

APPENDIX I

REGULATORY IMPACT REVIEW
AND
DETERMINATION OF THE NEED FOR AN
INITIAL REGULATORY FLEXIBILITY ANALYSIS
FOR THE REGULATORY AMENDMENT TO THE FISHERY MANAGEMENT PLAN
FOR THE REEF FISH FISHERY OF PUERTO RICO
AND THE UNITED STATES VIRGIN ISLANDS
CONCERNING RED HIND SPAWNING AGGREGATION CLOSURES

Caribbean Fishery Management Council

August, 1996

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1.0 INTRODUCTION

Executive Order (E.O.) 12866 "Regulatory Planning and Review" was signed on September 30, 1993 and established guidelines for promulgating new regulations and reviewing existing regulations. While the E.O. covers a variety of regulatory policy considerations, the costs and benefits of regulatory actions are a prominent concern. Section 1 of the E.O. is repeated in its entirety:

Section 1. Statement of Regulatory Philosophy and Principles.

(a) The Regulatory Philosophy. Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts, and equity), unless a statute requires another regulatory approach.

(b) The Principles of Regulation. To ensure that the agencies' regulatory programs are consistent with the philosophy set forth above, agencies should adhere to the following principles, to the extent permitted by law and where applicable:

- (1) Each agency shall identify the problem that it intends to address (including, where applicable, the failures of private markets or public institutions that warrant new agency action) as well as assess the significance of that problem.
- (2) Each agency shall examine whether existing regulations (or other law) have created, or contributed to the problem that a new regulation is intended to correct and whether regulations (or other law) should be modified to achieve the intended goal of regulation more effectively.
- (3) Each agency shall identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.

- (4) In setting regulatory priorities, each agency shall consider, to the extent reasonable, the degree and nature of the risks posed by various substances or activities within its jurisdiction.
- (5) When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. In doing so, each agency shall consider incentives for innovation, consistency, predictability, the costs of enforcement and compliance (to the government, regulated entities, and the public), flexibility, distributive impacts, and equity.
- (6) Each agency shall assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs.
- (7) Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for and consequences of the intended regulation.
- (8) Each agency shall identify and assess alternative forms of regulation and shall, to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt.
- (9) Wherever feasible, agencies shall seek views of appropriate State, local, and tribal officials before imposing regulatory requirements that might significantly or uniquely affect those governmental entities. Each agency shall assess the effects of Federal regulations on State, local and tribal governments, including specifically the availability of resources to carry out those mandates, and seek to minimize those burdens that uniquely or significantly affect such governmental entities, consistent with achieving regulatory objectives. In addition, as appropriate, agencies shall seek to harmonize Federal regulatory actions with related State, local and tribal regulatory and other governmental functions.
- (10) Each agency shall avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations or those of other Federal agencies.
- (11) Each agency shall tailor its regulations to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining the regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations.

- (12) Each agency shall draft its regulations to be simple and easy to understand, with the goal of minimizing the potential for uncertainty and litigation arising from such uncertainty.

In compliance with E.O. 12866, the Department of Commerce (DOC) and the National Oceanic and Atmospheric Administration (NOAA) require the preparation of a Regulatory Impact Review (RIR) for all regulatory actions which either implement a new Fishery Management Plan (FMP) or significantly amend an existing plan, or may be significant in that they reflect important DOC/NOAA policy concerns and are of public interest.

The RIR is part of the process of preparing and reviewing fishery management plans and provides a comprehensive review of the changes in net economic benefits to society associated with proposed 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.

The Regulatory Flexibility Act (P.L. 96-353) has the purpose of relieving small businesses, small organizations, and small governmental entities from burdensome regulations and record keeping requirements. The Small Business Administration (SBA) defines a small business in the commercial fishing activity, classified and found in the Standard Industrial Classification Code, Major Group, Hunting, Fishing and Trapping (SIC 09), as a firm with receipts up to \$2.0 million annually. Additionally, the SBA defines a small business in the charter boat activity to be in the SIC 7999 code, Amusement and Recreational Services, not elsewhere classified, as a firm with receipts up to \$3.5 million per year.

