

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

Lincoln Center, Suite 881 • 5401 W. Kennedy Blvd.  
Tampa, Florida 33609 • Phone: 813/228-2315

May 12, 1989

Dr. Joseph W. Angelovic  
Acting Regional Director  
National Marine Fisheries Service  
Southeast Regional Office  
9450 Koger Boulevard  
St. Petersburg, Florida 33702

00.MAY 39 \* 003907

Dear Joe:

At their joint meeting on April 26, 1989, the Gulf and South Atlantic Fishery Management Councils adopted recommendations for levels of total allowable catch (TAC) and recreational bag limits for king and Spanish mackerels.

All proposed TACs are within the ABC ranges recommended by the Councils' Stock Assessment Panel and are well below the upper limit. The Councils' Scientific and Statistical Committees have endorsed the panel's report as being the best available data.

The Councils also recommend no change in bag limits which, based on catches in the 1988-1989 season and revision of TACs, may be expected to maintain recreational fisheries throughout the 1989-1990 fishing year and be acceptable and compatible to those set for adjacent states.

In this regard and given that the vast majority of Spanish mackerel caught off Florida are taken in State waters, the Councils propose to continue a bag limit of 4-fish in adjacent federal waters identical to that set for State waters by the Florida Marine Fisheries Commission.

Councils' recommendations are as follows:

Atlantic king mackerel (ABC = 6.9 - 15.4 M)

TAC = 9.0 M  
Recreational allocation = 5.66 M  
Commercial allocation = 3.34 M

Recreational bag limit: No change (2 fish per person per trip off Florida, and 3 off other South Atlantic states)

Gulf king mackerel (ABC = 2.7 - 5.8 M)

TAC = 4.25 M  
Recreational allocation = 2.89 M  
Commercial allocation = 1.36 M  
Eastern zone = 0.94 M  
Western zone = 0.42 M

Recreational bag limit: No change (3 fish per person per trip excluding captain and crew, or two for all persons, whichever is greater, on charter boats; and, two fish per person per trip on other boats)

Atlantic Spanish mackerel (ABC = 4.1 - 7.4 M)

TAC = 6.0 M  
Recreational allocation = 1.44 M  
Commercial allocation = 4.56 M

Recreational bag limit: 4 off Florida, and 10 fish per person per trip off other South Atlantic states

Gulf Spanish mackerel (ABC = 4.9 - 6.5 M)

TAC = 5.25 M  
Recreational allocation = 2.26 M  
Commercial allocation = 2.99 M

Recreational bag limit: 4 off Florida, and 10 fish per person per trip off other Gulf states

The report of the Council's Stock Assessment Panel is attached for your information. It provides the rationale for the various ABC ranges.

Prior to their joint April (1989) meeting, the Councils also convened and received recommendations from their advisory panels. The recommendations to the Councils are as follows:

	<u>South Atlantic Advisory Panel</u>		<u>Gulf Advisory Panel</u>	
	TAC	Bag	TAC	Bag
Atlantic king	12.0	4	10.0	same level but equitable
Gulf king	4.5	3 charter, 2 private	5.8	3 charter, 2 private
Atlantic Spanish	6.0	no change	6.0	equitable to all states
Gulf Spanish	5.7	no change	6.0	same level but equitable

The Councils also heard testimony at a public hearing session in which recreational and charter boat fishermen expressed a desire for reasonable bag limits that would extend through the season without reverting to zero. Commercial fishermen noted an increase in Spanish mackerel abundance which should allow an increase in TAC.

The Report of the Mackerel Stock Assessment Panel (attached) concludes that the Atlantic migratory group of king mackerel is not overfished because the fishing mortality rate does not presently appear to be exceeding F 0.1, and the spawning stock biomass does not appear to be low enough to affect recruitment. The Councils recommend an increase in TAC but lower than that for the period of 1985 - 1987 when the ABC range was equal to the current range of 6.9 - 15.4 M.

Similarly, the Gulf migratory group shows indications of increased recruitment but to a lesser extent. The Councils propose a moderate increase in TAC to 4.25 M, which is slightly more conservative than that of the Panel's most likely point estimate of ABC at 4.4 M. This will provide a 25 percent increase in the commercial allocation while providing better odds that the same recreational bag limits will continue further into the

season without reverting to zero.

Spanish mackerel recruitment has been variable with a strong year class of one-year olds in the Atlantic migratory group. Again, moderate increases in TAC are proposed for both groups near midrange of the ABCs.

Because Spanish mackerel is a near-shore species occurring largely in state waters, the Councils propose bag limits compatible with those for state waters. Reversion of Spanish mackerel bag limits to zero when quotas are filled will protect the stock in federal waters and in the waters of those states which have adopted similar provisions for closure. Cooperative enforcement of EEZ bag limits and compatible bag limits or seasonal closures in state waters, where a large fraction of the stock occurs, are desirable but dependent on the acceptability of the regulations to the constituency of states affected. The Councils propose to provide reasonable and acceptable regulations for cooperative management of mackerel stocks throughout their range.

To assist you in implementing the proposed rule change, we are enclosing a copy of the Report of the Mackerel Stock Assessment Panel and a Regulatory Impact Review. Draft regulations have been previously provided to your staff.

