapper TAC, the 1994 commercial quota and recreational allocation remain at 3.06 MP and 2.94 MP respectively. The recreational allocation will continue to be fished under a 7-fish bag limit with no closure. The commercial quota will continue to be fished under an endorsement system whereby permitted vessels with endorsement are allowed

a 2,000-pound trip limit and permitted vessels without endorsement, 200-pound trip limit; the fishery closes upon reaching the quota. TAC overruns in one year may be taken off from future commercial and/or recreational allocations in terms of reduced commercial quota and lower recreational bag limit.

The Proposed Action does not change any regulation affecting the recreational sector, but does effect three changes on regulations governing the commercial sector. The most important of these changes is the requirement that the harvest limits under the endorsement system be considered daily landing limits and at sea possession limits rather than mere trip limits. The second change is an explicit statement that it is a violation for a fisherman to sell or attempt to sell and for the dealer to buy or attempt to buy (from the same fisherman) red snapper more than the subject fisherman's daily trip limit. The third change would make the fishing season start on February 10 instead of January 1 (as specified in the FMP as amended).

The immediate outcome of the first two changes under the Proposed Action is the elimination of multiple landings in one day by anyone permitted (with or without endorsement) vessel. Such outcome may be seen from the standpoint of its impacts on the vessels directly and indirectly affected by the measure, on the length of the red snapper season, and on the enforcement of the trip limit rules.

The change in trip limit provision would eliminate both "paper" and "real" multiple landings, particularly when coupled with the explicit provision that it is a violation for both the fishermen and dealers to transact business relating to amounts in excess of daily trip limit. Multiple paper landings are taken to refer to reported landings that do not come from separate trips while real multiple landings are those that come from separate trips. Logbook data for 1993 indicate that 538 vessels reported red snapper landings. Of the 131 vessels with red snapper endorsements, about 13 vessels did not have logbooks indicating red snapper landings in 1993 although this could be due to incomplete logbook reports used for this analysis. Of the 538 vessels with red snapper landings, 66 reported at least one day with multiple landings, and 21 of these 66 vessels have endorsements. Only in few instances did multiple landings exceed two per day, and with only one exception these landings were made by vessels without the endorsement. On the basis then of the 1993 logbook records, about 66 vessels would be directly affected by the proposed measure. A mere examination of logbook records, however, does not reveal which of the 66 vessels made real as against paper multiple landings.

Elimination of multiple landings per day would affect the efficiency of the mentioned 66 vessels in about the same manner regardless of the type of multiple landings those vessels made. Elimination of paper landings would tend to increase the total average cost of subject vessels without a compensating increase in revenues. If these vessels make the same number of trips in 1994 their total fishing cost (in real terms) will be about the same but their revenues will decrease since fish caught in excess of the maximum allowed per trip will have to be discarded. These vessels can reduce fishing cost by spending less time for fishing, but such cost reduction may still be expected to be less than the reduction in catch. If these vessels instead adopt the objective of maintaining about the same catch and/or revenues, they will be expected to increase their number of trips but their fishing costs will also increase. Given the same commercial quota and about the same number of vessels fishing for red snapper in 1994, it is very unlikely that such an increase in fishing trips could compensate for the revenue loss due to the elimination of multiple landings. Profitability then of these vessels may be expected to decrease under the proposed measure.

In the same vein, elimination of real multiple landings would tend to decrease the total revenue of subject vessels mainly because of lower total landings. While these vessels can recoup later part of their forgone harvest, most of those forgone harvest would likely be taken by other vessels. While it is true that with fewer trips these vessels' total cost would be reduced, the fact they did take multiple trips in a single day indicates that increases in fishing costs were less than increases in revenues. Although it is not exactly the case that a symmetric effect will occur if their number of trips is reduced, there is good reason to believe that on balance fewer trips for these vessels would mean more than proportionate reduction in revenues relative to cost. These vessels' profitability would then be expected to decrease under the proposed measure.

