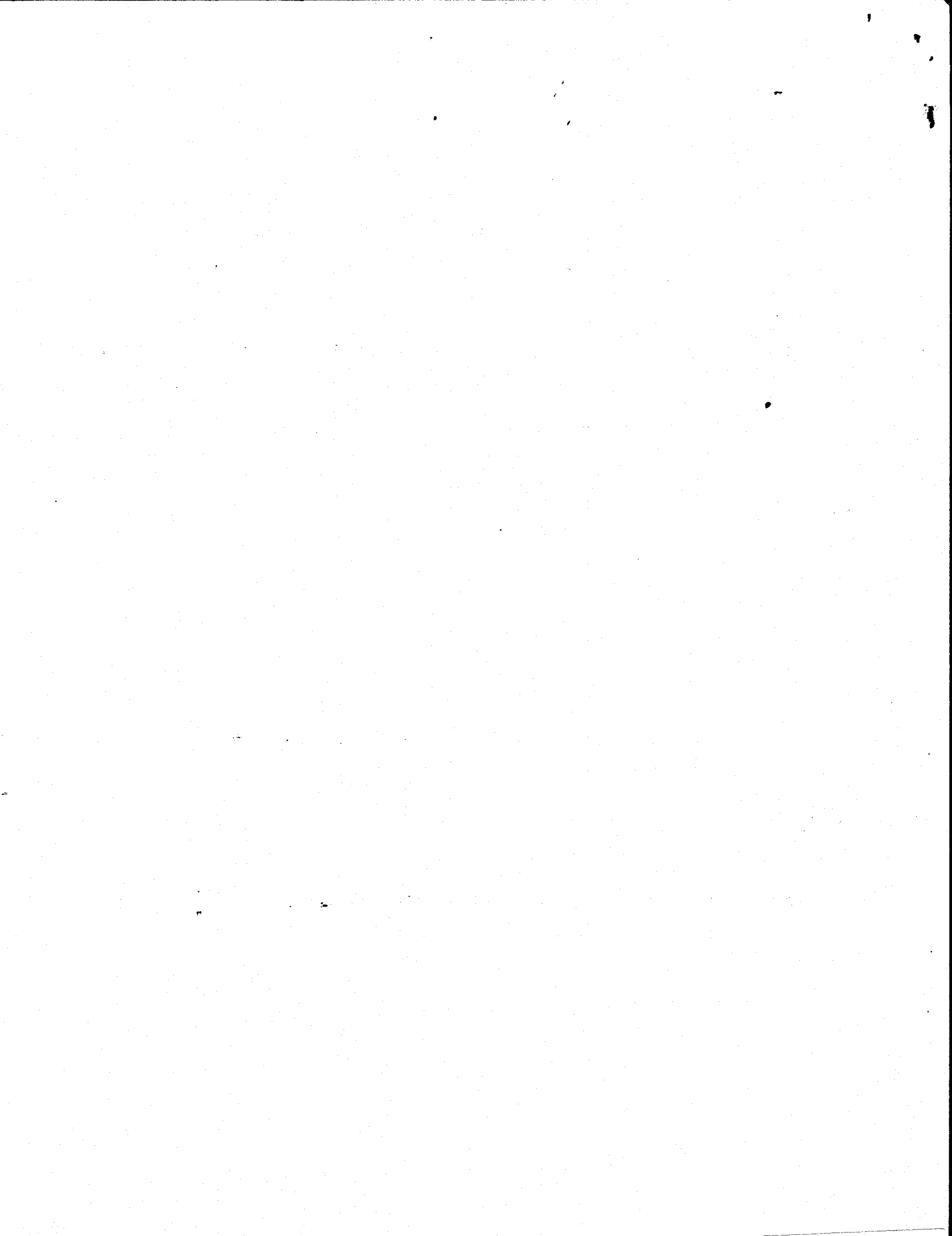


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OPTIONS PAPER**PUBLIC HEARING DRAFT****AMENDMENT 2****to the****FISHERY MANAGEMENT PLAN****for****SHALLOW-WATER REEF FISH****OF****PUERTO RICO AND THE U.S. VIRGIN ISLANDS****AUGUST 1992**

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I. HISTORY OF MANAGEMENT

The Fishery Management Plan for the Shallow-Water Reef Fish Fishery of Puerto Rico and the U.S. Virgin Islands (FMP), prepared by the Caribbean Fishery Management Council (Council) under the authority of the Magnuson Act, became effective in September 1985. The FMP established a management program for shallow-water reef fish resources within the exclusive economic zone (EEZ) of the Council's area of jurisdiction. Because the preponderance of fishery resources occur in waters under the authority of the Commonwealth of Puerto Rico and the Territory of the U.S. Virgin Islands, the management program was extended to the shoreline with agreement that the island governments would adopt compatible regulations. Some regulations are yet to be fully implemented.

The initial regulations, designed to rebuild declining reef fishes, established: (1) a minimum mesh size of 1.25 inches for fish traps; (2) requirements for degradable panels and door fasteners on traps; (3) a prohibition against hauling or tampering with another person's traps without written permission of the owner; (4) a vessel and gear identification system; (5) a prohibition on using poisons, drugs, other chemicals or explosives for taking fish in the management unit; (6) incremental size limits for Nassau grouper (Epinephelus striatus) and yellowtail snapper (Ocyurus chrysurus); and (7) a spawning season closure for Nassau grouper.

In November 1990, Amendment 1 to the FMP: (1) prohibited the harvest or possession of Nassau grouper; (2) provided for the annual closure to all fishing within a red hind (Epinephelus guttatus) spawning aggregation area in the EEZ southwest of St. Thomas; (3) defined overfishing for reef fish; (4) revised the Habitat section of the FMP; (5) increased the minimum allowable mesh size for fish traps to 2.0 inches effective September 1991; and (6) provided for the collection of socio-economic information under existing state/federal agreements. These measures were designed to guard against continued declines of Nassau grouper and red hind resources and to increase escapement of juveniles and smaller reef fishes from traps. The mesh size increase proposed for fish traps was later reduced to 1.5 inches to minimize economic impacts on the industry, while studies are conducted within the management area to more thoroughly evaluate the effectiveness of various mesh sizes and shapes. This adjustment, made under a framework provision in the FMP, provides additional protection to the resource over the previous 1.25-inch mesh size requirement. At the same time, escape panel requirements also were specified for the various allowable mesh sizes, and jute twine, no greater than 1/8 inch in diameter, was prescribed as the only acceptable fastening material for panels. Also, provisions for utilizing the access door as one of the required panels were described. The escape panels are designed to prevent continued fishing and subsequent mortality of fishes by traps that are lost (ghost traps).

II. PROBLEMS REQUIRING PLAN AMENDMENT

The actions proposed in Amendment 2 address continuing and growing concerns by the Council over scarce resources, the need to protect important species when they aggregate for spawning, and the need to extend protection to other reef-associated species not presently in the management unit. Of some 350 species of shallow-water reef fish in the Caribbean, about 180 are landed throughout the region and collectively comprise the most important fishery in the islands. The management unit currently includes the 64 most commonly landed species that dominate the catch from the shoreline to the edge of the insular platform. At greater depths at the edge of the platform, another fishery occurs -- the deep-water reef fish fishery.

Initially, the Council anticipated developing a separate FMP for the deep-water reef fish complex; however, the Council decided that it would be more practicable and economical to incorporate those species into a single management unit for all reef fish. Distribution of some of the species overlaps with the shallow-water reef fishes, although they are more abundant as adults in deeper waters. With the possible exception of red and tiger grouper, restrictive measures are not envisioned initially for deep-water species due to lack of data on the status of their populations; however, including them in the management unit permits regulatory action if necessary.