To meet the basic objective of the Regulatory Flexibility Act (RFA), federal agencies are required to determine if proposed regulations will have a significant economic impact on a substantial number of small business entities and the RIR serves as the source of most of the information for the determination. However, certain information required for IRFA determinations is not necessarily available in the RIR. For example, if the RIR does not contain an estimate of the number of small businesses affected, a description of the small businesses affected or a discussion of the nature and size of impacts, then the determination section would be expanded to include such information.

Pursuant to E.O. 12866 a regulation is considered a "significant regulatory action" if it is likely to result in an annual effect on the economy of \$100 million or more or has other major economic effects. Since the annual ex-vessel value of the U.S. Caribbean fisheries is estimated to be about \$10 million, it is clear that there will not be annual effects on the economy of \$100 million or more. Therefore, these proposed measures, if enacted, would not constitute a "significant regulatory action".

2.0 PREVIOUS MANAGEMENT REGIME

The Fishery Management Plan for the Shallow-water Reeffish Fishery of Puerto Rico and the U. S. Virgin Islands (FMP) became effective September 22, 1985. The FMP (and each of the amendments) was prepared, under the authority of the Magnuson Act, by the Caribbean Fishery Management Council to establish a management system for the reef fish resources within the Exclusive Economic Zone (EEZ) and the waters under the authority of the Commonwealth of Puerto Rico and the Territory of the U.S. Virgin Islands, from the shoreline to the edge of the insular platform. Management was deemed necessary because a number of the major reef fish species were thought to be overfished.

The FMP, that went into effect in 1985, established regulation to rebuild declining reef fish species in the fishery and reduce conflicts among fishers. It established the criteria for the construction of fish traps; required owner identification and marking of gear and boats; prohibited the hauling of or tampering with another person's traps without the owner's written consent; prohibited the use of poisons, drugs and other chemicals and explosives for the taking of reef fish; established a minimum size limit on the harvest of yellowtail snapper (*Ocyurus chrysurus*) and Nassau grouper (*Epinephelus striatus*); and established a spawning season closure for Nassau grouper.

In November 1990, Amendment 1 to the FMP established the following regulations to rebuild declining reef fish species: (1) it prohibited the harvest or possession of Nassau grouper; (2) closed an area in the EEZ southwest of St. Thomas, U.S. Virgin Islands to all fishing during the spawning season for red hind (*Epinephelus guttatus*); (3) increased minimum mesh size for traps to 2 inches; (4) defined overfishing; (5) revised the section on habitat description; (6) provided for the collection of socio-economic data through federal/state agreements already in existence.

In October 1993, Amendment 2 to the FMP incorporated the major species of the deep-water reef fish fishery and the marine aquarium finfish fishery into the reef fish management unit. This action was accompanied by a change in the FMP's original title and the present FMP is known as the Fishery Management Plan for the Reef Fish Fishery of Puerto Rico and the U.S. Virgin Islands. To protect important species and rebuild declining reef fish species Amendment 2 prohibited the harvest or possession of jewfish (*Epinephelus itajara*); prohibited the harvest/possession/sale of certain species used in the aquarium trade; restricted the collection of marine aquarium fishes to hand-held dip nets and slurp guns; closed 2 additional red hind spawning aggregation areas, to all fishing, from December through February; closed a spawning aggregation area, to all fishing, for mutton snapper (*Lutjanus analis*) from March through June each year in St. Croix, U.S. Virgin Islands; and changed the criteria for the construction of fish traps.

3.0 PROBLEM STATEMENT

Recently the Council has learned of problems with the red hind seasonal area closure off Mayagüez, Puerto Rico. Although commercial fishers are aware of the importance of protecting spawning aggregations for the long-term sustainability of the fishery, they believe that the area selected for closure in 1993 is too large. Most of the area closed west of Buoy 8 (Tourmaline Bank) is not red hind preferred sea bottom (i.e., most of the bottom is sand, not coral) and thus, hinders fishers from harvesting other species that are present in the area (e.g., snappers). It is also a burden to the commercial fishers that a non-spawning area is closed when it is that same area that they have traditionally used for safe-keeping traps in times of bad weather. They keep the traps in the sandy areas rather than bringing them to shore.

The problems in the fishery (see Section II of the Regulatory Amendment) can be summarized as follows:

3.1 The area closure for red hind established in 1993 is too large and puts an unnecessary burden on the commercial fishers.