Logbook data reveal that if vessels with multiple landings were allowed only one landing per day, they would have to give up about 110 thousand pounds, or about 5 percent of total landings recorded in the logbooks. Applying the same percentage to the entire commercial quota of 3.06 MP, about 150 thousand pounds would be given up by vessels with multiple landings. Part of this amount would be taken by the same vessels if they

decided to take additional trips, although it is likely that a large portion of this amount would be harvested by other vessels that would undertake additional trips. While additional trips mean additional fishing costs, there is a good likelihood that these other vessels would generate more than cost offsetting revenues from additional catch partly due to the possibility of more favorable red snapper price from a lengthened season. How favorable this price condition would be depends on how long the season could be extended. Assuming the 1994 fishing effort does not significantly differ from that of last year, the additional fish available for harvest by eliminating multiple landings could most likely be taken in about a week; thus prices would not be significantly different from what would prevail under a relatively shorter season. It appears then that while additional trips by these other vessels would generate additional profits, such profits would not be substantial.

If we sum up the profit changes over all the vessels in the red snapper fishery, it appears that the proposed action would mainly redistribute profits from those that reported multiple landings to other vessels in the fishery. This conclusion, of course, is highly contingent on the assumption of no potential significant effort increase in 1994. If this assumption is dropped, the primary issue becomes one of determining the proposed measure's effects on the length of the season for commercial red snapper fishing. A longer season is deemed to bring about higher economic and social benefits to the commercial user groups and consumers (GMFMC 1992b).

Potential increase in fishing effort could come from those that fished for red snapper in 1993 and those that did not but have reef fish permits with or without endorsement. If effort increases are forthcoming from the latter group of fishermen, the proposed measure will most likely be ineffective in lengthening the season. In this regard, the above described distributional effects on vessel profits would be realized but the distribution will be from those reporting multiple landings to the "new" entrants in the fishery. In addition to this distributional effects, there is a high likelihood that the total profits to the commercial harvest sector will decrease relative to those of last year. If, on the other hand, effort increases come from the first group of fishermen, it is highly likely that the proposed measure will enable a longer season relative to what it would be under the status quo. This is the case since the main avenue for these fishermen to increase their effort would be in the form of making multiple or more trips a day, whether paper or real. In the case of paper multiple trips, increased effort may take the form of more time spent for fishing. Thus, it is in this regard that the proposed measure can be taken to generate economic benefits to the fishing industry. Consumer surpluses could also be enhanced when the fishing season is lengthened or at least prevented from being shortened.

But fuller realization of benefits from the proposed measure depends largely on the effectiveness of enforcing the trip limit rules. Trip limit rules are by nature difficult to enforce, and the occurrence of multiple landings - a rational reaction to trip limits - simply compounded the difficulty of enforcing such rules. The appearance of paper multiple landings has only meant a relatively higher enforcement cost if ever they have to be distinguished from real multiple landings. Outlawing multiple landings of all types would not necessarily eliminate but would definitely lessen the occurrence of paper multiple landings. On this account, the proposed measure to prohibit multiple landings may be deemed to enhance the enforcement of trip limit rules. The additional stipulation that both the fishermen and dealers are liable to be penalized for transactions involving multiple landings could further enhance the enforcement of trip limit rules.

It may be noted, however, that there could be other means of concealing landings above the trip limit. One such way would be to simply declare landings as equal to the maximum allowed. An examination of logbooks shows that it is not uncommon to find landings that exactly matched the maximum of 200 or 2,000 pounds as the case may be. We may hasten to add though that it is possible the reported amount of 200 or 2,000 pounds could be higher than actual catches. This possibility stems from some fishermen attempting to gain "points" at the prospect of the Council adopting some type of access limitation wherein a fisherman's level of participation depends on his historical landings. At any rate, if harvests in excess of the trip limits are successfully concealed by the simple means of reporting only the maximum allowed landings, such practice could potentially prevent adequate assessment of the status of the stock. This latter problem could later translate to less economic benefits to commercial fishermen and even to recreational fishermen fishing red snapper. From an economic efficiency standpoint, such "avoidance" activities only impose a cost on society without any offsetting benefits (Anderson 1987).