A large number of juvenile reef fishes and other small reef-associated species are taken by the marine aquarium trade

industry. A decline in abundance has been noted for some of the more desirable species in certain localities. The ecological effects of their removal are unknown, and some of the most widely used collecting methods employ chemicals that damage the reef habitat and inflict mortality upon associated fishes and invertebrates. Expanding the management unit to include marine aquarium species would obviate the need for another separate FMP and provide a mechanism to initially manage this select group of fishes under the existing drug and chemical harvest restriction. Harvest of certain species either could be regulated or prohibited as necessary. These adjustments would require changing the title of the FMP, expanding the management unit, and updating the FMP to describe the fisheries incorporated. Marine aquarium invertebrate species will be included in the Coral FMP, which currently is under development.

Following collapse of the Nassau grouper resource, the red hind became an important species in the fishery; however, statistics show a decrease in the number of young fish in the population as concluded by the Stock Assessment Group (Appeldoorn, et al., 1992). A copy of the Reef Fish Stock Assessment Report is contained in Appendix II. Whenever possible, the Council relies upon closing aggregation sites during spawning seasons to enhance reproductive capacity. Most species that aggregate during the spawning season are highly vulnerable to capture at that time. Allowing mature individuals the opportunity to spawn is important to reverse declines in

abundance. Even some fishermen have requested closure of spawning aggregation areas for red hind. A spawning aggregation area off St. Thomas, described and closed during the 1989-90 spawning season (December-February) by emergency action, has been closed during each successive spawning season under Amendment 1. Two additional red hind spawning areas are being considered for closure under Amendment 2.

A pronounced decline in the abundance of jewfish (Epinephelus itajara) has been noted throughout the management area and may extend throughout the Caribbean Basin. Similar declines in the Gulf of Mexico and off the south Atlantic coast of the U.S. led to a total prohibition on jewfish harvest in those areas. The Council believes that the jewfish should be protected throughout its range. The species appears to be scarce wherever it occurs and has unique biological characteristics that make it highly susceptible to overfishing. The U.S. Virgin Islands government has listed jewfish as a protected species, and prohibits its take in Territorial waters.

III. PROPOSED ACTIONS

(A) Management Unit.

Deep-Water Reef Fish: The deep-water fishery, primarily for reef fish, ranges from the outer reaches of the shallow-water fishery (ca. 40 fathoms) seaward to depths up to about 300 fathoms.

Fishes inhabiting the deep-water reef areas and slopes characterized by rocks, ledges, and corals generally are prosecuted with heavy duty traps and by electrically powered reels; bottom longlines are deployed to a limited extent.

Appeldoorn, et al. (1992) reported that landings of all demersal fishes in Puerto Rico declined from a peak of 2,402 metric tons (mt) in 1979 to 519 mt in 1990. During that same period, deep-water snappers, in aggregate, declined from 340 to 80 mt.

Thirteen species currently not listed in the shallow-water reef fish management unit are major components of the deep-water landings and should be added to the management unit (Erdman, 1979). One other species (tiger grouper) is added at the suggestion of the Scientific and Statistical Committee (SSC) and Advisory Panel (AP) to the Council. Six species of snapper (Lutjanidae), black snapper (Apsilus dentatus); queen snapper (Etelis oculatus), blackfin snapper (Lutianus buccanella), silk snapper (Lutianus vivanus), wenchman (Pristipomoides aquilonaris), and vermilion snapper (Rhomboplites aurorubens); four species of grouper (Serranidae), yellowedge grouper (Epinephelus flavolimbatus), red grouper (Epinephelus morio), misty grouper (Epinephelus mystacinus), and tiger grouper (Mycteroperca tigris); two jacks (Carangidae), greater amberjack (Seriola dumerili), and almaco jack (Seriola rivoliana); and two

tilefishes (Malacanthidae), blackline tilefish (Caulolatilus cyanops), and sand tilefish (Malacanthus plumieri) are taken predominantly in deep waters and should be included in the management unit. Including these species in the management unit will allow the Council to take appropriate management action as necessary to conserve or restore important components of the reef fish fishery. Other species in the deep-water fishery also are taken in the shallow-water fishery and are included in the management unit already. The most important of these are: dog snapper, mutton snapper, lane snapper, yellowfin grouper, Nassau grouper, coney, red hind, black jack, and squirrelfish. Table 1A (Appendix I) provides a complete listing of the revised management unit depicting the overlap of deep-water and shallow-water species.

Marine Aquarium Trade Fishes: A preliminary description of the marine aquarium trade was compiled by the Puerto Rico Department of Natural Resources, Fisheries Research Laboratory, for the Caribbean Fishery Management Council (Sadovy, 1991, unpublished manuscript). That report provides a description of the marine aquarium organism trade in Puerto Rico, the U.S. Virgin Islands, and other areas, including harvest methods, collection areas, handling and shipping, as well as a description and list of the most commonly collected species. The report, used as a source document for the management options considered, is appended (Appendix II). A list of the important finfishes has been

extracted from that report for inclusion in the management unit (Table 2A, Appendix I).

Export of marine organisms for the aquarium trade began ca. 1970 in Puerto Rico, and 49 species appeared on the export availability list in the early 1970's. The U.S. is the chief importer. Until recently the trade was small, but over the last two to three years collection and export activity has increased. The trade and shipping lists for 1990/91 indicate that over 150 species of fish and invertebrates were exported from Puerto Rico. Increased export activity is attributed to a combination of increased demand for marine aquarium organisms, improved air transport facilities, and increased restrictions on Florida-based collectors. Since the aquarium trade fishery is not specifically regulated and since the number of individuals of certain species harvested in the marine aquarium trade fishery appears to be declining, unrestricted harvest has become a growing concern of the Council. Many of the species collected are young of those that are valued as adults in other fisheries, some of which are regulated. Appropriate restrictions for other species would have to be addressed as necessary following data collection and analysis.

About 100 people are engaged in the marine aquarium trade in Puerto Rico and a much smaller number in the U.S. Virgin Islands. Most collectors are exporters; however, some collectors sell to exporters or to local pet shops. Currently, there are at least six export businesses in Puerto Rico.

Major collectors have their own equipment, and collect from 3-4 days to 7 days a week depending on weather and demand. Collectors visit specific areas and generally rotate collecting sites to avoid overfishing an area. Collection is commonly by SCUBA down to 20 meters but occasionally to 40 m for certain species; mask and snorkel are commonly used in shallow waters. The most frequent collecting gears are nets (barrier, gill, drop or cast nets, and dip nets), small mesh (1/4 - 1/2 inch) fish traps, slurp guns, and chemicals, such as "Quinaldine" (2-methyl-quinoline), chlorine, formaldehyde, and gasoline.

A total of 105 species or species groups of fishes appeared on trade lists and shipping lists from Puerto Rico in 1990/91 (Table 2A, Appendix I). Eighty-three species of fishes were noted as exported, and seven species, or families, accounted for over 70 percent of the total fish export. In order of decreasing numbers these were: royal gramma, Gramma loreto; yellowhead jawfish, Opisthognathus aurifrons; assorted wrasses; rock beauty, Holacanthus tricolor; assorted blennies; queen triggerfish, Balistes vetula; and French angelfish, Pomacanthus paru. Other species, such as queen angelfish (Pomacanthus ciliaris), blue chromis (Chromis cyanea), and pygmy angelfish (Centropyge argi), are less numerous but in high demand. At least 20 to 30 species taken in the marine aquarium trade also are valued as food fish. Some of these are highly prized as aquarium fish, notably rock beauty, French angelfish, and queen triggerfish; while others are being protected from overfishing as adults, such as red hind and

possibly other serranids. A wide variety of invertebrates, including corals, also are exported. The aquarium fish trade is not specifically regulated and, in Puerto Rico, exporters are not required to be licensed and collectors are not treated as commercial fishermen.