Sincerely,

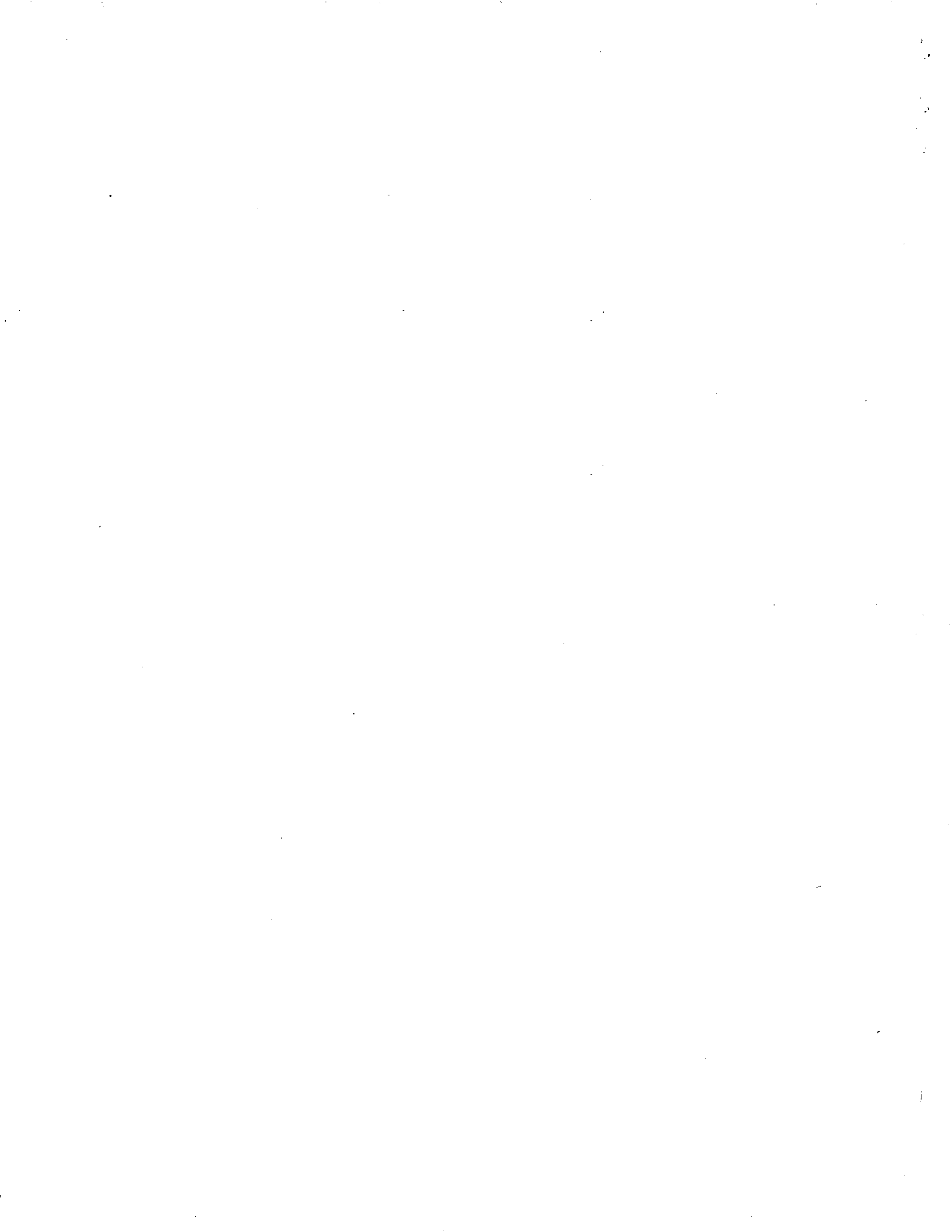
*Bill*  
*ML*

William D. Chauvin  
Chairman

WDC:TRL:bab

Enclosure

cc: Gulf Council  
Bob Mahood  
Staff



**REGULATORY IMPACT REVIEW**  
of  
**CHANGES IN TAC, QUOTAS, AND BAG LIMITS**  
for  
**KING AND SPANISH MACKEREL**  
**GULF OF MEXICO AND ATLANTIC MIGRATORY GROUPS**  
managed under the  
**FISHERY MANAGEMENT PLAN**  
for the  
**COASTAL MIGRATORY PELAGIC RESOURCES**  
of  
**GULF OF MEXICO AND THE SOUTH ATLANTIC**

Prepared by  
**Gulf of Mexico Fishery Management Council**  
and  
**National Marine Fisheries Service**

**May 1989**

## INTRODUCTION

Executive Order 12291 "Federal Regulations" establishes guidelines for promulgating new regulations and reviewing existing regulations. Under these guidelines each agency, to the extent permitted by law, is expected to comply with the following requirements: (1) administrative decisions shall be based on adequate information concerning the need for and consequences of proposed government action; (2) regulatory action shall not be undertaken unless the potential benefit to society for the regulation outweighs the potential costs to society; (3) regulatory objectives shall be chosen to maximize the net benefits to society; (4) among alternative approaches to any given regulatory objective, the alternative involving the least net cost to society shall be chosen; and (5) agencies shall set regulatory priorities with the aim of maximizing the aggregate net benefit to society, taking into account the condition of the particular industries affected by regulations, the condition of the national economy, and other regulatory actions contemplated for the future.

