

APPENDIX III

**FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR THE
FISHERY MANAGEMENT PLAN FOR QUEEN CONCH RESOURCES OF
PUERTO RICO AND THE
UNITED STATES VIRGIN ISLANDS**

Caribbean Fishery Management Council

June, 1996

COVER SHEET

RESPONSIBLE AGENCIES: Caribbean Fishery Management Council
National Marine Fisheries Service

TITLE OF PROPOSED ACTION: Fishery Management Plan for Queen Conch Resources of Puerto Rico and the U.S. Virgin Islands

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ABSTRACT:

The Caribbean Fishery Management Council (Council) is proposing a Fishery Management Plan (FMP) for the Queen Conch Resources of Puerto Rico and the U.S. Virgin Islands. The management program is designed to address the impacts of human activities on the condition of queen conch resources and to respond to the rapidly declining fishery for this species. The FMP will prohibit the possession of queen conch less than 9 inches in length or 3/8-inch lip thickness; require that all conch be landed in the shell; prohibit the sale of undersize queen conch and queen conch shells; establish a closed season, during the peak reproductive period, between July and September each year; prohibit the use of HOOKAH gear for harvesting conch in the EZZ. Restrictions on landings are as follows: a maximum of 150 conch per day can be landed by licensed commercial fishers; a maximum of 3 conch (not to exceed 12 per boat) can be landed by personal-use fishers. The FMP also recommends permitting, reporting and monitoring to improve data collection. The EIS explores the environmental consequences of the proposed actions, and alternative measures, and considers the possible economic impacts of limited harvests and restricted gear on commercial harvesters of queen conch resources. Habitat degradation and its effect on recruitment is discussed. The importance of pan-Caribbean cooperation in the management of the queen conch resource is also discussed.

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+For list of acronyms see Draft FMP for Queen Conch (p. v).

1.0 PURPOSE AND NEED

The Caribbean Fishery Management Council is aware of the continuous decline of queen conch (Strombus gigas) resources in Puerto Rico and the U.S. Virgin Islands, as well as in other areas of the Caribbean. The Council wants to stop the declining trend in the queen conch fishery and manage the fishery for long term sustainable yields. There are a number of factors affecting the status of the fishery. Among these are: the declining trends in commercial landings, overfishing has been determined for various areas, the decrease in the spawning populations or in egg mass production in some areas, the increase in diving depth in search of the resource (because it is no longer economically feasible to fish in shallow water) albeit the dangers involved in deep water SCUBA diving, the high demand for the product and increase in price per pound over time, the increase in conch imports, the demand for the conch shells, the increase in recreational boating (i.e., causing damage to habitats from anchoring) and recreational fishing (taking of juveniles for the shells and meat), the degradation of water quality and critical habitat required for juvenile settlement (e.g., seagrass beds), and the lack of management for the fishery. Individually or combined, these factors have induced the collapse of the queen conch fishery in places such as Florida and Cuba. The collapse of the fishery in the fringe areas of Florida and Bermuda was such that recovery has not been possible in spite of a total closure of the fishery. Therefore, from these previous experiences the Council believes that 'taking no management action' in the U.S. Caribbean might result in total collapse of the fishery as it has happened in other fisheries. In the U.S. Caribbean commercial fishing extinction (economic) has already been observed in the drastic declines in the Nassau grouper and Jewfish resources (see Reefish FMP, 1985;1993).

In response to documented trends in the decline of the fishery for queen conch, the Council is proposing a conservative set of management measures for the U.S. Caribbean. The proposed measures are compatible with regulations in place for the territorial waters of the U.S. Virgin Islands, which have set a precedent for the management of the fishery. In addition, compatible regulations are being drafted by the DNER for the waters of Puerto Rico. These management measures are proposed to stop, if not reverse the declining trend. The Council believes that these management measures can rebuild the queen conch resources and contribute to the long-term maintenance of a healthy fishery. The Council has two other FMPs implemented in the U.S. Caribbean. These are the Spiny Lobster FMP (1981) and the Reefish FMP (1985). All the species managed under these two plans overlap with the queen conch in management regime and habitat. An FMP for Corals and Reef Associated Plants and Invertebrates (1993) has recently been approved.