Without fishermen cooperation, costs associated with avoidance activities can only be minimized by incurring additional enforcement costs. While such situation may appear to result in no net benefit to society,

enforcement may generate another benefit of its own. Such benefit would be in terms of a fuller realization of the benefits derivable from a management regime, i.e., the endorsement system in the present case for red snapper. The proposed prohibition of multiple landings coupled with explicit statement regarding the liability of both fishermen and dealers when dealing with multiple landings can generate relatively higher benefits only if additional enforcement activities are undertaken to ensure that such avoidance activities as described above would be minimized.

Postponing the opening of the red snapper commercial fishing season from January 1 to February 10 is designed to address fishermen's concern regarding weather-related unfavorable fishing conditions in winter months and the ability to supply red snapper during lenten season when seafood demand is relatively high. Worth noting is the fact that this proposed change does not differ significantly from that of the 1993 season which opened on February 16, so in this regard this proposed change on the start of the season may be regarded to have minimal effects on fishery participants.

5.3 Rejected Alternatives

Rejected Alternative 1: No Action. Retain the red snapper trip limits as possession limits only, and allow the commercial red snapper season to open on January 1, 1994.

Rationale: This would allow fishermen who are able to make multiple trips the flexibility to increase their harvest. However, this could result in a shortened season and the enforceability problems discussed above. January 1 is the start date for the reef fish fishing year as defined in the Amendment 1. Opening the red snapper season on this date would retain consistency with other reef fish fisheries. However, many fishermen would feel compelled to fish under a derby fishery in a time period when there is frequently bad weather. This would favor larger vessels that are better able to operate in rough weather.

Biological Impacts: Total red snapper harvest is regulated by a quota closure and would be unaffected by this measure. Fishing pressure on alternative species would be reduced slightly during the red snapper season, but the length of the red snapper season would also be reduced slightly by the increased harvest rate. Red snapper caught in January will be smaller than if they would be if caught later, but the size differential would be very minor.

Socioeconomic Impacts: The potential effects of the no action alternative regarding trip limit rules depend largely on the potential increase in fishing effort and the source of such effort increase. If fishing effort is not expected to significantly increase, this alternative will only have minimal effects on the fishery participants, and the distributional effects earlier ascribed to the proposed measure will not occur. If effort is expected to increase but the source of such effort increase is the group of fishermen not fishing for red snapper in 1993, both this no action alternative and the proposed measure will have similar effects with respect to the profitability of the commercial harvest sector. If the source of such effort increase is the group of fishermen that fished for red snapper in 1993, benefits accruing to the proposed measure will be forgone as the season becomes shorter.

With respect to the start of the fishing season, this no action alternative is expected to reduce industry profitability relative to the proposed measure since fishing cost will be relatively higher considering the danger posed by fishing in unfavorable weather. There is also a possibility that the industry will not be able to take advantage of higher revenues when the fishery is closed sometime in the middle of the lenten season when seafood demand is relatively higher.

Rejected Alternative 2: Define red snapper commercial trip limits as daily landing limits as well as at sea possession limits. It is a violation for a dealer to buy or attempt to buy more than one trip limit per day from a fisherman, and it is a violation for a fisherman to sell or attempt to sell more than one trip limit per day.

Delay the opening of the 1994 commercial red snapper fishing season until February 15, 1994.

Rationale: This alternative is identical to the proposed action, except that the opening date is February 15 instead of February 10. This opening date is close to the 1993 opening date of February 16. However, in 1994, Lent begins on February 16, and this opening date will not allow red snapper fisherman enough time to harvest fish for the start of Lenten season.

Biological Impacts: Biological impacts are the same as for the proposed action.

Socioeconomic Impacts: This alternative has similar effects as the proposed measure, although in terms of terms of overall industry profitability there could be some difference. It is not possible, however, to determine even qualitatively the significance of such difference.

5.4 Private and Public Costs

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 specific action include:

Council costs of document preparation, meetings, public hearings, and information dissemination.....	\$ 10,000
NMFS administrative costs of document preparation, meetings and review.....	\$ 5,000
Law enforcement costs.....	\$ none
TOTAL.....	\$ 15,000

The Council and Federal costs of document preparation are based on staff time, travel, printing and any other relevant items where funds were expended directly for this specific action. The proposed measures are not expected to incur additional enforcement cost and permit cost to either the public or NMFS.