For shipping, animals are packed in plastic bags filled with oxygenated seawater and placed in heavy duty cartons. In Puerto Rico the majority are air freighted from San Juan and Aguadilla; however, occasional export occurs through the postal system (Federal Express) and United Parcel Service. Air shipments are inspected by personnel of the Puerto Rico Department of Natural Resources and the U.S. Division of Fish and Wildlife Services at the Luis Muñoz Marín airport in San Juan. On average, nine shipments a week leave Puerto Rico or 5,184 boxes per year containing an estimated 160,704 organisms. This translates roughly to the reported number of grouper (the predominant fish) landed annually by the commercial fishery in Puerto Rico. These estimates do not include shipments from Aguadilla airport.

Option 1. Expand the management unit to include the most important components of the deep-water reef fish fishery.

Discussion:

Incorporating the major components of the deep-water reef fish fishery into a single reef fish management unit with the shallow-water fishery is appealing from a cost standpoint and

because of the interrelationship between the two fisheries. Although the deep-water fishery is of less importance than the shallow-water fishery in terms of effort and landings, it includes one of the most economically valuable species, the silk snapper, Lutjanus vivanus (Matos and Sadovy, 1990). However, the relative importance of the two fisheries makes justification of a separate FMP for deep-water reef fish difficult. The cost of preparing a separate FMP would likely approach the cost of the present FMP (ca. \$200,000); whereas, added costs of consolidating the two complexes would be minor. Expanding the management unit to include the major components of the deep-water fishery also will extend the management area; and future costs would be commensurate with additional management measures that may be required eventually.

Option 1A. No action or status quo.

Discussion:

Species that are not included in an FMP cannot be managed under the Magnuson Act. Therefore, in the event that problems develop with species in the deep-water reef fish complex, substantial biomass decline and losses to fishermen could accrue before management action would be possible. It could take two years or more to develop a separate FMP, or a year or more to prepare and process an amendment to incorporate the appropriate species into the shallow-water reef fish FMP. Time lost in management translates into monetary losses to fishermen in the

long term, and such delays could add years to the amount of time required for resource recovery.

Option 2. Expand the management unit to include marine aquarium fishes (invertebrates would be managed under the Coral FMP).

Discussion:

Placing marine aquarium fishes under the protection of the reef fish rules should result in benefits to the species involved, their habitat, and collectors. Disallowing the use of chemical substances and other destructive collecting devices would reduce cryptic mortality of target and associated species while reducing a source of habitat degradation -- both results eventually would benefit the resource and collectors. The long-term stability of the fishery also would be advantaged through implementation of a permitting and reporting system and the designation of marine reserves contained in this amendment.

Option 2A. Develop a separate FMP for marine aquarium organisms.

Discussion:

The basic problem with separate FMPs for reef fish and marine aquarium organisms is that many of the species overlap both fisheries as adults and juveniles, and thus could fall under contradictory management programs. Since many species desirable in the aquarium trade are juveniles of reef fishes that are utilized for other purposes as adults, allowable harvest in one fishery may contravene selected management measures, e.g.,

spawning aggregation area closures, designed to rebuild resources in another fishery. Amendment of one FMP may require amendment of the other as well to avoid incompatible management measures, thereby increasing associated costs substantially. The likelihood of this is reduced under a single FMP. Costs associated with public hearings would at least double if an FMP were developed solely for marine aquarium organisms.

Option 2B. No action.

Discussion:

This alternative would not be responsive to the needs of the marine aquarium fishery because it would allow indiscriminate harvest of limited resources and continued damage to the habitat. Irresponsibility to the needs of a resource similarly contravenes the needs of the resource users. Allowing indiscriminate harvest and habitat damage ultimately impacts those who rely upon the resource to sustain their livelihood. If resources are not protected, competitive harvest will continue until it is no longer economically feasible and the collectors have driven themselves out of business. Other users, such as tourist dive-boat operations, also could be impacted by overexploitation and habitat damage.

(B) Gear Restrictions.

The marine aquarium trade initially will be regulated by gear restrictions designed to reduce fishing mortality and

habitat damage. Of the gears currently deployed in the harvest of aquarium fishes, two will be prohibited by existing regulations for the shallow-water reef fish fishery; i.e., the use of chemicals and small-mesh fish traps. Nets, other than hand-held dip nets, also will be prohibited by this amendment because of their potential for damaging the reef habitat and as a source of inadvertent mortality.

The commercial fishery for shallow-water (and deep-water through this amendment) reef fish basically is regulated by requiring certain construction features of fish traps -- the predominant gear in the fishery. Escape openings (covered by panels fastened with degradable material) are required to prevent continued fishing and subsequent mortality by lost or abandoned traps. Trap mesh also is being manipulated in quest of an optimum size that will allow young and immature fish to escape and grow sufficiently to maximize yield from the fishery. However, in a fishery that contains such a large number of species and wide array of body forms, there is no such thing as an optimum mesh size, especially when some of the larger species appear to be overfished.

Although gear restrictions may perform a useful function, as indicated, effort limitations eventually are necessary to reduce fishing mortality in most fisheries. Unregulated expansion of the marine aquarium trade is a growing concern of the Council and of the people involved in that industry. Trap fishermen are equally concerned that overly restrictive mesh-size

measures will eventually reduce catches to the extent that it is no longer economically feasible to fish with traps. Limitations to stabilize and reduce effort are desperately needed in both the fish trap fishery and the marine aquarium fishery. Restrictions on the number (per vessel) and size (volume) of traps are needed to control fishing capacity, coupled with the implementation of a permit (licensing) and reporting system and a moratorium on additional entry in both fisheries. Entry into the marine aquarium fishery can only be expected to increase as fishermen are displaced from other fisheries (both local and abroad), product demand increases, and export facilities improve.

Option 3. Restrict the collection of marine aquarium fishes to hand-held dip nets and slurp guns.

Discussion:

Of the traditional gear employed in the harvest of marine aquarium fishes, the Council recommended that only hand-held dip nets and slurp guns be allowed. Other gears, notably cast nets (drop nets), barrier nets (gill nets), small mesh fish traps, and chemicals, have the potential of causing damage to the resource or its habitat, or both. Chemicals and small mesh fish traps are prohibited by existing regulations.

Option 3A. Allow the collection of marine aquarium fishes by all gear types currently deployed in the fishery (status quo).

Discussion:

Some of the gears currently or traditionally used for collecting marine aquarium fishes have been shown to damage either the resource, its habitat, or both. Perhaps the most popular method of collection is by the use of chemical substances, the most common of which is quinaldine -- a coal tar derivative used in the manufacture of dyes and explosives. Although the effects of using quinaldine to stun fish are inconclusive, many dealers are reluctant to purchase fish taken by this method because mortality rates appear higher than with those collected using other methods. The use of other chemical agents, such as bleach, formalin, and gasoline, for collecting marine aquarium fishes has been reported from various areas, and all are prohibited because of their toxic effects on marine organisms, including corals. The use of chemical substances and explosives is currently prohibited by the shallow-water reef fish regulations that likewise apply to this fishery by amendment.

Cast nets (drop nets), barrier nets (gill nets), and specialized small mesh fish traps are other gears traditionally used to harvest marine aquarium fishes. These gears all have a potential for damaging reefs or reef resources. Small mesh fish traps are already prohibited under existing minimum mesh-size regulations.

Option 4. Require that fish traps be constructed with two escape openings at least 8 x 8 inches square on any two sides of

the trap (except top or bottom). The openings must be covered with panels of 2 x 2 inch mesh wire fastened with either 1/8-inch jute twine or 18 gauge ungalvanized steel wire.

Discussion:

This option would modify existing requirements by allowing a choice of sides for locating the escape openings and a choice between two fastening materials. It is more restrictive in that the minimum size of the escape opening and the material and mesh size of the panels are fixed regardless of the wire from which the trap is constructed.

Fishermen contend that locating escape openings on two opposing sides of a trap (excluding the top, bottom, and side with funnel) causes the panel opposite the side where the bridle is attached to open upon retrieval from force of the water and weight of fish, thereby releasing the catch prematurely. Locating the escape openings on adjacent sides of a trap would eliminate the problem.