3.2 It is not possible to always distinguish red hind from other grouper species from the commercial landings statistics.

3.3 It is not possible to distinguish between daylight and night time fishing from the landings data.

3.4 Fishery-dependent data, such as cost and returns from fishing activities, which would be used to predict the reactions of fishery participants to regulations, is largely not available.

3.5 There are conflicts among the users of the resource, especially among commercial and recreational fishers.

3.6 The size of the recreational fishery is unknown.

4.0 OBJECTIVES OF THIS AMENDMENT

The objectives addressed by the Reef Fish FMP, as amended, are unchanged. These objectives are: 1) obtain the necessary data for stock assessment and for monitoring the fishery; 2) reverse the declining trend of the resource by (a) restoring and maintaining adult stocks at levels that ensure adequate spawning and recruitment to replenish the population and (b) preventing the harvest of individuals of species of high value (e.g., snappers, groupers, and others) that are less than the optimum size; 3) reduce conflicts among users of the resource; 4) promote international cooperation in managing the pan-Caribbean species; and 5) help resolve the ciguatera problem.

The proposed adjustments to the existing management structure (i.e., modifying one spawning area and adding two additional areas) is directed toward fulfilling objectives 1, 2, and 3 above. In addition, the proposed action directly addresses problem 3.1 and is in accordance with the overfishing definition in the FMP. As a way of determining whether the objectives will be met, the government of Puerto Rico is requested to expand the data collection and monitoring of spawning aggregations (for groupers and other species) through the Department of Natural and Environmental Resources.

5.0 ANALYTICAL APPROACH

The proposed regulatory amendment under consideration is designed to help meet the objective of the FMP regarding rebuilding of stocks and thus resolving the primary problem of overfishing. A combination of circumstances have led to increased levels of fishing effort over the spawning aggregations of groupers (e.g., red hind) especially at this time when the species is most vulnerable. Any changes in net economic benefits derived from the fishery depend heavily on the effect that the adjustment to the management strategy will have on the biological well-being of the stock. The biological effect of the adjustment can be used as the basis for the economic output. Analysis of the proposed adjustment will determine whether or not it contributes positively to the RIR condition of realizing a net positive economic benefit.

The analysis used in this RIR will be qualitative and will attempt to discover if the proposed action can contribute to economic improvements in the fishery, but for the most part will not attempt to estimate dollar value on the gains and losses discussed. The reason for this is that the data on the economics of the fishery is insufficient even though the biological decline of the fishery is well established.

Previous analyses of similar management measures (i.e., Amendment 2 to the Reef Fish FMP which closed two red hind spawning aggregations) was based on the assumption that the Council will close the areas to all fishing, thereby eliminating all fishing effort during the period of the closure. The RIR had determined in the case of Amendment 2 that considering all positive and negative influences on net national benefits, "the imposition of these two spawning area closures for red hind is expected to result in a long-term increase in net national benefits that exceeds the expected short-term losses."

6.0 ANALYSIS OF PROPOSED MANAGEMENT MEASURE AND ALTERNATIVES

One proposed alternative in this amendment is to reduce the size of the existing Tourmaline Bank closure to resolve problem 3.1. In addition, and since the implementation of Amendment 2, additional red hind spawning aggregations have been identified in the EEZ off the west coast of Puerto Rico. These two areas have been scientifically sampled between 1994 and 1996 and the Fisheries Research Laboratory of the DNER confirms, through fishery-independent data, the presence of spawning aggregations and spawning activity in these two areas. Further, recent public testimony indicates that fishing pressure in these areas has

increased. The best known locations, based on anecdotal information from the commercial fishers, historical productivity, and scientific research, cover a rectangular area of approximately 9 square miles each (See Figures 1, 2, and 9 in the Amendment. The three proposed alternatives are formally described below.

PROPOSED MANAGEMENT MEASURES:

Close the corresponding sections of the EEZ in all three (3) areas presented below to all fishing between December 1 and February 28 of each year. (Figure 9 in the Amendment shows all three areas as well as the original red hind area closure.)