5.5 Summary of Regulatory Impacts

The potential effects of the Proposed Action regarding trip limit rules depend largely on the potential increase in fishing effort and the source of such effort increase. If fishing effort is not expected to significantly increase, this alternative will result mainly in redistributing profits from those vessels reporting multiple landings to other red snapper vessels. If effort is expected to increase but the source of such effort increase is the group of fishermen not fishing for red snapper in 1993, the proposed measure will have virtually the same effects as the no action alternative relative to the length of the season and the benefits derived from the fishery. If the source of such effort increase is the group of fishermen that fished for red snapper in 1993, the proposed measure is expected to prevent a shortening of the season and thus also prevent a reduction in profits to the harvest sector and in consumer surplus.

The Proposed Action can enhance the enforcement of trip limit rules, although most likely only in terms of eliminating paper multiple landings. Without additional effort, the proposed measure may not be enough to counteract more subtle trip limit violations. To the extent, however, that both the fishermen and the dealers are held explicitly liable for underreporting of catches, the proposed measure may be expected to perform relatively better than the no action alternative in enforcing trip limit rules.

With respect to the start of the fishing season, the Proposed Action may be considered to offer some advantages over the no action alternative in terms of reducing fishing cost and realizing relatively higher revenues to the harvest sector of the red snapper fishery. Under the no action alternative, fishing costs would be relatively

higher when fishermen are compelled to fish in unfavorable weather and revenues would be relatively lower when the fishery is closed in the middle of the lenten season when seafood demand is relatively strong.

Total costs for the preparation of this regulatory action are estimated at \$15,000.

5.6 Determination of a Major Rule

Pursuant to E.O. 12291, a regulation is considered a "major rule" if it is likely to result in: a) an annual effect on the economy of \$100 million or more; b) a major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions; or c) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The proposed measures are not expected to have a \$100 million effect per year on the economy or to cause an increase in the price of red snapper. Also, cost increases to the red snapper industry, commercial and recreational, are not expected. The federal government is not expected to incur any increase in enforcement or in the administration of permits. Any adverse impacts on competition and innovation cannot be associated with the proposed measures, but may arise depending on other measures to be adopted in 1993 or in the future. Employment and investment in the reef fish fishery may be promoted through adoption of the proposed measures. On balance, the proposed measures are not deemed to constitute a "major rule" under any of the mentioned criteria.

5.7 Determination of Significant Economic Impact on a Substantial Number of Small Entities.

Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to relieve small businesses, small organizations, and small governmental entities from burdensome regulations and record keeping requirements. The category of small entities likely to be affected by the proposed plan amendment is that of commercial and for-hire businesses currently engaged in the reef fish fishery. The impacts of the proposed action on these entities have been discussed above. The following discussion of impacts focuses specifically on the consequences of the proposed action on the mentioned business entities. An Initial Regulatory Flexibility Analysis (IRFA) is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." In addition to analyses conducted for the Regulatory Impact Review (RIR), the IRFA provides an estimate of the number of small businesses affected, a description of the small businesses affected, and a discussion of the nature and size of the impacts.

Determination of Significant Economic Impact on a Substantial Number of Small Entities

In general, a "substantial number" of small entities is more than 20 percent of those small entities engaged in the fishery (NMFS 1992). In 1992, a total of 2,214 permits were issued to qualifying individuals and attached to vessels, and are deemed to comprise the reef fish fishery in the U.S. Gulf of Mexico. In addition, 131 permittees have been granted the red snapper endorsement. The Small Business Administration (SBA) defines a small business in the commercial fishing activity as a firm with receipts of up to \$2.0 million annually. Practically all current participants of the reef fish fishery readily fall within such definition of small business. Since the proposed action will affect practically all the current participants, the "substantial number" criterion will be met. In particular, about 66 vessels will be directly affected by the elimination of multiple landings.

Economic impacts on small business entities are considered to be "significant" if the proposed action would result in any of the following: a) reduction in annual gross revenues by more than 5 percent; b) increase in total costs of production by more than 5 percent as a result of an increase in compliance costs; c) compliance costs as a percent of sales for small entities are at least 10 percent higher than compliance costs as a percent of sales for large entities; d) capital costs of compliance represent a significant portion of capital available to small

entities, considering internal cash flow and external financing capabilities; or e) as a rule of thumb, 2 percent of small business entities being forced to cease business operations (NMFS 1992).