Fishermen also contend that fastening the door and escape panels with jute twine is burdensome because of the amount of time required to retie the fastenings each time a trap is retrieved. They suggest use of 18 gauge ungalvanized steel wire as an alternative fastening material that could be replaced more quickly than jute. Wire fasteners, such as paper clips, could be pre-formed to snap-on instead of using jute that must be tied. However, insofar as zinc anodes are used on many traps to prevent corrosion, the life span of wire fasteners could defeat the

purpose of requiring degradable fasteners. The Council spent approximately two years coordinating studies before concluding that 1/8-inch jute twine had the most acceptable life expectancy in seawater.

Option 4A. Require only one escape panel, which should be the access door, made of 2-inch square mesh wire fastened with 18 gauge ungalvanized steel wire and located on one side of the trap. The door should be hinged at the bottom and cover an opening of no less than 8 x 8 inches.

Discussion:

This option is supported by the fishermen and the Council AP over current measures that they believe are overly restrictive. The major departures from current requirements are the single escape panel and the use of wire fasteners. Objection to the latter alternative is addressed under Option 4, above. Objection to using traps with a single escape panel was addressed in response to comments received during review of the rulemaking for existing measures. The objection was that a lost trap might be positioned so that a single panel would be obstructed or incapacitated in such a way that it would not allow fish to escape. Two escape panels (one of which may be the access door) provide more assurance against this possibility.

Option 4B. No action.

Discussion:

Current regulations require that: (1) fish traps be constructed of a minimum mesh size of 1.5-inch square or 1.5-inch hexagonal wire; (2) fish traps contain an escape port on each of two opposite sides and be covered by a panel of a mesh size no smaller than that of which the trap is constructed and fastened with 1/8-inch jute twine; (3) the access door may serve as one of the escape panels, provided it is on an appropriate side, it is hinged only at the bottom, and is fastened at the top by 1/8-inch jute twine so that the door will fall open when the twine degrades; and (4) the escape ports on traps constructed of rectangular mesh measure a minimum of 9 x 9 inches and, for hexagonal mesh, 8 x 8 inches. These measures will remain in effect until September 13, 1993, when they will be re-evaluated in light of current studies on the size and species composition of fishes taken with various mesh size traps.

Current fish trap restrictions address all of the concerns associated with continued fishing mortality being inflicted by lost traps. Those concerns are resolved by requirements that enhance the escapement of fishes from lost traps through the strategic location of panels and degradation of fasteners within a reasonable time frame. Further adjustments to optimize yield from the fishery will depend upon results of current efforts to evaluate size and species composition in traps of various mesh sizes and configurations. Appropriate changes could be accommodated after these efforts are concluded.

(C) Mandatory Permitting and Reporting.

The necessity of limiting entry into the marine aquarium fish trade was expressed by both the SSC and AP. Prior to establishing a limited access program, however, it is necessary to determine present participation at different levels within the fishery. A mandatory permitting and reporting system would accomplish this. In the marine aquarium trade there are collectors, exporters, and dealers. An individual may function in one or more of these capacities; most collectors are exporters, although some collectors also sell their catches to an exporter, or, less frequently, directly to a pet shop (Sadovy, 1991).

A permit and reporting system also is recommended for fishermen and dealers involved in the shallow- and deep-water reef fish fisheries. This system would be designed to identify the universe of participants and facilitate introduction of a limited access program in the event that one is warranted in the future. From the universe of permittees, a number will be selected to report catch/effort information and other data that are considered necessary for managing the fishery, including socio-economic data. Information also will be collected from the marine aquarium trade through existing procedures employed at export centers (airports), supplemented by other reporting requirements as deemed appropriate.

Option 5. Require an annual permit for the sale of reef fish, including marine aquarium fish.

Discussion:

An annual permit issued by the local governments would be required to sell reef fish from the management area described in the FMP. The permit system would be operated by the local governments, while NMFS would assist by screening and recommending approval or disapproval of any applicants from the U.S. mainland. A permit would be denied anyone with an outstanding violation in any fishery. Local governments would charge an appropriate fee to recover costs of administering the program.

Option 5A. No action.

Discussion:

Aquarium fish collectors and exporters are not licensed in Puerto Rico and their activities are not regulated. Although there is a licensing system for commercial reef fish fishermen in Puerto Rico, the system is not mandatory. The U.S. Virgin Islands requires permits for both fisheries; however, the vast majority of activity occurs in waters around Puerto Rico. A permit system for the entire management area is requisite to establishing a moratorium on additional entry and limited access programs for the marine aquarium trade and the commercial reef fish fishery. In the absence of an operational permitting system, new entry into either fishery could not be prevented .

Option 6. Require periodic reports from those engaged in the sale of reef fish, including marine aquarium fishes.

Discussion:

Reports would be required by the local agencies administering the permit program to more accurately determine actual participation as well as the catch and the amount of effort expended in the reef fish fishery. The data collected would allow fishery scientists and managers to better assess the status of resources in the management area and make informed judgments for conserving those resources. The data also would serve as the foundation for developing limited access programs for the reef fish fisheries. Reporting intervals and other requirements should be patterned after systems already tested and proven successful in other fisheries.

Option 6A. No action.

Discussion:

In this regard, no action would result in a continued lack of information upon which to base informed management decisions. A number of management actions and recommendations have been deferred by the Council, SSC, and AP because of insufficient data. Indecision on proper management actions would be expected to continue in the absence of current information on reef fish harvest. Information on the number of participants, amount of effort and catch is too incomplete to develop limited access

programs that are desperately needed in some segments of the reef fish fishery.

(D) Harvest Prohibitions.

Presently, there is a prohibition on the harvest and possession of Nassau grouper, and one other is proposed for jewfish in this amendment. The harvest of Nassau grouper (once the dominant species in the reef fish fishery) was not prohibited until a collapse of that resource was experienced. A prohibition against harvesting jewfish is recommended as that species now appears as only a relict of its former abundance. Generally, organisms are most common near the geographical center of their range; however, population declines have led to the closure of the jewfish fishery along peninsular Florida -- the center of abundance. A similar prohibition in the Caribbean management area is recommended under this amendment.

Options for limiting the harvest of red grouper, tiger grouper, and certain marine aquarium fishes also were examined by the Council. The Council, taking SSC and AP recommendations into account, agreed that insufficient evidence was available to prohibit the harvest of most aquarium fishes, but that the young of species under a rebuilding program should be protected until those resources recover. The Council also decided that insufficient information existed to establish a harvest prohibition on tiger grouper, but recommended the closure of a spawning aggregation area near Vieques, Puerto Rico, to all

fishing from February 1 - April 30 of each year. Insofar as red grouper is concerned, the status of the resource is uncertain in the management area. According to literature (Brownell and Rainey, 1971; Erdman, 1979; FAO, 1978), the species is abundant to the north (eastern Gulf of Mexico) and is common in Venezuelan markets to the south, but does not appear to be common in the management area. Because of the uncertainty of the status of red grouper, the Council preferred to delay any harvest restrictions until more information is collected.

Option 7. Prohibit the harvest or possession of jewfish (Epinephelus itajara) in waters around Puerto Rico and the U.S. Virgin Islands.

Discussion:

Jewfish occur off both coasts of Florida, throughout the Gulf of Mexico and the Greater Antilles, and along the southwestern Caribbean coast (FAO, 1978). A disjunct population also occurs along the Pacific coast from Costa Rica to Peru. The center of abundance is off peninsular Florida, but the species appears to be no longer abundant anywhere throughout its range. Juveniles occur primarily inshore in mangrove and seagrass areas; adults generally are taken on reefs in deeper waters.

Life history characteristics of jewfish make it extremely susceptible to overfishing and recovery from overfishing, in all likelihood, would be very slow. Jewfish grow to a large size, upwards of seven feet and 700 pounds, which makes them prime

targets for spearfishing, the chief method of harvest. The species is unique and, because of its unusual size, is esteemed by spearfishermen and by underwater photographers and divers for its aesthetic appeal. These features all combine to make jewfish a prime candidate for total protection.