Although regulations are promulgated for federal waters, the FMP considers the entire range of the species under management. Therefore, the Plan serves for compatible regulations and/or international management of the queen conch. The Council is responsible for managing resources in the federal waters surrounding Puerto Rico and the

United States Virgin Islands. The area extends from the inner boundary of the EEZ (that is, 10.35 nm isopleth for Puerto Rico and 3 nm isopleth for the U.S.V.I.) to the 200 nm outer boundary of the EEZ. In addition to the geographical management area for the proposed measures it is recommended that efforts be made to achieve pan-Caribbean cooperation in the management of the queen conch resources. One important reason for this recommendation is that the queen conch larvae settling in the U.S. Caribbean might be supplied by the spawning population from other areas of the Caribbean.

MANAGEMENT OBJECTIVES

Objective 1. To optimize the production of queen conch in waters surrounding Puerto Rico and the U.S. Virgin Islands through implementation of a management program, while ensuring the conservation of those resources throughout their range and in a manner consistent with other management programs currently in effect.

Objective 2. To reduce adverse impacts on queen conch through regulation of fishing effort and wasteful harvest practices, such as harvesting immature and reproducing individuals and exhausting deep water spawning reserves.

Objective 3. To promote the adoption of functional management measures that are practical and enforceable from the standpoint of conservation, in terms of education in general and the promotion of international cooperation in managing queen conch resources.

Objective 4. To generate a data base that will contribute to the knowledge and understanding of queen conch biology and other elements needed to improve management efforts, such as SAFE reports, monitoring of the resource, and determination of recruitment sources.

Objective 5. To recommend habitat improvements to federal and local governments and other entities responsible for curbing environmental degradation and loss.

Objective 6. To provide as much flexibility as possible within the management program to ensure that actions occur on a timely basis and in a manner consistent with the involved interests.

ISSUES TO BE CONSIDERED
OVERFISHING - How can we reduce direct and indirect harvests of resources (e.g., juveniles, spawning stocks)?
ECONOMIC IMPACTS - What are the effects of limiting harvest by commercial and recreational fishers and what are the benefits to other users?
HABITAT LOSS - What is the effect of continued degradation of habitat (e.g., Seagrass beds) on commercial fish stocks and threatened and endangered species?
MONITORING & ENFORCEMENT - How can we improve the opportunities for effective monitoring and enforcement of conservation rules?
INEFFICIENT UTILIZATION - How can we reduce mortality of juveniles, spawning stocks and other conch species?
INADEQUATE INFORMATION - How can we improve the data base for more effective management of queen conch resources?
REGIONAL MANAGEMENT - What is the best way to ensure a consistent management regime for the U.S. Caribbean?

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The following management measures (proposed actions) are intended to address the management objectives discussed above. Each management measure has a number of alternatives that have been considered by the Council.

"Option A" is intended to represent the preferred alternative by the Council.

MANAGEMENT MEASURE 1A: Prohibit the possession of undersized queen conch less than nine (9) inches total length (22.9 cm) (as measured from the tip of the spire to the distal end of the shell) or with less than a 3/8-inch (9.5 mm) lip thickness measured at the thickest point of the lip. Queen conch less than nine (9) inches total length will be considered illegal if it does not have at least one area of the shell lip measuring 3/8-inch. All species in the fisheries management unit must be landed still attached to the shell.

Size restrictions serve two purposes: protection of spawning stock and/or maximization of yield-per-recruit (YPR). In general, restrictions on harvesting juveniles (see Management Measure 2A) also will tend to increase the YPR. The idea of protecting the species' spawning stock assumes that the insular platform is large enough to ensure significant self-recruitment, which is probably true in some areas (Appeldoorn, 1988; see discussion under Section 2.3 of the FMP). In addition, the FMP provides for the initiative of promoting similar conservation measures in other countries in the Caribbean. The queen conch resource is shared by all the Greater Antilles and most Lesser Antilles, as well as countries in Central and South America (Figure 1 of FMP).

In searching for an adequate minimum size, the Council discussed a seven, eight, and nine-inch minimum size. A nine (9) inch total length minimum size would practically close the fishery in those areas where adult populations are smaller. For example, in Puerto Rico small size populations are found on the shelf around Caja de Muerto Island and the area of La Boya in Cabo Rojo. The majority of the queen conch in these areas mature at less than 9 inches total length. This would result in an unnecessary loss of yield and an additional economic burden for the fishers of that area. However, the smaller size of the conch in an area should not be discarded as an indication of the overexploited, overfished condition of that area. An area such as Caja de Muerto is fished by commercial fishers from Ponce, Peñuelas, Juana Díaz, and Salinas and also frequented by recreational boaters that account for an unknown take of queen conch. The seven (7) inches total length would not imply a severe economic hardship on the commercial fisher; however, it does not ensure spawning of a larger percentage of the queen conch population. The eight (8) inches total length limit was discussed (see alternative 1B) as the minimum size for Puerto Rico because it would, in the short term, have the least impact on users while providing some protection to the species.