While all the 66 vessels that reported multiple landings in 1993 will be directly affected by the proposed measure, only those that made real as against paper multiple landings may be considered to be the ones that will actually bear the burden of the proposed rule. But the difficulty of distinguishing real from paper multiple landings virtually precludes determination of potential revenue loss to be incurred by said vessels due to the adoption of the proposed regulation. In this regard, it is not possible to determine whether vessels adversely affected by the proposed measure would suffer reduced revenues of more than 5 percent.

As pointed out earlier, vessels directly affected by the proposed regulation would not be able to recoup all landings lost due to the ban on multiple landings since some of the extra fish available for harvest would likely be taken by other vessels. In this case, it is likely that these affected vessels would be making fewer trips, so their total costs may actually decrease. Thus, compliance with the proposed regulation would not result in an increase in production cost to said vessels. As pointed out earlier, however, their revenues are also bound to decrease.

Considering that practically all participants in the commercial reef fishery are small entities, no disproportionate effects on small versus large entities are expected from adoption of the proposed regulation. In addition, the proposed regulation does not require capital expenditures for compliance purposes. Finally, none of the affected vessels may be expected to cease business as a result of adopting the proposed regulation.

In summary, it is expected that the proposed regulation would not meet any of the criteria for a significant economic impact on small entities. It needs to be reiterated, however, that it is not possible to deduce whether those vessels directly affected by the proposed regulation would suffer more than 5 percent loss in their revenues.

Conclusion

In principle, the proposed measures in this regulatory amendment may be regarded as resulting in no significant economic impact on a substantial number of small business entities. Therefore, an IRFA is not required.

6. ENVIRONMENTAL ASSESSMENT

6.1 Environmental Consequences

Physical and Human Environment: To the extent that can be ascertained, the action proposed in this amendment will have no impact on the physical environment. The impacts on human environment are deemed to be beneficial in terms of enforcing trip limit rules and minimizing fishing trips made under unsuitable weather conditions.

Fishery Resource: The status of the stock is discussed under Section 4 and the impacts on fishery stock of the proposed action in this amendment is discussed under Section 5. It may be noted that the only changes proposed under this amendment are the prohibition of multiple landings on the same day and the postponement of the start of the fishing season to February 10. The effects of these changes are mainly socioeconomic in nature and are discussed in the RIR. Maintaining the TAC for red snapper is consistent with the target recovery for the stock; maintaining the TAC for shallow water groupers is consistent with the mandated choice of a TAC within the recommended ABC.

Impact on Other Fisheries: During commercial red snapper closed seasons or when trip limits have been filled, commercial fishermen may choose to target other species instead of, or in addition to, red snapper. Vermilion snapper and triggerfish have been mentioned as possible alternatives. Fishermen who made multiple daily landings of red snapper in 1993 and will be limited to one trip limit per day in 1994 may increase their targeting of alternative species. This may be offset by an increase in the length of the open season, delaying the time until all red snapper fishermen have to target other species due to the quota closure.

Effect on Endangered Species and Marine Mammals: The NOAA conducted a consultation under Section 7 of the Endangered Species Act regarding the impact of Amendment 1 which included the framework measures under which this action is being taken. Therefore, no additional Section 7 consultation is necessary. A biological opinion resulting from that consultation found that neither the directed fisheries nor the proposed action will jeopardize the recovery of endangered or threatened species or their critical habitat.

Effect on Wetlands: The proposed action will have no effect on flood plains, wetlands, or rivers.

Mitigating Measures: No mitigating measures related to the proposed action are necessary because there are no harmful impacts to the environment.

Unavoidable Adverse Affects: The proposed action does not create unavoidable adverse affects.

Irreversible and irretrievable commitments of resources: There are no irreversible commitments of resources caused by implementation of this amendment.

6.2 Finding of No Significant Environmental Impact

The proposed amendment is not a major action having significant impact on the quality of the marine or human environment of the Gulf of Mexico. The proposed action is an adjustment of the original regulations of the FMP under the framework procedure set forth in Amendment 1 to rebuild overfished reef fish stocks. The proposed action should not result in impacts significantly different in context or intensity from those described in the environmental impact statement and environmental assessment published with the regulations implementing the FMP and Amendment 1.