In compliance with Executive Order 12291, the Department of Commerce (DOC) and the National Oceanic and Atmospheric Administration (NOAA) have determined that this proposed notice action for changes in the total allowable catch, allocations and bag limits for king and Spanish mackerel reflect important DOC/NOAA policy concerns and are the object of considerable public interest. In such a case, DOC/NOAA require the preparation of a Regulatory Impact Review (RIR). The RIR provides a comprehensive review of the level and incidence of impact associated with the proposed or final regulatory actions. The analysis also 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 problems. The purpose of the analysis is to ensure 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.

## COASTAL MIGRATORY PELAGICS PLAN

The Fishery Management Plan for the Coastal Migratory Pelagic Resources of the Gulf of Mexico and the South Atlantic (FMP) was prepared jointly by the Gulf of Mexico and South Atlantic Fishery Management Councils (Councils). The Assistant Administrator for Fisheries, NOAA (Assistant Administrator) approved the FMP on April 1, 1982, and the Secretary of Commerce (Secretary) implemented final regulations on February 4, 1983, (48 FR 5272), under the authority of the Magnuson Fishery Conservation and Management Act, as amended (Magnuson Act). Amendment 1 to the FMP was prepared jointly by the Councils, approved on July 26, 1985 by the Regional Director, NMFS, and implemented September 22, 1985 (50 FR 34843). Amendment 2 was submitted on April 1, 1987 and implemented in July, 1987. Amendment 3 was submitted on March 14, 1989 and is under review.

The FMP manages the coastal migratory pelagics fishery throughout the exclusive economic zone (EEZ) off the South Atlantic coastal states from the Virginia-North Carolina border south and through the Gulf of Mexico to the U.S.A.-Mexico border. Major species in the management unit for the FMP are Spanish mackerel, king mackerel, and cobia. Within the mackerel stocks, Gulf of Mexico and Atlantic migratory groups are distinguished for both species. Amendments 1 and 2 provide for annual assessments and adjustment of acceptable biological catch (ABC), total allowable catch (TAC), and bag limits for king and Spanish mackerels, both of which have within them one or more overfished migratory groups.

## PROBLEMS BEING ADDRESSED

### 1. Atlantic and Gulf Spanish Mackerel and Gulf King Mackerel are Overfished

The 1989 report of the joint Councils' stock assessment panel states that until the risk of recruitment overfishing is no longer a concern, Spanish mackerel and the Gulf migratory group of king mackerel should be considered overfished.

### 2. New Recruits into the Atlantic and Gulf Spanish Mackerel and Gulf King Mackerel Stocks Need Protection to Allow for an Increase in the Spawning Stock Biomass

There is evidence of some increase in recruitment in most recent years. The stock assessment panel felt there was potential for the increased recruitment to contribute to recovery of the spawning biomass as well as increased catch levels. However, conservative fishing mortality rates are still needed as there is considerable uncertainty in the strength of the newest year classes. Female Spanish mackerel may begin spawning at age 1, and age 2 females make a significant contribution to the spawning potential of the stock. Female king mackerel are sexually mature at age 4.

## OBJECTIVES

1. To restore the spawning stock biomass of Spanish mackerel and Gulf king mackerel.
2. To protect new recruits in the mackerel fishery so they can add to the spawning biomass and thereby allow for larger catches in the future.

## DESCRIPTION OF THE COMMERCIAL AND RECREATIONAL KING AND SPANISH MACKEREL FISHERIES

King and Spanish mackerel are important to both recreational and commercial fishermen in the Gulf of Mexico and South Atlantic waters. Following is a brief description of the conditions in both of these fisheries. A more complete description exists in the Coastal Migratory Pelagics FMP. Table 1 presents a summary of the performance of the fishery in the 1988-1989 fishing year.

Recreational anglers are estimated to have caught 7.2 million pounds (M) of Atlantic and 9.1 M of Gulf king mackerel in the 1987 fishing year (ending March 31 or June 30, 1988, depending on the stock). Anglers also took 1.6 M of Atlantic and 2.9 M of Gulf Spanish mackerel. The majority of the recreationally caught king mackerel were taken by charter and private boat anglers with a small percentage being caught from man-made structures. Recreational catches of Spanish mackerel were more evenly distributed between charter boat, private boat, and man-made structures than were king mackerel catches. In the 1988-1989 fishing year, recreational quotas were exceeded for all but Gulf Spanish mackerel.

Commercial landings of Atlantic and U.S. Gulf king mackerel were 3.4 and 0.9 M respectively. Spanish mackerel commercial landings for the Atlantic and Gulf Spanish mackerel were 3.7 and 1.4 M. King mackerel are caught mostly with gill nets and hooks and lines, but purse seines and drift nets, which is a newly developing fishery off the east coast of Florida, were also used for this species. Spanish mackerel are caught almost exclusively with gill nets and over 85 percent of the commercial fishery occurs in

Florida. Preliminary estimates place the number of active gill net vessels in Florida at 47 in 1985 and 33 in 1986. The estimates for hook and line vessels in Florida are 250 for 1985 and 200 for 1986. In the 1987-1988 fishing year, commercial quotas of Gulf king mackerel were met in the Gulf after 6 months of fishing. The commercial quota for the Gulf group of Spanish mackerel was met in March while the Atlantic group quota was met in December (see Table 1.)

## METHODOLOGY AND FRAMEWORK FOR ANALYSIS

The alternatives considered are described below, and the allocations are summarized in Table 2. For this Notice Action the choice of TAC cannot exceed the upper ranges of ABC as estimated by the stock assessment panel and summarized in Table 2. There would be no relevance in comparing these alternatives to a hypothetical unregulated fishery since "no regulation" is not an option under Notice Action.