Size at maturity is very variable in queen conch, however it is not so in terms of lip thickness. Thus, the management measure also includes a lip thickness minimum size. The shell of the queen conch will grow in length until it reaches sexual maturity. At that time there is a change in growth, the shell then thickens instead of increasing in size. Hence, in those areas where the average size, at maturity, of the population is smaller than 9 inches, the 3/8-inch lip thickness determines which conch can be legally landed. This 3/8 inch lip thickness limit results in a large per cent of the organisms spawning at least once.

A minimum size of 9 inches is what the fishers of St. Croix have used and the U.S.V.I. have made into law. The fishers have expressed that this measure will not have a significant economic impact, while it will ensure spawning.

The measure states, for enforcement purposes, that the fishers will have to land the conch species in the shell. This brings about an impact on the land site where the shells will be deposited. The fishers of St. Croix are already landing conch in the shell and disposing of the shells on the shoreline. There have been reports of problems with this practice. Among these, the bad odors from the decomposing viscera left inside the shell and the unattractiveness of the mounds of shells left behind. It is also true that the shells are being collected, cleaned and sold to tourists at various prices depending on the quality of the shell (R. Adams, pers. comm.).

This requirement might make fishers less efficient, since they will not be able to land as many pounds of queen conch meat (average meat yield is 33% of total weight). However, this requirement is necessary because of the great variability inherent in the shell-to-meat ratio. This variability precludes the establishment of an effective minimum allowable landing-weight per animal. If the meat is taken under water, there is no protection of juveniles since they would have been killed already (they must be sacrificed to obtain the meat).

ALTERNATIVE 1B: Establish a less restrictive minimum size limit of seven (7) or eight (8) inches total length for queen conch.

The CFMC also considered size limits of seven and eight inches, as nine inches would practically eliminate a fishery in areas such as the shelf around Caja de Muerto Island and Culebra in Puerto Rico, where most conch mature at less than nine inches total length (Appeldoorn, 1994). This would result in a reduction in yield, thereby increasing the economic burden on fishers in those areas. Fishers in such areas might not have access to other areas where conch mature at nine inches. The variability between populations probably reflects the conditions of the environment where they grow. Establishing a nine-inch minimum size ensures greater spawning potential through recruitment of larger individuals in the gene pool, thereby guarding against a genetic shift towards a fishery composed of smaller individuals. The less restrictive size limits would not ensure spawning of the majority of the population.

ALTERNATIVE 1C: Establish a minimum size limit for queen conch of eight (8) inches in Puerto Rico and nine (9) inches total length in the U.S. Virgin Islands.

The differential size limit between Puerto Rico and the U.S. Virgin Islands was proposed by the fishers in St. Croix (where most of the conch are harvested in the U.S. Virgin Islands) and supported by the U.S.V.I. Division of Fish and Wildlife. St. Croix fishers

contended that a nine-inch minimum size would not create a significant economic impact and would ensure spawning.

Differential size limits, however, would open an enforcement loophole, the extent of which cannot be ascertained. Fishers could catch eight-inch conch in the U.S. Virgin Islands and land them in Puerto Rico. If this occurred extensively, spawning potential of the U.S. Virgin Islands stock could be reduced. (See also discussion on Alternative 1B above.)

ALTERNATIVE 1D: Control the harvest size of queen conch through meat count size (2 uncleaned or 3 cleaned to the pound) rather than shell length.

This method was used in St. Croix and was seriously considered by the Council as a replacement measure to overall shell length. Variability in meat weight due to cleaning practices as well as variability of meat size as related to shell size, precluded adopting this alternative in lieu of shell length and lip thickness. Also, immature queen conch could be landed as other species of gastropods if meats were allowed to be removed from the shell. Besides, the conch must be sacrificed before it can be determined whether the weight of a particular meat meets the specified criteria.

ALTERNATIVE 1E: No Action.

The consequences of taking "no action" would result in the continued declining trend observed in the commercial landings. If this trend continues, it will most likely result in stock depletion. Recovery of the collapsed fishery would be unlikely, as exemplified by other areas. Continued harvest of undersized and immature individuals would eventually and substantially diminish recruitment. "No action" would not be responsive to the problems in the fishery.