Option 7A. No action.

Discussion:

Although data are inadequate for a stock assessment, the species is so scarce that likely sufficient data will never be available. Allowing continued harvest could result in the reduction of the jewfish population to a level that would require an unusually extensive time period for recovery, or result in displacement of the species altogether. This approach certainly would not be responsive to the needs of this unique resource.

Option 8. Prohibit the harvest of certain marine aquarium fishes.

Discussion:

Because of the intensifying and uncontrolled harvest of marine aquarium fishes in Puerto Rico, and based on experiences elsewhere, there is a need to regulate this fishery. By adding marine aquarium fishes to the Shallow-Water Reef Fish FMP, the harvest and possession of the young of species that presently are in a rebuilding mode would be subject to prohibition until those resources have recovered. This group currently includes Nassau

grouper, red hind, jewfish, and possibly red grouper and mutton snapper (Lutjanus analis).

The status of other species of marine aquarium fishes has not been determined, but some are uncommon while others are heavily exploited without restriction. All marine aquarium fishes will benefit from the gear restrictions contained in this amendment; however, more direct limitations on harvest (e.g., prohibitions or quotas) will not be decided until sufficient information becomes available to better evaluate the condition of various species. A permitting and reporting system to gather this vital information is recommended as part of this amendment.

Option 8A. No action.

Discussion:

While some species of marine aquarium fishes are abundant, certain species are uncommon and may be highly susceptible to overharvest. This alternative would not provide the protection this latter group deserves. It is possible that some species are already overfished while others may provide greater benefits as components of the reef ecosystem rather than being harvested. Species in short supply are usually those in greatest demand; therefore, conservation measures are needed to guard against further decline and to protect the interests of collectors/exporters dependent upon these resources for their livelihood. Conversely, users of public resources should show a willingness to cooperate in management through accurate reporting

and recordkeeping and regulatory support. Successful management programs are not possible without the understanding, trust, and a cooperative working relationship between resource users and managers.

Option 9. Closely monitor the condition of red grouper (Epinephelus morio) resources from expanded data collection efforts to determine appropriate management needs.

Discussion:

The Council has received information from resource users that the status of red grouper in the Council's area of jurisdiction may be stressed. Both the SSC and the AP indicated that existing landings and biostatistical data are insufficient to accurately assess the condition of the resource and have advised that management actions be delayed until sufficient data are available. The Council has thus concluded that any action to restrict the harvest of red grouper at this time is not warranted and that fishery data collecting agencies must increase the collection of information needed to make management decisions concerning the resource. The Council agreed.

As with jewfish and Nassau grouper, however, red grouper are so scarce that it is unlikely sufficient data will become available to accurately assess the condition of the resource in a timely manner. Therefore, allowing continued and unrestricted harvest of red grouper may not be in the best interest of resource conservation.

However, release mortality of fish taken from deep water could offset potential benefits that may be gained from a harvest prohibition.

Option 9A. Prohibit the harvest of red grouper in waters around Puerto Rico and the U.S. Virgin Islands.

Discussion:

The following account of red grouper is from Brownell and Rainey (1971:pp. 51-52):

The red grouper is a widely distributed and abundant species in the western Atlantic and Gulf of Mexico ranging from inshore out to 150 fathoms or more. We caught none around the Virgin Islands, but occasional landings have been reported from a CFDP Alcyon cruise north of Anegada (Don Erdman, pers. comm.) and by fishermen of St. Croix and Anegada. Randall (1968) lists the red grouper from St. John, Virgin Islands, but notes that this fish is not common in the West Indies. Four Alcyon cruises in the Saba-Anguilla-Barbuda region in 1970 yielded 123 individuals taken at depths from 20 to 85 fathoms (K. Kawaguchi, pers. comm.). Struhsaker (1969) describes large trawl catches of red grouper from smooth mud bottoms of the upper continental slope off the southeastern

U.S. in 85 - 152 fathoms. Bullis and Thompson (1965) report red groupers all around the Gulf from the Florida Keys to Campeche Bank, most commonly in 20 - 40 fathoms. Solis (1970) describes this species as the principal finfish in the active coastal fishery of the Yucatan Peninsula. Moe (1963) states that this is the most prevalent fish in the catches of commercial vessels on the west coast of Florida. Cervigon (1966) notes that it is the most common commercial species caught in the region of Isla Margarita, Venezuela. It is usually found on soft bottoms of mud or sand, coral rubble, or low, broken rock on gentle slopes. Red groupers feed day or night on fish, crustaceans, and octopus (Randall, 1967), and they attain a size of 50 lbs. or more.

Since this account was published, Cruise 97 of the FRS Oregon II disclosed a small number (4) of red grouper at stations occupied to the north of Puerto Rico and the U.S. Virgin Islands. The above account indicates that red grouper are generally abundant in areas to the north and to the south of Puerto Rico and the U.S. Virgin Islands. This pattern could be indicative of a sporadic distribution or of a locally depleted resource. In either case, the scarcity of this species signals a need for resource protection.

If red grouper were formerly abundant around Puerto Rico and the U.S. Virgin Islands, then the current population level could reflect that overfishing or other resource-related problems have occurred. If the low population level is a reflection of the actual distribution pattern, then continued harvest only would serve to further reduce the number present. Regardless, the conservative approach would be to prohibit further harvest to determine how the population responds. Since the species is not abundant, a harvest prohibition would have little socio-economic impact while the response of the population to this action is determined.

(E) Spawning Aggregation Area Closures.

Since a red hind spawning area in the EEZ southwest of St. Thomas was first closed on December 1, 1989, through the duration of the spawning season (February 28, 1990), the Council has attempted to identify additional spawning aggregation areas to further protect declining reef fish resources. During the spawning season, some species of reef fishes are aggressive and extremely vulnerable to capture. Protecting spawning aggregations is a sound management practice and the Council prefers spawning area closures to other approaches, such as size limits and quota management, that are more labor intensive to monitor and inflict high rates of mortality on undersized fish. Because aggregating fish are highly susceptible to capture by a wide range of gears (hook and line, trap, spears, etc.), a total ban on use of gear capable of taking fish is necessary to protect spawning aggregations.

Option 10. Closure of additional red hind aggregation areas during the December through February spawning season.

Discussion:

A spawning aggregation area has been identified in the EEZ off the west end of Puerto Rico. The area lies to the west of Tourmaline buoy, west of Mayaguez, Puerto Rico. The best known location, based on historic productivity, covers an area of approximately 3 x 5 miles. The area is bounded by rhumb lines connecting the following points (see Fig. 1, Appendix I):

<u>Point</u>	<u>Latitude N.</u>	<u>Longitude W.</u>
A	18°11'	67°25.5'
B	18°11'	67°20.4'
C	18°8'	67°20.4'
D	18°8'	67°25.5'
A	18°11'	67°25.5'

Another red hind spawning aggregation area has been identified in the EEZ east of St. Croix, U.S. Virgin Islands, at the extreme eastern end of Lang Bank. The area is bounded by rhumb lines connecting the following points (see Fig. 2, Appendix I):

<u>Point</u>	<u>Latitude N.</u>	<u>Longitude W.</u>
A	17°50.4'	64°28.5'
B	17°50.7'	64°25.8'
C	17°49.5'	64°25.5'
D	17°48.3'	64°26.0'
E	17°47.4'	64°27.5'
A	17°50.4'	64°28.5'

Option 10A. No action.

Discussion:

Leaving the identified areas unprotected from intensive fishing effort could lead to the demise of the spawning aggregations, and declines in local abundance, at least to the extent that local populations of red hind are dependent on these aggregations. No action definitely would contribute to a continued decline of the red hind resource.

Option 11. Prohibit the harvest of mutton snapper (Lutianus analis) in a spawning aggregation area off St. Croix from March through June of each year.