Ideally, the expected net present values of the yield streams associated with the different alternatives would be compared in evaluating impacts. Unfortunately, estimates of the yield streams and their associated probabilities are not available. The approach taken here is to describe short-term costs or benefits in terms of foregone or additional catch as compared to 1988-1989 allocations. The analysis provides for separate evaluation of expected impacts on the commercial and recreational sectors and addresses the likely distribution of these impacts. Long-term economic effects of stock recovery of alternative TAC's are estimated in Amendment Two. Although the data to compare long term effects of various possible TAC levels within ABC are not available, the expected direction and possible magnitude of economic impacts are discussed. Effects of closures related to allocations are evaluated where appropriate. The attempts at analysis revealed the need to have data available in a timely fashion. Some thought needs to be given to situations where preparers of RIR's are asked to evaluate changes from current management before the current fishing year has expired.

## IMPACTS OF PROPOSED AND ALTERNATIVE ACTIONS

### Gulf Group King Mackerel

The stock assessment panel concluded that the U.S. Gulf resource appeared to have continued to respond somewhat toward recovery. An ABC range of 2.7 - 5.8 M has been established. A TAC at the upper range of ABC affords a smaller chance for stock recovery than a TAC at the lower end. There is a large chance that a high catch would allow no recovery. Although spawning stock biomass has increased a small amount and the fishing mortality rate is at or just below the target rate, recruitment has remained stable at low levels with no large year class entering the fishery to accelerate recovery. As provided in Amendment Two, the TAC may not be set higher than the upper range of ABC. Fixed allocations are 32 percent commercial and 68 percent recreational. The commercial allocation is divided 69 percent eastern zone and 31 percent western zone.

#### 1. Preferred Alternative: Set TAC at 4.25 M

This TAC reflects the Councils' recognition of the limited recovery evidenced by the Gulf stock and the contribution this can make to an increased harvest along with a continuing concern about recovery of the stock. The recreational bag limit remains unchanged but will revert to zero when the recreational allocation is reached.



Commercial allocation	1.36 M
Recreational allocation	2.89 M
Bag limit = no change - 2 fish/person/trip private, 3 fish/person/trip charter (excluding captain and crew) or 2 fish/person/trip (including captain and crew)	

The commercial allocation of the proposed TAC for the Gulf group of king mackerel is 270,000 pounds greater than the current allocation. The commercial allocation is 0.5 M pounds less than the maximum possible under the revised ABC. Thus the exvessel value of the short-term gain to the commercial sector for the 1989-1990 allocation is approximately \$270,000, based on comparative values in Poffenberger (p. 44), but \$500,000 less than the maximum possible under the revised ABC.

In 1988-1989 there were 889 commercial king mackerel permits issued for the Gulf migratory group of king mackerel (M. Justen, NMFS, personal communication). If a like number is issued in 1989-1990 and the gain is shared equally among license-holders, the gain would be approximately \$304 per license-holder. A more likely scenario is that the bulk of the gain would accrue to those license-holders specializing in mackerel fishing. Poffenberger (p. 26) reports that there were 33 vessels fishing for mackerel on the Florida west coast in 1985 with hook and line and gill nets. The NMFS vessel count does not include unregistered craft that may catch substantial quantities of king mackerel, and it has no information on directed mackerel fisheries by vessel in areas of the Gulf other than Florida. An upper limit to the average vessel gain can be calculated to be \$8,182 per vessel by ascribing the entire \$270,000 increase to the 33 vessels in the NMFS count.

The benefit to be gained from selecting this level of TAC as opposed to the upper end of the ABC range is an enhanced probability of continued recovery of the Gulf stock of king mackerel. Data are not available to quantify this expected benefit. However, the continuing gain in allowable catch for the last two years is evidence of the wisdom of employing a conservative approach to setting TAC so as to hasten stock recovery.

The recreational allocation of the proposed TAC for the Gulf group of king mackerel is 580,000 pounds greater than the 1988-1989 allocation, and 1.05 M pounds less than the maximum possible under the revised ABC. Using the methodology of Melon (1988) tables 5.5 and 5.6 to estimate the value of this potential increase in catch, we derive an estimated net economic benefit in a range of 1.51 to 12.22 million dollars. A minimum estimate of the number of additional person-trips that could be afforded by the 580,000 pound quota increase can be made by assuming that each person-trip takes two fish (the effective bag limit) weighing approximately 8.5 pounds each. Thus the increase in quota would allow an additional 34,000 successful person-trips.

Increasing the recreational allocation while maintaining the same bag limits, which charter boat operators say are acceptable, increases the probability that the allowable bag limit remains in effect longer in the fishing year before reverting to zero when the allocation is reached. In the current fishing year, the allocation was reached on December 12, and the bag limit reverted to zero in the Gulf EEZ.

2. Rejected Alternative: Set TAC at 5.8 M, the upper range of ABC

Commercial allocation	1.86 M
Recreational allocation	3.94 M
Bag limit = 2 fish private, 3 fish charter	

This alternative provides the maximum short term returns. However, the stock assessment group's non-quantitative estimate was that the probability of stock recovery would be minimized by choosing this level of TAC. Thus the expected long-term benefits are expected to be less under this alternative but cannot be calculated.