Having reviewed the environmental assessment and available information relative to the proposed actions, I have determined that there will be no significant environmental impact resulting from the proposed actions. Accordingly, the preparation of a formal environmental impact statement on these issues is not required for this amendment by Section 102(2)(c) of the National Environmental Policy Act or its implementing regulations.

Approved:

Assistant Administrator for Fisheries

Date

7. OTHER APPLICABLE LAW

7.1 Habitat Concerns

Reef fish habitats and related concerns were described in the FMP and updated in Amendments 1 and 5. The actions in this amendment do not affect the habitat.

7.2 Vessel Safety Considerations

If a derby fishery develops, fishermen may feel obligated to fish regardless of weather conditions. Delaying the opening of the red snapper season will allow fishermen to avoid fishing during a period of frequent hazardous weather conditions and will result in a positive impact on vessel safety.

7.3 Coastal Zone Consistency

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires that all federal activities which directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The proposed changes in federal regulations governing reef fish in the EEZ of the Gulf of Mexico will make no changes in federal regulations that are inconsistent with either existing or proposed state regulations.

While it is the goal of the Council to have complementary management measures with those of the states, federal and state administrative procedures vary, and regulatory changes are unlikely to be fully instituted at the same time.

This amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, and Mississippi to the maximum extent possible; Texas does not have an approved Coastal Zone Management program. This determination has been submitted to the responsible state agencies under Section 307 of the Coastal Zone Management Act administering approved Coastal Zone Management programs in the states of Alabama, Florida, Mississippi, and Louisiana.

7.4 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to control paperwork requirements imposed on the public by the Federal Government. The authority to manage information collection and record keeping requirements is vested with the Director of the Office of Management and record keeping requirements is vested with the Director of the Office of Management and Budget. This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

This amendment does not impose any additional paperwork requirements on the public.

7.5 Federalism

No federalism issues have been identified relative to the actions proposed in this amendment. The affected states have been closely involved in developing the proposed management measures and the principal state officials responsible for fisheries management in their respective states have not expressed federalism related opposition to adoption of this amendment. Therefore, preparation of a federalism assessment under Executive Order 12612 is not necessary.

8. PUBLIC REVIEW

A public hearing to obtain public comments on this regulatory amendment was held during the Gulf Council meeting in September 1993 in New Orleans, Louisiana. Copies of this document may be obtained from the Gulf of Mexico Fishery Management Council office, 5401 West Kennedy Boulevard, Suite 331, Tampa, Florida 33609, (813)228-2815.

LIST OF AGENCIES CONSULTED

Gulf of Mexico Fishery Management Council's
-Standing and Special Reef Fish Scientific and Statistical Committees
-Reef Fish Advisory Panel
-Reef Fish Stock Assessment Panel
-Socioeconomic Panel

National Marine Fisheries Service
-Southeast Fisheries Center

RESPONSIBLE AGENCY:

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(813)228-2815

LIST OF PREPARERS

Gulf of Mexico Fishery Management Council
- Steven Atran, Population Dynamics Statistician
- Antonio Lamberte, Economist

9. REFERENCES

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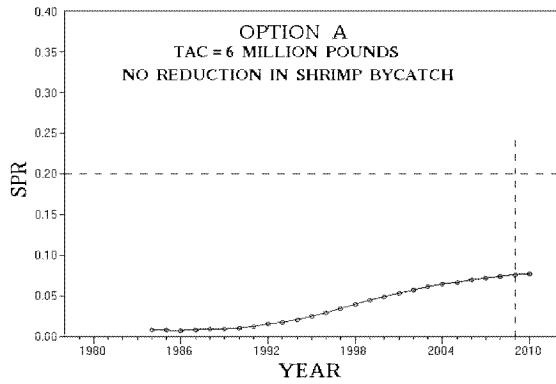


Figure 1. Forecast of future trend in SPR for Option A.