Discussion:

Mutton snapper are taken in insular shelf waters at depths of 1-50 meters by traditional hook-and-line and fish-trap methods. Commercial landings indicate that mutton snapper have been fished to the extent that production is declining. This species forms large spawning aggregations near the time of the full moon from March through June and is prone to overfishing during this period (Tobias, 1986).

A mutton snapper spawning aggregation area has been identified in the EEZ off the southwest coast of St. Croix. In keeping with the Council's management preferences, the U.S. Virgin Islands, Division of Fish and Wildlife, has recommended that the area be closed to all fishing from March through June of each year to protect the species. The spawning area is bounded by rhumb lines connecting the following points (Fig. 3, Appendix I):

<u>Point</u>	<u>Latitude N.</u>	<u>Longitude W.</u>
A	17°37.9'	64°52.6'
B	17°38.2'	64°52.1'
C	17°38.3'	64°51.8'
D	17°38.1'	64°51.4'
A	17°37.9'	64°52.6'

Option 11A. No action.

Discussion:

Mutton snapper appear to be especially vulnerable to harvest when aggregated for spawning. This has prompted the curtailment of fishing activity during the spawning season in waters under the jurisdiction of the South Atlantic Council and similar action soon will be contemplated by the Gulf of Mexico Council. To allow spawning populations to be overexploited during periods of unusual vulnerability is not a biologically sound practice.

Option 12. Recommend that the local government close a spawning aggregation area for tiger grouper (Mycteroperca tigris) in waters near Vieques Island to all fishing from February 1 through April 30 of each year.

Discussion:

In July 1991 the Council recommended that the government of Puerto Rico take appropriate action to protect a spawning aggregation of tiger grouper in waters near Vieques. The National Marine Fisheries Service added its support to the proposed closure, recognizing that protection of spawning aggregations is an effective management tool and is preferred by

the Council over measures that induce high rates of mortality (size limits) or that are difficult and costly to monitor (size limits and quotas).

Placing tiger grouper in the management unit paves the way for cooperative management to protect this species in waters under federal jurisdiction. Should Puerto Rico decide upon closing the spawning aggregation area off Vieques, the Council may close adjoining areas or other spawning aggregation areas as deemed necessary to protect the resource. According to the AP, the tiger grouper is a deep-water species that does not enter traps and usually spawns in shallow waters but at depths beyond the range of divers (140 - 150 feet). Based on observations by Sadovy (pers. comm.), the species aggregates for spawning at about 120 feet and is targeted by several spearfishermen. Consequently, tiger grouper may be more abundant than records indicate. Closing the spawning aggregation area off Vieques may have severe and unwarranted economic impacts on local fishermen and their families. (Council should attempt to identify these impacts during public hearings.) Also, Council should attempt to resolve apparent conflicts between AP (Rivas letter) and Sadovy report that disagree on harvest method and depth. The AP recommended immediate protection of the spawning aggregation while studies are pursued to determine abundance.

Option 12A. Prohibit the harvest and possession of tiger grouper in waters around Puerto Rico and the U.S. Virgin Islands.

Discussion:

The tiger grouper occurs from Florida and Campeche Bank southward through the West Indies to the northern coast of South America in coral reef areas from the shoreline to depths of at least 30 meters. Although reports (FAO, 1978) indicate a general distribution throughout the range and that the species "commonly" reaches a length of 40 cm. (16 inches), there is no information on local abundance around Puerto Rico and the U.S. Virgin Islands. Information on abundance within the management area, as indicated by both the SSC and AP, is requisite to formulating a position on harvest limitations.

Option 12B. No action.

Discussion:

Resources that rank low on the scale of relative abundance are particularly subject to depletion through unrestricted harvest. Both the harvest prohibition and spawning aggregation area closure would favor increasing the size of the tiger grouper population; however, neither the SSC nor the AP believed that there was sufficient information to support a harvest prohibition. Even though the Council has adopted spawning aggregation area closures as a preferred management tool, it would be difficult to support such a measure in the absence of evidence that indicated low or declining resource abundance. However, the aggregation should be monitored closely to detect any significant changes in abundance.

(F) Marine Reserves and Other Measures.

Tropical coral reefs are the basic component of several important fisheries in the management area of the Caribbean Council and establishing a number of them as marine reserves is a worthy concept. The most important coral reef resources are: shallow-water reef fish, spiny lobster, marine aquarium organisms (including corals and other invertebrates), and deep-water reef fishes. Except for spiny lobster and coral, these resources would be managed under the Reef Fish FMP. Balancing the traditional consumptive fisheries for these species with alternate uses of reef resources, such as ecotourism, sport diving, and aesthetics, is one of the most difficult challenges facing fishery managers. The potential of marine fishery reserves was addressed by the Reef Fish Plan Development Team of the South Atlantic Fishery Management Council (1990).

Coral reefs are highly complex ecosystems and support a diversity of species. The ecology and life history characteristics of many reef fishes make them particularly vulnerable to overfishing, such as slow growth rates, long life, late maturity, spawning aggregation behavior, and sex reversal. Larger individuals generally are targeted and are aggressive and disposed to high fishing mortality. The basic habitat itself is composed of living organisms, some of which are highly prized by collectors and others that are highly susceptible to sedimentation or other forms of degradation. The development and maintenance of marine coral reef reserves will require

coordinated efforts by state and federal managers. Establishing reserves could benefit the resources and fishery managers in numerous ways.

Option 13. Establish marine coral reef reserves in strategic locations within the management area.

Discussion:

Although the coral reef per se is the basic unit of, the proposed marine reserves, the concept of marine coral reef reserves cross-cuts the objectives of different FMPs and should be included as a measure in each FMP affected along with supporting rationale. In their review of proposed management options for Amendment 2, both the SSC and the AP encouraged pursuing the development of marine reserves, recognizing that the number and extent of such areas and designation of their use would require cooperation by local and federal governments.

The benefits that may be derived from marine coral reef reserves under Amendment 2 would be distributed among shallow- and deep-water reef fish resources, marine aquarium fishes, and their habitats. Marine reserves would: (1) serve as a gene pool or spawning stock reservoir to prevent depletion of fisheries by ensuring recruitment to surrounding areas; (2) strengthen the success of the reef fish management program; (3) decrease the urgency of utilizing other management actions; (4) establish a baseline for evaluating management actions in nearby areas; and (5) provide natural reef communities for educational and research

sites. Marine reserves could contribute substantially to rebuilding overfished reef fish resources and guard against overfishing of others.

Option 13A. No action.

Discussion:

If marine coral reef reserves are not established, a greater mix of other management measures may be required to achieve the benefits outlined above. These include, but are not limited to, more restrictive gear measures, reductions in effort, and possibly seasonal or periodic (pulse fishing) closures.

Option 14. Prohibit the unauthorized introduction of exotic species into marine waters.

Discussion:

According to Courtenay, et al. (1991), 47 exotic species of finfishes are listed as established in the continental United States. These species became established accidentally or with human assistance through escape or release from aquaculture facilities, introduction for biological control or sport fishing, and release of aquarium fish. Although most of these species are confined to freshwater, others are euryhaline and adapt readily to the oceanic environment. Some marine species, such as Lutianus rasmira, also have been transplanted successfully (Oda and Parrish, 1981). Unauthorized introductions of exotics, whether deliberate or accidental, could result in biological

catastrophes such as the displacement of more desirable species from their niches, or adverse modification of the genetic composition of the desirable species.

Most states, including Puerto Rico and the U.S. Virgin Islands, regulate the introduction of exotic species. Extending the prohibition into federal waters would serve to support and strengthen state regulation, and implicate the Magnuson Act as a further deterrent to violation.

Option 14A. No action.

Discussion:

Releasing incompatible species in marine waters could result in increased competition for food and space coupled with genetic incongruity. Such discord may favor displacement of desirable species or uncontrollable population expansion of less desirable species.

Option 15. Retitle FMP to cover the expanded reef fish management unit.