1. Close the corresponding section of the EEZ in an area of one and a half (1.5) miles radius around Buoy 8 at Tourmaline Bank. (This is part of the area already closed but it allows for the use of the sandy area where red hinds are not found.) This area is bound by rhumb lines connecting the following point coordinates:

Point	Latitude (N)	Longitude (W)
A	18E11.2	67E22.4
B	18E11.2	67E19.2
C	18E08.2	67E19.2
D	18E08.2	67E22.4

2. Close the corresponding section of the EEZ in an area of one and a half (1.5) miles radius around Buoy 6 at Abrir La Sierra Bank. This area is bound by rhumb lines connecting the following point coordinates:

Point	Latitude (N)	Longitude (W)
A	18E06.5	67E26.9
B	18E06.5	67E23.9
C	18E03.5	67E23.9
D	18E03.5	67E26.9

3. Close the corresponding section of the EEZ in an area of one and a half (1.5) miles radius centered around a buoy to be deployed in the area known as "Bajo de Cico." This area is bound by rhumb lines connecting the following point coordinates:

Point	Latitude (N)	Longitude (W)
A	18E15.7	67E26.4
B	18E15.7	67E23.2
C	18E12.7	67E23.2
D	18E12.7	67E26.4

The analysis of these closures is based on the assumption that the Council proposes to eliminate all fishing effort from these areas during the period of the closure. This would mean the exclusion of all commercial and recreational fishing effort.

This measure provides several potential areas of benefits in the form of increased surpluses for producers, consumers and recreational fishers. It could also produce less desirable side effects that can offset at least part of the potential gains. The various potential gains and losses will probably result in a net economic benefit from this measure as discussed below.

The proposal to modify the Tourmaline Bank closure by eliminating the so-called "sandy area" should have a positive net benefit to society. According to the information in the amendment, the area to be reopened is not a red hind spawning area. Further, it has been used historically as a haven to place traps during bad weather. Since the current closure makes the trap placement illegal, the fishermen have to incur additional costs of moving traps to another location (at sea or on land), run the risk of losing traps during bad weather or run the risk of a violation. Hence, the proposed modification should reduce current fishing costs while having no major biological effects and hence no long term economic ramifications. **Therefore, the conclusion of the RIR is that the proposal to modify the Tourmaline Bank spawning area closure will result in a net positive economic benefit to society.**

The proposed closure of the two additional red hind spawning areas is a classic example of foregoing short-term gains in producer and consumer surplus in exchange for stock rebuilding that provides for larger catches in the future. In such a scenario, it can be a fairly straight forward process to determine the direction, if not the magnitude, of the change in net national benefits that is expected. This can be done if there is any information available on short-term harvesting profits (used as a rough estimate of producer surplus under an assumption of heterogeneous firms), some estimate of any predicted change in consumer surplus and an estimate of consumer surplus associated with recreational fishing trips. Then, with some information on the future yield stream, the discounted value of the surplus streams can be estimated and compared with the short-term losses.

However, in the case of the fisheries under discussion, there is no good information on the current levels or values of catches so the process cannot be followed. Furthermore, this case is somewhat more complicated than the normal case since the measure calls for a cessation of all recreational and commercial fishing activities for all species in the closure areas. Hence there is a wider class of both benefits and costs (short-term losses) associated with this type of spawning closure and these are discussed in the following paragraphs. Regardless of the complicating factors that preclude even a crude quantitative analysis, the available evidence on virtually all the species affected by the measure indicates that they are overfished and several, including red hind, are under a defined rebuilding program at the present time. The proposed spawning closures are designed to aid the rebuilding process and return some fishery value that has been lost via open-access fishing for a prolonged period of time.

Although the proposed measure is directed specifically at recovery of the red hind stock, there are obvious short term losses as well as long term benefits for all the species in the Reef Fish FMP as well as for spiny lobster.

Although the present Amendment does not contain details on the importance of these red hind spawning areas, i.e., there is no description of the percent of spawners represented by these aggregations or where the potential new recruits eventually go, there appears to be some level of agreement among those with knowledge of the fishery that these closures will result in a trend toward some stock recovery or at least a slowing of the present rate of stock decline. This should lead to benefits from the closures, even if total fishing effort does not change. The reason that total effort may not change is that fishers may elect to fish adjacent areas. Even if this occurs, additional effort in other areas may not significantly alter the total catch of fish because the present level of effort may be so high that increases (or decreases) in effort will not affect the total catch.