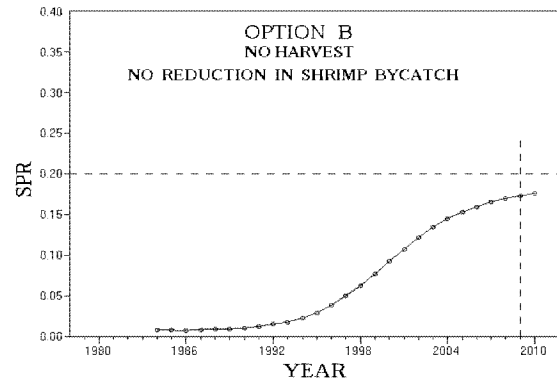


Figure 2. Forecast of future trend in SPR for option B.

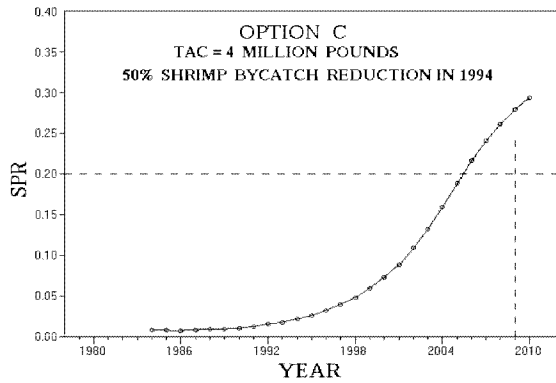


Figure 3. Forecast of future trend in SPR for option C.

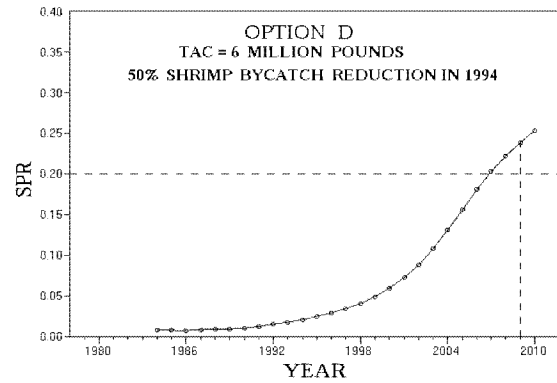


Figure 4. Forecast of future trend in SPR for option D.

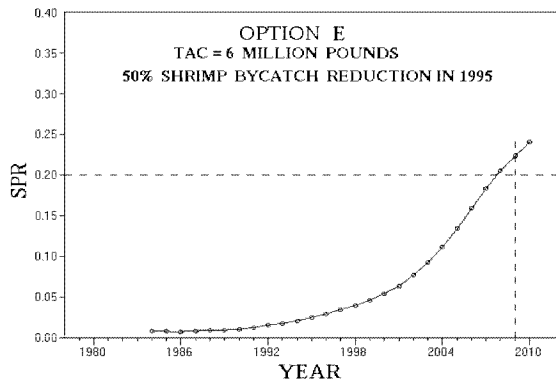


Figure 5. Forecast of future trend in SPR for option E.

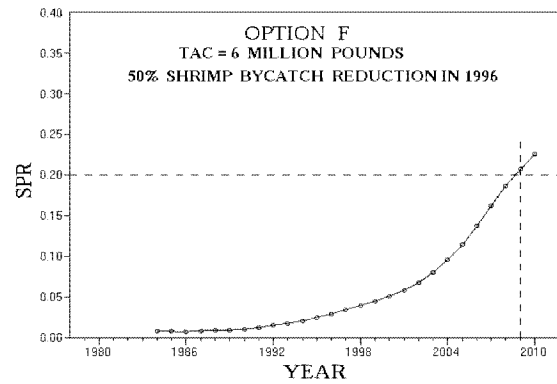


Figure 6. Forecast of future trend in SPR for option F.

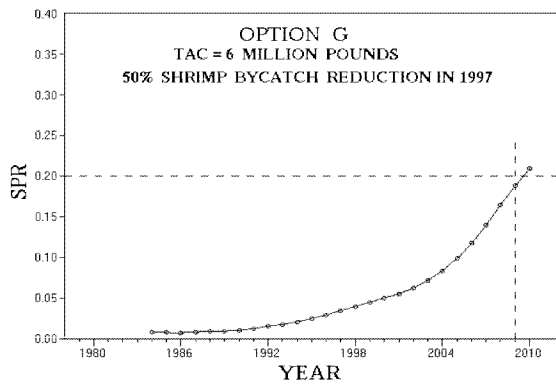


Figure 7. Forecast of future trend in SPR for option G.