3. Rejected Alternative: Leave TAC at 3.4 M, the 1988-1989 Level.

Commercial allocation	1.09 M
Recreational allocation	2.31 M

OR

4. Rejected Alternative: Set TAC at 2.7 M, the low range of ABC.

Commercial allocation	0.64 M
Recreational allocation	1.84 M

Either of these alternatives represent short term losses as compared to the preferred alternative. Further reductions in short-term catches will increase the probability of recovery of the stocks within the time frame specified by the Council. However, there is no evidence that the increases in long-term benefits will more than offset the expected short-term costs. This hypothesis should be tested by making the relevant calculations when the data become available.

Atlantic Group King Mackerel

The stock assessment report states that the abundance of Atlantic king mackerel of spawning ages increased during the early to mid 1980's and may have declined slightly in recent years. There appears to be an adequate spawning biomass present which should continue in the future as long as fishing mortality rates do not increase greatly. There appears to be significant amounts of recruitment coming into the fishery, but again high fishing mortality rates could reduce the size of these year classes. This stock is not currently considered to be overfished because the fishing mortality rate does not presently appear to be exceeding F 0.1 and the spawning stock biomass does not appear to be low enough to affect recruitment. TAC is currently set at 7.0 M in ABC range of 5.5 to 10.7 M. For the 1989-1990 season the assessment panel recommends an ABC range of 6.9 to 15.4 M which was the initial range for the 1986 and 1987 fishing years. The fixed allocation ratio is 62.9 percent recreational and 37.1 percent commercial.

1. Preferred Alternative: Set TAC at 9.0 M

Commercial allocation	3.34 M
Recreational allocation	5.66 M
Bag Limit = 2 fish per person per trip off Florida; 3 fish per person per trip off Georgia, South Carolina, and North Carolina	

The commercial allocation under the proposed TAC is 0.74 M more than in 1988-1989 representing a potential short-term gain of \$740,000 to the commercial fishing vessels fishing on the Atlantic king mackerel stock. The commercial catch has exceeded the proposed quota of 3.34 M in only 2 of the past 10 years. In 1988-1989, there were 1,331 vessels licensed to fish on Atlantic king mackerel. If a like number were to be licensed

in 1989-1990 and all licensees shared equally, the average increase in expected revenue per vessel would be \$556.

The recreational allocation of 5.66 M is 1.26 M more than the current allocation which was reached in mid-October at which time the bag limit reverted to zero in the EEZ. Because the stock is no longer considered "overfished" the bag limit will not revert to zero this year when the 5.66 M allocation is reached. The Councils have, therefore, maintained the same bag limit with the intent that catches can be held within the allocation. The 2-fish bag limit for federal waters off Florida was set to be consistent with regulations for state waters. At an average weight of 8.5 pounds per fish (1988 data) the additional 1.26 M would support an additional 74,000 fully successful 2-fish limit trips or 49,000 fully successful 3-fish limit trips. If Melon's (1988) Gulf model were applicable to Atlantic king mackerel, the gain of 1.26 M of recreational catch would have a net economic benefit of 1.06 to 3.87 million dollars.

2. Rejected Alternative: Set TAC at 15.4 M, the upper range of ABC

Commercial allocation	5.71 M
Recreational allocation	9.69 M
Bag limit = 3 fish per person per trip	

This alternative would provide the maximum short-term return. However, neither the recreational or commercial catch has reached this level in the last ten years. The stock assessment report advises that very high fishing mortality rates could reduce the size of the now abundant year classes recruiting to the fishery. The long-term benefits of choosing the maximum TAC are expected to be less than the preferred alternative but cannot be calculated.

3. Rejected Alternative: Set TAC at 7.0 M, the 1988-1989 level

Commercial allocation	2.6 M
Recreational allocation	4.4 M
Bag limit = 3 fish per person per trip (3 off Florida)	

With an increase in ABC, this option would prevent the harvest of optimum yield. Under the current low TAC recreational bag limit reverted to zero in mid-October and the commercial fishery quota was filled in late November.

4. Rejected Alternative: Set TAC at 6.9 M, the lower range of ABC

Commercial Allocation	2.56 M
Recreational allocation	4.34 M
Bag limit = 3 fish per person per trip	

This alternative represents a short-term loss compared to the preferred alternative. Further reductions in short-term catches are not needed because the stock is not overfished and the goal is to produce optimum yield.

Gulf Group Spanish Mackerel

The stock assessment panel found evidence of some increase in recruitment and spawning stock biomass in the most recent years. The panel felt there was potential for the

increased recruitment to continue to contribute to recovery of the spawning biomass while allowing some increase in yield. Recommended ABC range is 4.9 to 6.5 M. Allocations are 57 percent commercial and 43 percent recreational.

1. Preferred Alternative: Set TAC at 5.25 M

Commercial allocation	2.99 M
Recreational allocation	2.26 M
Bag limit = 4 fish per person per trip off Florida, and 10 fish per person per trip off other Gulf states (reverts to zero if the allocation is reached)	

The commercial allocation of the proposed TAC for the Gulf group of Spanish mackerel is 140,000 pounds above the 1988-1989 TAC. At a \$0.30 per pound average exvessel price, the commercial allocation is worth \$42,000 more than the 1988-1989 allocation. There were 756 commercial permits issued in 1988-1989 for Gulf Spanish mackerel. The gain per vessel would be \$56 if all shared equally. An upper limit to the average vessel gain can be calculated as for Gulf group king mackerel by dividing the total gain among the 33 Florida west coast hook and line and gill net vessels. The upper limit of the gain is about \$1,273 for the average vessel. The NMFS vessel count as reported in Poffenberger does not include unregistered craft that may catch substantial quantities of Spanish mackerel, and it has no information on vessels engaged in directed Spanish mackerel fisheries in areas of the Gulf other than Florida.