The possible relocation of effort just alluded to does have potential adverse consequences that are not related to the total fish catch. A "second-best" fishing strategy may simply relocate effort to other spawning aggregations (e.g., spawning areas identified in the vicinity of La Parguera). If this happens, a portion of the potential benefits from the closures will be lost due to "damage" to these other concentrations of red hind spawners.

Regardless of potential adverse consequences of the relocation of fishing effort, there appears to be some consensus that biological benefits are derived from allowing a "rest period" for any heavily fished area. Although this concept is not well articulated or quantified in the literature, this RIR assumes that such an effect exists and will not be offset by relocation of effort to other areas since the other areas are already "stressed" by the present level of effort. If this biological benefit actually exists, the effect should eventually translate into positive future economic benefits in terms of increases in producer, consumer and recreational surpluses. Another potential biological benefit derives from a body of thought that fishing on spawning aggregations may reduce spawning capability to a degree that exceeds the effect

of removing the spawners. This effect is thought to result from a disruption of the species social structure (Shapiro, et al., 1993).

The benefits (to the extent that they would actually be realized via state-federal cooperation and compliance with fishing regulations) should be more lasting than potential benefits from measures such as escape panel restrictions or other measures to regulate fishing gear. The reason for this is because even if increased overall benefits from this measure eventually attract new effort into the fishery, some of the benefits are described as being independent of total fishing effort.

This analysis assumes that the closures will not be so extensive as to halt all capture (for commercial and recreational purposes) of all species from a major portion of the waters surrounding Puerto Rico and the U.S. Virgin Islands. A total closure of all waters for a 3 month period during the height of the tourist season would undoubtedly cause major disruptions in commerce related to both commercial and recreational fishing. In such a case, the temporary dislocation of the small firms involved would probably create the need for government expenditures that may exceed the expected economic benefits related to stock recovery.

This measure will require the expenditure of funds to change the management regime and to enforce the new rules. Section 7.0 (Management Costs) contains more detail which is summarized as follows. The Council administrative costs, including public hearing costs, staff salaries, Council meetings and other relevant costs are estimated at \$19,995. Additionally, NMFS administrative costs are estimated at \$6,000 and there will be a one time cost of \$9,000 to place marker bouys in the closure areas.

While the reduction in the area of the Tourmaline Bank closure, will have no effect on enforcement costs, the addition of the two additional closed areas will. Potential sources of cost increases include expenditures by the United States Coast Guard (USCG), NMFS and the Commonwealth of Puerto Rico. However, since the USCG is patrolling these areas as part of their schedule to enforce other laws, no additional costs in terms of USCG patrols is expected from this measure. Further, no additional NMFS enforcement costs are expected. However, cooperative efforts by the government of Puerto will entail an expenditure estimated at \$11,311.

In summary, the total first year cost of the proposed action is estimated to be \$46,306.

Considering all positive and negative influences on net national benefits discussed in this section, the RIR concludes that the imposition of these two additional spawning area closures for red hind is expected to result in an increase in long term, net national benefits that exceeds the expected short-term losses plus the management costs.

REJECTED MEASURE: Close only one or two of the considered areas for three months.

The Council would not be protecting the additional spawning aggregations which have been identified and monitored. As stated previously, aggregations need protection because of the heavy fishing pressure that they experience when fish are most vulnerable to capture (that is, at reproduction) and because of the large number of ripe fish which are removed without allowing them to spawn. The sex ratio and the mating groups are disrupted when fishing takes place over the aggregations and the behavior and spawning activity might be further jeopardized. It is necessary to protect as many spawning aggregations as possible, especially since only so few have been identified around Puerto Rico and not protecting them could result in the collapse of the fishery. Protection of the maximum number of aggregations allows for a greater number of fish to spawn.

The expected economic outcome of this rejected measure is for positive economic benefits but less than the benefits expected for the measures adopted by the Council.

REJECTED MEASURE: Close the area for red hinds but allow fishing for other species.