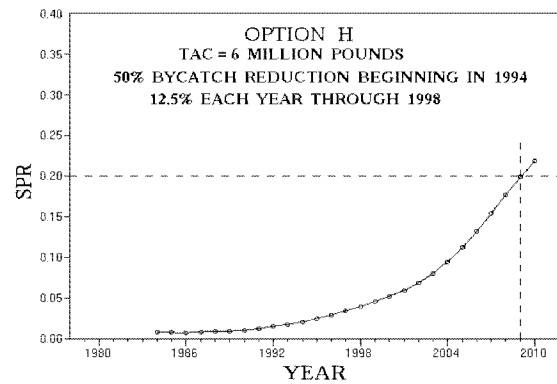


Figure 8. Forecast of future trend in SPR for option H.

Table 1. Summary of TACs, Fishing Mortality Rates, and associated SPR estimates from which the red grouper ABC ranges were derived.

Note: A TAC of 9.8 represents the present TAC but with both the commercial and recreational allocations filled. A TAC of 7.6 represents the current amount of commercial and recreational landings. The TACs ranging from 4.1 to 4.8 represent the TACs that would have to be achieved next year to effect an immediate $F_{0.1}$ fishing mortality rate.

Release Mortality = 33 %						
	18 Inch Minimum Size			20 Inch Minimum Size		
TAC Level	F	Amount of Discards	SPR	F	Amount of Discards	SPR
9.8 MP	0.49	0.60 MP	22%	0.60	1.10 MP	23%
8.6 MP	0.42	0.52 MP	26%	0.51	0.96 MP	26%
7.6 MP	0.36	0.45 MP	30%	0.44	0.84 MP	30%
4.8 MP	0.22	0.28 MP	44%			
4.4 MP				0.24	0.48 MP	46%
Release Mortality = 50 %						
	18 Inch Minimum Size			20 Inch Minimum Size		
TAC	F	Amount of Discards	SPR	F	Amount of Discards	SPR
9.8 MP	0.49	0.90 MP	21%	0.61	1.66 MP	21%
8.6 MP	0.42	0.78 MP	25%	0.52	1.45 MP	24%
7.6 MP	0.36	0.68 MP	29%	0.44	1.27 MP	28%
4.5 MP	0.21	0.40 Mp	44%			
4.1 MP				0.22	0.68 MP	47%

Source: 1993 Reef Fish Stock Assessment Panel Report

Table 2. Summary of TACs, SPR Levels, and Recreational Allocation and Commercial Quota for Shallow Water Grouper (Derived from Table 1 for Red Grouper).

Release Mortality = 33 Percent						
TAC ⁴ Level	18-Inch Minimum Size			20-Inch Minimum Size		
	SPR	Commercial ⁵ Quota	Recreational Allocation	SPR	Commercial Quota	Recreational Allocation
15.9	22%	10.4	5.5	23%	10.4	5.5
14.0	26%	9.1	5.0	26%	9.1	5.0
12.4	30%	8.0	4.4	30%	8.0	4.4
7.8	44%	5.1	2.7			
7.2				46%	4.7	2.5

Release Mortality = 50 Percent						
TAC ¹ Level	18-Inch Minimum Size			20-Inch Minimum Size		
	SPR	Commercial ² Quota	Recreational Allocation	SPR	Commercial Quota	Recreational Allocation
15.9	21%	10.4	5.5	21%	10.4	5.5
14.0	25%	9.1	4.9	24%	9.1	5.0
12.4	29%	8.0	4.4	28%	8.0	4.4
7.3	44%	4.8	2.5			
6.7				47%	4.4	2.3

⁴ Based on conversion rate of 1.626 since red grouper comprised 61.5 percent of shallow-water grouper landings (1986-1991).

⁵ Allocation rate from Amendment 1, Table 8.1, is: commercial 65 percent/recreational 35 percent.