Discussion:

Since the management unit has been enlarged to include fishes other than shallow-water reef fish, the Council suggests the document be retitled, "Fishery Management Plan for Reef Fishes of Puerto Rico and the U.S. Virgin Islands." This title accurately describes the fisheries for shallow-water reef fish, deep-water reef fish, and marine aquarium fishes.

There are no direct social or economic benefits or impacts associated with changing the title of the FMP.

Option 15A. No action.

Discussion:

Retaining an inaccurate title for an FMP could result in confusion to managers and, more importantly, to the fishermen responsible for conforming to the regulatory program tailored to the conservation of reef resources.

IV. Overfishing and Rebuilding Schedule

By definition, a reef fish stock or stock complex is overfished when it is below the level of 20 percent of the spawning stock biomass per recruit (SSBR) that would occur in the absence of fishing (see Regulatory Amendment to this FMP, dated July 1991).

The Nassau grouper is currently considered to be overfished. Although a quantifiable SSBR cannot be determined because of the paucity of available data, total landings have declined to the point where this once abundant species in the landings rarely occurs. The harvest of Nassau grouper is prohibited under Amendment 1 to the Shallow-Water Reef Fish FMP, and will remain so until the species has recovered to a level of 20 percent SSBR.

Red hind (now one of the most prevalent species in the landings) are being harvested at less than optimum size. The average size and production of mutton snapper also appear to be declining. These conditions are contrary to objective 2b of the FMP: "Prevent the harvest of individuals of species of high value (e.g., snappers, grouper, and others) which are less than the optimum size."

Many species of reef fish, including those mentioned above, aggregate in geographically limited areas for spawning. Instead of employing quotas and other methods that are difficult to monitor and cause excessive mortality of juveniles, the Council prefers spawning area closures as a management tool. Protection

of spawning aggregations is a practical way to reduce fishing mortality at a time when fishing effort is the most intensive and CPUE is the highest. Protection of these areas will also increase the likelihood of spawning success. The benefits of the closure of spawning areas could depend, however, on the extent that fishing effort and catch are increased during the remainder of the year.

Because of the vagaries of the condition of reef resources and the uncertainties associated with the available data, it is difficult to specify a definitive time frame for the recovery of overfished species. The many divergent characteristics of reef fish, especially those associated with age, growth, and size at maturity, make it difficult to establish rebuilding time frames with any degree of precision. The rebuilding plan must ensure that sufficient numbers of males are produced in protogynous species, thus increasing the likelihood of spawning success. It takes several years (more than ten in many cases) for females to become males. Thus, the Council has specified a range of 10 to 15 years as a reasonable target for rebuilding those species that are currently overfished.

Jewfish, tiger grouper, and red grouper may never have been abundant in the management area. Although overfishing may not be a factor influencing their limited population size, the Council has a responsibility to protect those resources from overfishing. The Council favors a conservative approach to manage these species, and their harvest will be regulated to prevent damage to

the existing low spawning stock biomass. The Puerto Rico Department of Natural Resources has agreed to protect the spawning aggregation areas for tiger grouper that have been identified in territorial waters. This should afford added protection to the tiger grouper population.

TO ALL PERSONS INTERESTED IN THE FISHERIES
AROUND PUERTO RICO AND THE U.S. VIRGIN ISLANDS

The Caribbean Fishery Management Council will hold public hearings during the month of December to obtain comments on the Amendment 2 to the Shallow-Water Reef Fish FMP for Puerto Rico and the U.S. Virgin Islands. Attached is a summary of the proposed management measures. If approved by the U.S. Secretary of Commerce, these will become regulations during 1993.

In addition, the Amendment has a recommendation to the Government of Puerto Rico for the closure of the tiger grouper (Mycteroperca tigris) spawning area, in waters near the Island of Vieques. The area would be closed to all fishing from February 1st through April 30 each consecutive year. It must be understood that this is only a recommendation and that at this time the Government of Puerto Rico has indicated that it is not necessary to close said area, but that the fishery should be monitored to obtain the necessary elements of judgement to manage the fishery when required.

Each one of the pertinent documents to the Second Amendment (Draft Environmental Impact Statement, and the Regulatory Impact Review, among others) will be sent, by request, to interested persons.

The comment period will end on January 25, 1993. For further information please contact the Council's office.

A TODA PERSONA INTERESADA EN LA PESCA EN AGUAS ALREDEDOR DE PUERTO
RICO E ISLAS VIRGENES AMERICANAS

El Consejo de Administración Pesquera del Caribe se propone llevar a cabo vistas públicas durante el mes de diciembre para obtener comentarios sobre la Segunda Enmienda al Plan de Manejo para Peces de Arrecife de Aguas Someras para Puerto Rico y las Islas Vírgenes Americanas. Acompañamos un resumen de las medidas de manejo propuestas, las cuales entrarán en vigor durante el año 1993, si éstas fueran aprobadas por el Secretario de Comercio de los Estados Unidos.

En adición, la Enmienda contiene una recomendación al Gobierno de Puerto Rico, para que se cierre una de las áreas en donde desova el mero diente de sable, conocido en inglés como "tiger grouper" (Mycteroperca tigris), en aguas cercanas a la Isla de Vieques. El área estaría cerrada a toda pesca desde el 1ro de febrero hasta el 30 de abril de cada año. Debe entenderse que ésta es solamente una recomendación y que el Gobierno de Puerto Rico en estos momentos ha indicado que no es necesario cerrar dicha área y que sí se debe dar seguimiento a esta pesquería, de forma que se tengan los elementos de juicio para manejar la misma cuando fuese necesario.

Cada uno de los documentos pertinentes a la Segunda Enmienda (Borrador de Declaración de Impacto Ambiental y Revisión de Impacto de Reglamentación, entre otros) están disponibles en la Oficina del Consejo y se le enviarán por correo a los que así lo interesen.

El período de comentarios termina el 25 de enero de 1993. De necesitar mayor información, favor dirigirse a la Oficina del Consejo Pesquero.

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
CARIBBEAN FISHERY MANAGEMENT COUNCIL
SUITE 1108, BANCO DE PONCE BLDG.
HATO REY, PUERTO RICO 00918-2577

NOTICE OF PUBLIC HEARINGS

The Caribbean Fishery Management Council (CFMC) will hold public hearings on the Amendment 2 to the Shallow-Water Reef Fish FMP. The Amendment proposes the following measures:

- (1) Expand the management unit to include: a) the most important components of the deep-water reef fish fishery, and (b) marine aquarium fishes;
- (2) Restrict the collection of marine aquarium fishes to hand-held dip nets and slurp guns;
- (3) Require that fish traps be constructed with two escape openings at least 8 x 8 inches square on any two sides of the trap (except top or bottom). The openings must be covered with panels of 2 x 2 inch mesh wire, fastened with either 1/8 inch jute twine or 18-gauge ungalvanized iron wire;
- (4) Require an annual permit for the sale of reef fish, including marine aquarium fish;
- (5) Require periodic reports from those engaged in the sale of reef fish, including marine aquarium fishes;
- (6) Prohibit the harvest or possession of jewfish (Epinephelus itajara) in waters around Puerto Rico and the U.S. Virgin Islands;
- (7) Prohibit the harvest of certain marine aquarium fishes (such as juveniles of commercially important species);
- (8) Closure of additional red hind spawning aggregation areas during December through February spawning season, as follows:
 - (a) One area in the EEZ, west coast of Puerto Rico, covering 15 square miles (3 x 5 miles) which is bounded by rhumb lines connecting the following points:

DEPARTAMENTO DE COMERCIO FEDERAL
ADMINISTRACION NACIONAL OCEANICA Y ATMOSFERICA
CONSEJO DE ADMINISTRACION PESQUERA DEL CARIBE
SUITE 1108, EDIFICIO BANCO DE PONCE
HATO REY, PUERTO RICO 00918

AVISO DE VISTAS PUBLICAS

El Consejo de Administración Pesquera del Caribe celebrará vistas públicas sobre la Enmienda 2 al Reglamento del Plan de Manejo para los Peces de Arrecife de Aguas Someras. La enmienda propone las siguientes medidas:

- (1) Ampliar la unidad de manejo para incluir: a) los segmentos más importantes de la pesquería de arrecife de aguas profundas y (b) los peces para acuarios marinos;
- (2) Prohibir la captura de peces para acuario con equipo que no sea redes de mano y equipo de succión (hand-held dip nets and slurp guns);
- (3) Disponer que las nasas para peces sean construidas con dos paneles de escape con una apertura de no menos de 8 x 8 pulgadas cuadradas, en cualquiera de los dos lados de la nasa (excepto en el tope o el fondo). Las aperturas deben estar cubiertas con paneles de alambre cuya malla sea de 2" x 2", atados con yute de 1/8 pulgada, o alambre "sin galvanizar" de hierro número 18 ("18-gauge");
- (4) Requerir un permiso anual para la venta de peces de arrecife, incluyendo los peces para acuarios marinos;
- (5) Requerir informes periódicos a las personas dedicadas a la venta de peces de arrecife, y peces para acuarios;
- (6) Prohibir la captura o posesión del mero batata (Epinephelus itajara) en aguas alrededor de Puerto Rico y de las Islas Vírgenes Americanas;
- (7) Prohibir la captura de ciertos peces para acuario (como los juveniles de especies comercialmente importantes);
- (8) Cierre a toda pesca en áreas adicionales a las ya establecidas, durante el período de desove del mero cabrilla, desde diciembre hasta febrero, según se describe a continuación:
 - (a) Area en la Zona Exclusiva Económica (EEZ, por sus siglas en inglés) en la costa oeste de Puerto Rico, con un total de 15 millas cuadradas (3 x 5 millas) demarcadas por líneas de rumbo que enlazan los siguientes puntos:

<u>Point</u>	<u>Latitude N.</u>	<u>Longitude W.</u>
A	18°11'	67°25.5'
B	18°11'	67°20.4'
C	18°8'	67°20.4'
D	18°8'	67°25.5'
A	18°11'	67°25.5'

- (b) Another spawning area in the EEZ, east of St. Croix, U.S. Virgin Islands, at the extreme eastern end of Lang Bank, which is bounded by rhumb lines connecting the following points:

<u>Point</u>	<u>Latitude N.</u>	<u>Longitude W.</u>
A	17°50.4'	64°28.5'
B	17°50.7'	64°25.8'
C	17°49.5'	64°25.5'
D	17°48.3'	64°26.0'
E	17°47.4'	64°27.5'
A	17°50.4'	64°28.5'

- (9) Prohibit the harvest of mutton snapper (Lutjanus analis) in a spawning aggregation area off St. Croix, from March through June of each year. The area is in the EEZ off the Southwest coast of St. Croix, U.S. Virgin Islands, and is bounded by rhumb lines connecting the following points:

<u>Point</u>	<u>Latitude N.</u>	<u>Longitude W.</u>
A	17°37.9'	64°52.6'
B	17°38.2'	64°52.1'
C	17°38.3'	64°51.8'
D	17°38.1'	64°51.4'
A	17°37.9'	64°52.6'

- (10) Establish marine coral reef reserves in strategic locations within the management area.
- (11) Prohibit the unauthorized introduction of exotic species into marine waters.
- (12) Retitle the FMP, to "Fishery Management Plan for Reef Fishes of Puerto Rico and the U.S. Virgin Islands," to cover the expanded reef fish management unit.

<u>Punto</u>	<u>Latitud N.</u>	<u>Longitud O.</u>
A	18°11'	67°25.5'
B	18°11'	67°20.4'
C	18°8'	67°20.4'
D	18°8'	67°25.5'
A	18°11'	67°25.5'

- (b) Otra área de desove en la Zona Económica Exclusiva, está al este de Santa Cruz, Islas Vírgenes Americanas, en el extremo este de Lang Bank, demarcada por líneas de rumbo que enlazan los siguientes puntos:

<u>Punto</u>	<u>Latitud N.</u>	<u>Longitud O.</u>
A	17°50.4'	64°28.5'
B	17°50.7'	64°25.8'
C	17°49.5'	64°25.5'
D	17°48.3'	64°26.0'
E	17°47.4'	64°27.5'
A	17°50.4'	64°28.5'

- (9) Prohibir la pesca de sama (Lutjanus analis) en un área en las afueras de Santa Cruz, durante el tiempo de desove (de la especie), desde marzo hasta junio de cada año. El área se encuentra en la Zona Económica Exclusiva, en la costa suroeste de Santa Cruz, Islas Vírgenes Americanas, y está demarcada por líneas de rumbo que enlazan los siguientes puntos:

<u>Punto</u>	<u>Latitud N.</u>	<u>Longitud O.</u>
A	17°37.9'	64°52.6'
B	17°38.2'	64°52.1'
C	17°38.3'	64°51.8'
D	17°38.1'	64°51.4'
A	17°37.9'	64°52.6'

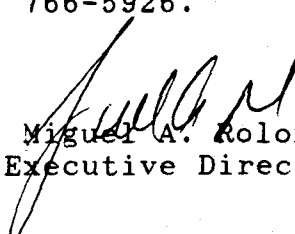
- (10) Establecimiento de reservas marinas de corales, en puntos estratégicos dentro del área de manejo.
- (11) Prohibir la introducción no autorizada, en el mar, de especies exóticas.
- (12) Cambiar el título actual del Plan por "Plan de Manejo para Peces de Arrecifes de Puerto Rico e Islas Vírgenes Americanas", para incluir especies adicionadas a la unidad de manejo.

The schedule of the public hearings is as follows:

Monday	December 21	Salón Bahía, Parador Villa Parguera, La Parguera, Lajas, Puerto Rico;
Tuesday	December 22	Conference Room, Fisheries Research Laboratory, Department of Natural Resources, Road 102, Km 8.6 Interior, Punta Arenas (Joyuda) Cabo Rojo, Puerto Rico;
Wednesday	December 23	El Mesón Criollo, Road 987 Km 3.2, Las Croabas, Fajardo, Puerto Rico;
Monday	December 28	Conference Room, Legislature Building, Charlotte Amalie, St. Thomas, U.S.V.I.;
Tuesday	December 29	Conference Room, Legislature Building, Christiansted, St. Croix, U.S. Virgin Islands.

Interested persons are invited to submit comments not later than January 25, 1993.

For additional information, please contact the Caribbean Fishery Management Council, Suite 1108, 268 Muñoz Rivera Ave., Hato Rey, Puerto Rico, or at telephone (809) 766-5926.


Miguel A. Rolon
Executive Director

December 4, 1992

El itinerario para las vistas públicas será el siguiente:

Lunes	21 de diciembre	Salón Bahía, Parador Villa Parguera, La Parguera, Lajas, Puerto Rico;
Martes	22 de diciembre	Salón de Conferencias, Laboratorio de Investigaciones Pesqueras, Depto. de Recursos Naturales, Carr. 102, Km 8.6 interior, Punta Arenas (Joyuda) Cabo Rojo, Puerto Rico;
Miércoles	23 de diciembre	El Mesón Criollo, Carr. 987 Km 3.2, Las Croabas, Fajardo, Puerto Rico;
Lunes	28 de diciembre	Salón de Conferencias,, Edif. Legislatura, Charlotte Amalie, St. Thomas, Islas Vírgenes Americanas;
Martes	29 de diciembre	Salón de Conferencias, Edif. Legislatura, Christiansted, St. Croix, Islas Vírgenes Americanas.

Se invita a pescadores y demás personas interesadas a someter comentarios no más tarde del 25 de enero de 1993.

Para más información puede comunicarse con el Consejo de Administración Pesquera del Caribe, Muñoz Rivera 268, Suite 1108, Hato Rey, Puerto Rico 00918; teléfono (809) 766-5926.


Miguel A. Rolón
Director Ejecutivo

4 de diciembre de 1992