It is not possible for fishing to take place over a red hind spawning aggregation and selectively fish for other species. Fishing gear used in these areas does not discriminate by species. Mortality of red hind will most likely be high (fish will suffer the effects of pressure) since fishery-independent data show red hinds most commonly caught at 37-90 m depth. Hence, the biological impact would be negative in the sense that not much progress relative to the status quo would be possible. It follows that there would be no or only minor economic gains. Furthermore, the enforcement costs would still exist while being difficult from a compliance standpoint. The conclusion of the RIR is that this rejected measure would result in a loss of economic benefits.

REJECTED MEASURE: No action. Keep the same area of seasonal closure as it is (Amendment 2 of the Reef Fish FMP, 1993).

Amendment Number 1 to the Reef Fish FMP contained an RIR analysis that predicted a positive economic outcome if other red hind spawning aggregations were identified and closed. Since there is no new information to the contrary, the expected economic outcome of this no action measure is for no change in economic benefit.

Other Measures Considered and Rejected:

REJECTED MEASURE: Prohibit fishing for red hind island-wide during the three months of spawning (December - February).

Red hinds are caught along with a number of other species and are caught during the period December-February outside the spawning aggregations. Fishing gear is non-selective and at present there is no way of avoiding red hinds when fishing for other reef fish species. The reef fish fishery is complex and there would be an unnecessary burden on the commercial fishers if this measure is adopted. High fishing mortality will be expected without a true benefit to the fishery and the commercial fishers. Enforcement costs would still exist and enforcement of such a measure this measure will be difficult if not impossible. The RIR conclusion is that the rejected measure would result in a loss of economic benefits.

REJECTED MEASURE: Close the three proposed areas off Mayagüez (Buoys 6 and 8, and Bajo de Cico) and establish a closed season for red hind in Puerto Rico and the U.S. Virgin Islands during December through February of each consecutive year.

The Council considers that at present this measure would cause an unnecessary extra burden to the commercial fishers in addition to the waste because of the high fishing mortality expected (due to the depths at which red hinds are hooked). No true benefit to the commercial fisher and the fishery is expected from this measure. As with similar rejected measures, the RIR determination is that there would be no benefits but costs would remain and the expectation would be for a loss in net economic benefits.

REJECTED MEASURE: Close the red hind aggregations only during daylight hours.

Red hinds are not excluded from the night-time fishing activity, but the rate of fishing mortality due to night catches has not been determined. Enforcement would be difficult and more expensive if fishing is allowed inside the closed areas. The RIR is unable to make a determination of expected economic outcome due to a total lack of information relative to the measure.

REJECTED MEASURE: Prohibit the sale of red hind during the months of the closure.

The amount of red hind caught outside the spawning aggregations or imported from other areas into Puerto Rico is unknown. Prohibition of imported red hind is not warranted at this time. The available information does not show the need for this measure at present. An RIR analysis would require more information about the specifics of this rejected measure and a determination of outcome is therefore impossible to make.

REJECTED MEASURE: Close all aggregations around Puerto Rico and the U.S.V.I.

Full details on other potential spawning aggregation locations are not available and it is difficult to provide an economic impact analysis. However, if these become known the benefits from closing all spawning grounds at the same time should exceed the benefits from the proposed measure as long as one major condition is met: the closures should not be so extensive as to halt a major portion of the capture of all species in the waters surrounding Puerto Rico and the U.S. Virgin Islands. Closing numerous areas to all fishing during the winter months, the peak months for tourism in the Caribbean, would cause major losses to the fishing industry as well as to the tourism industry (decrease in variety and numbers of fresh fish available) and to commerce in general. There is no RIR determination at this point because the number and extent of the other aggregations is unknown.

7.0 MANAGEMENT COSTS

Statement of Council Estimated Cost as of August 2, 1996

Costs associated with Council Meetings*

Estimated Cost of Council Members Compensation to one meeting ^{1*}	\$5,385
Estimated Cost of Travel Expenses to one meeting ^{2*}	<u>\$3,435</u>
Estimated Cost of Compensation and Travel Expenses	\$8,820

*Council Meetings are estimated to last 16 hours. It has been estimated that the Council devoted 16 hours (including a Reef Fish Committee meeting and the 88th Council meeting) to the changes to the Reef Fish FMP.

Time Devoted by Staff

It is estimated that the Special Assistant to the Executive Director for FMP Development and the Executive Director had dedicated thirty and fifteen percent (30% and 15%), respectively of their time during 1996 to the development of the appropriate changes to the Reef Fish FMP.