The recreational allocation of the proposed TAC for the Gulf group of Spanish mackerel is 110,000 million pounds greater than the 1988-1989 allocation. The per angler or per trip increase in catch cannot be estimated as the angler and trip populations are unknown. To the extent that this projected increase in TAC implies an increase in the retained catch of Gulf group Spanish mackerel by recreational fishermen, there will be an increase in value to the recreational sector.

The 1988-1989 recreational allocation has not been filled with 4 fish in Florida and 10 fish per person per trip bag limit in other Gulf states. Increasing the allocation while maintaining the bag limit should extend through the effective fishing season. The Gulf group Spanish mackerel fishery tends to occur in the summer except for south Florida where it occurs more evenly throughout the year. In the 1985-1987 fishing years, data from the eastern and northern Gulf show that 58 percent of the successful angler trips (trips in which Spanish mackerel were caught) on private boats occurred off Florida and 42 percent off the northern Gulf states (comparable data for Texas were unavailable). The current bag limit of 4-fish in the EEZ off Florida and 10-fish off other Gulf states remains the same. The limit off Florida is intended to be consistent with the limit set for state waters. The bag limit is expected to extend through the season as it did in 1988-1989 without reverting to zero.

2. Rejected Alternative: Set TAC at 6.5 M, upper ABC range.

Commercial allocation	3.7 M
Recreational allocation	2.8 M
Bag limit = 3 fish per person per trip (reverts to zero if allocation is reached)	

Compared with the preferred alternative, this alternative would provide short-term gains to both commercial and recreational fisheries. The increased ABC reflects increased

recruitment of fish which have not yet reached spawning age. Removing these fish before they enter the spawning stock would lead to a reduced rate of recovery for the stock. A reduced rate of recovery implies future economic losses.

3. Rejected Alternative: Set TAC at 5.0 M, 1988-1989 TAC level

Commercial allocation	2.15 M
Recreational allocation	2.85 M
Bag limit = 3 fish per person per trip (reverts to zero if allocation is reached)	

4. Rejected Alternative: Set TAC at 4.9 M, low ABC range.

Commercial allocation	2.79 M
Recreational allocation	2.11 M
Bag limit = 3 fish per person per trip (reverts to zero if allocation is reached)	

Both of these alternatives would yield short-term losses compared to the preferred alternative. They would, however, yield a somewhat higher probability of spawning stock recovery and longer term gain. The stock assessment panel notes that Spanish mackerel have a relatively short life span, being largely gone from the fishery by five or six years of age. The opportunity for rapid recovery of the spawning stock exists when a good year class appears and is protected. The panel concluded that the apparent improvement in recent recruitment would allow recovery to proceed yet allow some increase in yields. Setting TAC at the lower end of the ABC range, thus sacrificing short-term benefits for an unknown improvement in long-term gains could result in overall loss. Unfortunately, data are not available to calculate this trade off in quantitative value terms.

Atlantic Group Spanish Mackerel

The report of the stock assessment panel notes an historical decline in spawning biomass in the Atlantic but that recruitment may be up for this stock. The ABC range for this group is recommended to be 4.1 to 7.4 M. The allocation is 76 percent commercial and 24 percent recreational.

The 1988-1989 commercial allocation was taken by the end of December. Over 85 percent of the commercial fishery occurs in Florida and 90 percent of the landings were taken there within one month of the appearance of the fish. The recreational fishery had taken its allocation by October. The EEZ bag limit reverted to zero 5.5 months into the fishing year, but 290 percent of the quota was taken by the end of December.

1. Preferred Alternative: Set TAC at 6.0 M

Commercial allocation	4.56 M
Recreational allocation	1.44 M
Bag limit = 4 fish per person per trip off Florida, 10 other states (reverts to zero if allocation is reached)	

The commercial allocation of the proposed TAC is 1.52 M higher than the 1988-1989 allocation representing an increase worth \$456,000 to the commercial fishery. The

commercial permits for this group in the 1988-1989 fishery numbered 1,135. Equal distribution of the increase in value would be \$402 per vessel.

The recreational allocation from the proposed TAC is 0.48 M greater than in the 1988-1989 allocation. Given the bag limits and average weight during the 1988-1989 season (1.4 pounds yielding an increase of 343,000 fish) this amount will support an additional 86,000 fully successful angler trips off Florida; 34,300 angler trips off North Carolina, South Carolina, and Georgia; or some intermediate number representing a combination of trips in the two areas. The value of these additional trips is unknown.

2. Rejected Alternative: Set TAC at 7.4 M, upper range of ABC

Commercial allocation	5.62 M
Recreational allocation	1.78 M
Bag limit = 4 fish per person per trip off Florida, 10 other states (reverts to zero if allocation is reached).	

Since TAC would be set at the upper limit of ABC under this alternative, there would be no short-term loss from foregone catches by either the recreational or commercial fisheries. However, the probability of stock recovery within the given time frame would be reduced by some unknown amount, and long-term benefits would be reduced proportionately.

3. Rejected Alternative: Set TAC at 4.0 M, 1988-1989 TAC level

Commercial allocation	3.04 M
Recreational allocation	0.96 M
Bag limit = 4 fish per person per day off Florida, 10 other states (reverts to zero if allocation is reached)	

4. Rejected Alternative: Set TAC at 4.1 M, lower range of ABC

Commercial allocation	3.1 M
Recreational allocation	0.98 M
Bag limit - 4 fish per person per day off Florida, 10 other states (reverts to zero if allocation is reached)	

Both of these alternatives provide for less short-run economic gain than the preferred alternative but carry higher probabilities of stock recovery within the specified time frame and thus higher long-term benefits as compared to the preferred alternative. Data do not exist to estimate whether the net present values of the yield streams from these alternatives would be greater than that from the preferred alternative.

Government Costs of Regulation

Federal government costs of this action were associated with meetings, travel, calculation of ABC's, preparation of various documents and reviewing all documents. Other sources of additional costs include extraordinary research specifically done for the

purpose of this particular action, additional statistics costs, and additional enforcement costs resulting from the action. In the latter cases, no additional costs are anticipated.

Prepare and implement action	\$300,000
Research	None additional required
Statistics	None additional required
Enforcement	None additional required

## SUMMARY AND NET EXPECTED IMPACT OF PROPOSED ACTION

The notice action being addressed constitutes changes in management for four distinctive groups of king and Spanish mackerel. In essence, four independent actions are being considered and there is no justification to attempt a net benefit statement for all four actions considered as a unit. Therefore, this summary proceeds on the basis of the four groups of mackerels being considered as distinct fisheries.

The major emphasis of the summary (actually four summaries) is on the expected economic impact of the preferred alternatives. Where meaningful, net benefits of preferred alternatives are compared to net benefits from one or more of the rejected alternatives. As may be apparent in the summary statement, the alternatives preferred by the management councils are not always necessarily the preferred alternatives from an economic viewpoint.

Readers are reminded that the analysis generally uses the current set of regulations as baseline. The impacts from proposed new alternatives are usually compared to the current situation as opposed to the historical situation without management. Therefore, in the majority of cases, the discussions concern increased (or decreased) benefits or losses at the margin.

### Gulf Group King Mackerel

The preferred alternative (set TAC at 4.25 M with no change in bag limits) results in short-term gains while remaining near a middle-level probability of continued stock recovery and thus attainment of long-term gains. Commercial and recreational fisheries are affected in similar ways. The projected short-term commercial gain is 270,000 pounds valued at about \$270,000. Recreational catch is increased by 580,000 pounds and the resulting net economic benefit is estimated to be 1.51 to 12.22 million dollars. Although the data to make long-term increased benefits calculations are not available (a recurring case throughout all analyses), the favorable biological implications from this alternative would probably translate into similarly favorable long-term economic benefits for recreational and commercial fishermen.

### Atlantic Group King Mackerel

The preferred alternative (set TAC at 9.0 M with the same bag limits of two fish per person per trip off Florida, three fish off other states) is 2 million pounds above the 1988-1989 TAC. However, landings from the Atlantic king mackerel stock have not reached that level in recent years. The commercial allocation is to be increased by 740,000 pounds valued at \$740,000. The recreational allocation is to be increased by 1.26 million pounds with a net economic benefit of 1.06 to 3.87 million dollars while the bag limit is to remain the same (2 fish per person per trip off Florida and 3 fish off other Atlantic states). By retaining the current bag limits, the Councils propose to provide a better fit of the actual catch to the allocation. Landings in the 1987-1988 fishing year were about 1.2 M greater than the proposed TAC.

Landings under the current 1988-1989 TAC of 7.0 M were to have ended in the recreational fishery in mid-October and in the commercial fishery in late November as quotas were filled but were extended temporarily by court order. OY was reduced in 1988-1989 but is to be restored to about its maximum level.



### Gulf Group Spanish Mackerel

The recommended TAC is 525 M with a limit of four fish per person per trip off Florida and 10 off other states. In terms of the change from status quo, the new TAC provides for an increased commercial catch of 140,000 pounds over the current season. This catch will have an exvessel value of about \$42,000. Similarly, there can be an increase of up to 110,000 pounds (no value estimate provided) in catch by recreational anglers. This increase in allowable catch is due in part to the conservative approach taken in setting the 1988-1989 TAC to protect the increase in incoming year classes.

The current bag limits of 4-fish off Florida and 10 off other states remains unchanged. This limit extended through the current season and the 4-fish limit is consistent with Florida regulations.

### Atlantic Group Spanish Mackerel

The preferred alternative sets TAC at 6.0 M with no change in bag limits. This value is near the midpoint of ABC and thus appears to maintain a reasonable probability of continued stock recovery while allowing slightly increased levels of fishing. The exvessel value of the allowable increase in commercial catch is \$456,000. The allowable increase in recreational catch would suggest between 34,300 and 86,000 additional fully successful angler trips.

### Government Costs

Government costs for preparing and implementing this action are estimated at \$300,000. There are expected to be no additional costs from data collection, research or law enforcement from this action.