Salary of the Special Assistant 4 months at 30%	\$4,665
Salary of the Executive Director 4 months at 15%	<u>\$3,856</u>

Estimated Cost of Staff	\$8,521
<u>Public Hearings</u>	

Estimated Council Member Compensation to one-day hearing (1)	\$ 359
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^{1*} Based on average daily compensation for the years 1995 and 1996 (\$359/day including 13.75% COLA).

^{2*} Based on average per diem for Non-Foreign Areas for 1995 and 1996

Estimated Council Member Travel Expenses to one-day hearing (1)	\$ 229
Estimated Staff Members Travel Expenses to one-day hearing (3)	\$ 675
Estimated Cost of Conference Room (one hearing)	\$ 200
Estimated Cost of Announcements (one hearing)	<u>\$1,191</u>
Estimated Cost of One Public Hearing (one-day)	\$2,654
 <u>Summary of Estimated Costs</u>	
Consideration at Council Meetings	\$8,820
Time Devoted by Staff	8,521
Public Hearings	<u>2,654</u>
Total Estimated Administrative Council Cost of the Amendment to the Reef Fish FMP as of August 2, 1996	\$19,995
Estimate of National Marine Fisheries Service Administrative Cost	\$ 6,000
Cost of Marker Buoys (One-time cost for buoy life in excess of five years)	\$ 9,000
Estimate of Additional Enforcement Costs United States Coast Guard	None
National Marine Fisheries Service	None
Government of Puerto Rico:	
Educational to increase compliance	\$ 3,180
Field operations (prorated equipment, salary, per diem)	<u>\$ 8,131</u>
	\$11,311
 <u>SUMMARY OF COSTS OF FMP</u>	
Caribbean Council (Through April 22, 1996)	\$19,995
NMFS Administrative (One-time)	\$ 6,000
Marker Buoys (One-time)	\$ 9,000
Additional Enforcement Costs by PR Government	\$11,311
TOTAL FIRST YEAR COSTS	\$46,306

8.0 SUMMARY OF NET ECONOMIC BENEFIT OF THIS AMENDMENT

Table 1 follows and shows a summary of the effects on net national benefits that flow from this amendment. As explained in the analytical approach used in the RIR, most of the effects are described in terms of direction of change and it can be noted that in some cases there is not enough information available to make even this type of determination.

9.0 DETERMINATION FOR A NEED FOR AN INITIAL REGULATORY FLEXIBILITY ANALYSIS

The Regulatory Flexibility Act requires a determination as to whether or not a proposed rule has a significant impact on a substantial number of small entities. If the rule does have this impact then an Initial Regulatory Flexibility Analysis (IRFA) has to be completed for public comment. The IRFA becomes final after the public comments have been addressed. If the proposed rule does not meet the criteria for "substantial number" and "significant impact," then a certification to this effect must be prepared.

Although the number of harvesting firms fishing in the areas under consideration is not known with certainty, an estimate can be made from existing data. A 1988 survey by the Puerto Rico DNER documented that there were 882 vessels in operation in Puerto Rico. Of these, 161 operate from ports that have the potential of fishing these areas. This implies that a maximum of 18 percent of vessels would be impacted and it is doubtful that the actual number is this large because they have access to other areas and not all fish for red hind. Hence, the determination is made that the proposed rules will not affect a substantial number of small firms. Those firms that will be affected (negatively in the short run and then positively over a longer period of time) harvest a wide variety of species, including red hind. Red hind accounts for only a small portion of the annual fishery value in Puerto Rico (for example, 1.3% in 1993). Since the vessels are engaged in a multi-species fishery, and since red hind catches will be affected in only some of the spawning areas and only for three months per year, the effect on annual gross revenues is expected to be considerably less than 5%. Accordingly, there is no expectation that a substantial number of firms will be impacted by the rules and those that are affected will not be impacted by a significant amount in terms of changes in gross revenues. Therefore, an IRFA has not been prepared.

10.0 REFERENCES

Shapiro, D.Y., Y.S. Sadovy, and M.A. McGehee. 1993. Periodicity of sex change and reproduction in the red hind, Epinephelus guttatus, a protogynous grouper. Bull. Mar. Sci. 53(3):1151-1162.