## REFERENCES

- Anonymous, 1988. Report of the mackerel stock assessment panel meeting of April 6-8, 1988, in Miami, Florida. Gulf of Mexico Fishery Management Council, Tampa, Florida. April, 1988.
- Bannerot, S.P. 1987. Effect of potential bag limits on recreational catch of king and Spanish mackerel in the Gulf of Mexico and South Atlantic regions of the southeastern United States. Unpublished manuscript. South Atlantic Fishery Management Council, Charleston, South Carolina.
- Milon, J.W. 1988. Estimating recreational angler participation and economic impact in the Gulf of Mexico mackerel fishery. Final report. Southeast Regional Office, National Marine Fisheries Service, St. Petersburg, Florida. Contract No. NA86WC-H-06116, RAS/CC31 (MARFIN).
- Poffenberger, John R. 1987. An economic assessment of the fisheries for king and Spanish mackerel. National Marine Fisheries Service, Southeast Fisheries Center, Economics and Statistics Office, 75 Virginia Beach Drive, Miami, Florida 33149. March, 1987.

TABLE 1  
MACKEREL QUOTAS, BAG LIMITS, CATCHES AND CLOSURES  
1988 - 1989 Fishing Year

	MILLIONS OF POUNDS		ALLOCATIONS	QUOTA	BAG LIMITS (per person per trip)	SEASON BEGAN	REPORTED CATCHES	PERCENT OF QUOTA	REPORTED THROUGH	DATE CLOSED
	ABC	TAC								
<b>KING MACKEREL</b>										
MSY - 26.2 mill lb										
Atlantic Migratory Group	5.5 - 10.7	7								
ABC for 1989/90	6.9 - 15.4									
Atlantic Recreational			62.9%	4,400,000	3	4/1/88	4,440,000	101%	12/31/88	2/23/89
Atlantic Commercial			37.1%	2,600,000	2 EEZ OFF FL	4/1/88	2,956,000	114%	12/31/88	2/23/89
Revised Atlantic Commercial				2,866,000			2,956,000	103%	12/31/88	2/23/89
Gulf Migratory Group	0.5 - 4.3	3.4								
ABC for 1989/90	2.7 - 5.8									
Gulf Recreational			68%	2,310,000	2 Private	7/1/88	3,370,000	146%	12/31/88	12/17/88
Gulf Commercial			32%		2 or 3 Charter					
Eastern Zone			69%	750,000		7/1/88	806,100	107%	12/31/88	12/31/88
Western Zone			31%	340,000		7/1/88	350,486	103%	12/2/88	12/3/88
<b>SPANISH MACKEREL</b>										
MSY - 18.0 mill lb										
Atlantic Migratory Group	1.3 - 5.5	4								
ABC for 1989/90	4.1 - 7.4									
Atlantic Recreational			24%	960,000	4 FL	4/1/88	2,780,000	290%	12/31/88	10/3/88
Atlantic Commercial			76%	3,040,000	10 NC, SC AND GA	4/1/88	3,046,200	100%	12/30/88	12/30/88
Gulf Migratory Group	1.9 - 7.1	5								
ABC for 1989/90	4.9 - 6.5									
Gulf Recreational			43%	2,150,000	4 FL	7/1/88	790,000	37%	12/31/88	OPEN
Gulf Commercial			57%	2,850,000	10 AL, MS, LA AND TX	7/1/88	2,939,600	103%	4/7/89	4/7/89

Atlantic Recreational King Mackerel Fishery — closed 10/17/88, reopened by court order 11/15/88, closed by court order 2/23/89  
 Atlantic Commercial King Mackerel Fishery — was to close 11/23/88 but remained open by court order, closed by court order 2/23/89  
 Atlantic Commercial King Mackerel Fishery — commercial quota increased by 266,000 pounds by Secretarial Emergency Action

UPDATED TABLE PRODUCED BY SAFMC 4/20/89 BASED ON UPDATED NMFS QUOTA REPORT

Table 2

**SUMMARY OF ALTERNATIVE MACKEREL ALLOCATIONS  
(Millions of Pounds)  
FOR THE 1989-1990 FISHING YEAR**

U.S. KING MACKEREL		ALTERNATIVE			
		1*	2	3	4
Gulf King Mackerel (ABC Range: 2.7-5.8; 1988-89 TAC: 3.4)					
Fishing Year: July 1-June 30					
TAC		4.25	5.80	3.40	2.70
Recreational	68%	2.89	3.94	1.09	1.84
Commercial	32%	1.36	1.86	2.31	0.64
Eastern Zone quota	69%	0.94	0.95	0.11	0.50
Western Zone quota	31%	0.42	0.43	0.05	0.20
Atlantic King Mackerel (ABC Range: 6.9-15.4; 1988-89 TAC: 7.0)					
Fishing Year: April 1-March 31					
TAC		9.00	15.40	7.00	6.90
Recreational	62.9%	5.66	9.69	4.40	4.34
Commercial	37.1%	3.34	5.71	2.60	2.56
U.S. SPANISH MACKEREL					
Gulf Spanish Mackerel (ABC Range: 4.9-6.5; 1988-89 TAC: 5.0)					
Fishing Year: July 1-June 30					
TAC		5.25	6.50	5.00	4.90
Recreational	43%	2.26	2.80	2.85	2.11
Commercial	57%	2.99	3.70	2.15	2.79
Atlantic Spanish Mackerel (ABC Range: 1.3-5.5; 1988-89 TAC: 4.0)					
Fishing Year: April 1-March 31					
TAC		6.00	7.40	4.00	4.10
Recreational	24%	1.44	1.78	0.96	0.98
Commercial	76%	4.56	5.62	3.04	3.10

\* Preferred alternative