MANAGEMENT MEASURE 2A: Prohibit the sale of undersized queen conch and queen conch shells as defined.

There is reason to believe that recruitment overfishing is occurring in some localized areas of the Caribbean. Not only is the taking of juvenile queen conch unknown (in terms of numbers taken) but also the details of the early juvenile stages in the wild are unknown to scientists. In addition, the critical habitat for juvenile queen conch is being lost. Habitat degradation is a problem in many areas and contributes significantly to the status of a fishery. Nursery areas are disappearing and this represents a problem in term of recruits to the population (R.S. Appeldoorn, pers. comm.). The presence of conspecifics in the settlement and nursery areas might be requisite for continuous use of the area by queen conch larvae and juveniles.

In addition to this measure being complementary to the previous size limit measure it is also recommended as an additional control. If the undersized conch or conch shells are not banned from the landings, the enforcement of the size limit management measure could be jeopardized.

ALTERNATIVE 2B: No Action.

The rationale underlying this prohibition is to discourage a black market for products made illegal through the size limit. Development of a black market for these products could hamper enforcement of the minimum size requirements. Taking "no action" in this case would result in less noticeable benefit to the fishery.

MANAGEMENT MEASURE 3A: Establish a bag limit for personal-use fishers of three (3) queen conch per day, not to exceed twelve (12) per boat; licensed commercial fishers may land one hundred and fifty (150) queen conch per day for the first year. The commercial fishers' quota will be lowered to one hundred (100) queen conch for the second year and to seventy-five (75) the third year. The quota reduction is subject to review upon receipt of empirical information on which to base the decisions for new limits. All conch harvested under these provisions must conform to minimum size specifications and be landed still attached to the shell.

Recent information obtained from the Fisheries Research Laboratory (DNER, PR) shows a decline in the total numbers of conch meat pounds landed per trip since 1988. The average trip in 1988 netted 86 lb/trip for two fishers. In 1993, each single trip averaged 59 lbs. This decrease in catch per trip with an increase in effort is a sign of overfishing. The total pounds landed per trip amount to approximately 260 pounds of conch (shell + animal) per trip (conversion factor: average meat yield is 33% of the total weight). The bag limit of 150 per licensed commercial fishers yields approximately 50 lbs of cleaned conch meat per fisher. Landing the conch in the shell will allow for undersized queen conch to be returned to the water unharmed. This measure also allows for the ability to conduct at-sea enforcement.

A bag limit of seventy five (75) queen conch per commercial fisher was established in the U.S.V.I. on April 26, 1994. The commercial fishers requested and were granted an increase in the limit to 150 conch per licensed commercial fisher per day.

The management measure includes a program for reducing the bag limit to 100 conch per commercial fisher on the second year and to 75 for the third year. This quota reduction will be reviewed upon receipt of additional information.

ALTERNATIVE 3B: Establish a bag limit for personal-use fishers of six (6) queen conch per day, not to exceed twenty-four (24) per boat; licensed commercial fishers may land seventy-five (75) queen conch per day. All conch harvested under these provisions must conform to minimum size specifications and be landed still attached to the shell.

These less restrictive personal-use bag limits and more restrictive commercial landing limits were considered by the Council, but were rejected. There is no information on the numbers of recreational fishers harvesting queen conch and no data available on the recreational harvest of queen conch in the U.S. Caribbean.

The more restrictive bag limit for the commercial fishers has already been rejected in the U.S.V.I.

ALTERNATIVE 3C: No Action.

The magnitude of the recreational harvest is unknown. The data gathered from the commercial landings is not detailed enough and still little is known about the effort involved, but the information available shows a declining trend in the fishery. Additionally, decreasing densities of queen conch have been reported in the U.S.V.I. Friedlander et al. (1994) show that the average density of queen conch decreased from 37 conch/ha in 1981 to 11 conch/ha in 1990. The "No Action" would imply not recognizing the existing problem of an important fishery in the Caribbean, and let it become commercially extinct. Allowing indiscriminate harvest of an overfished resource could result in a complete collapse of the fishery. No action undermines the rebuilding efforts put forth in the FMP and diminishes the possibility of maintaining the stock in the long run.

MANAGEMENT MEASURE 4A: Establish an annual closed harvest season from July 1 through September 30 for queen conch.

Closure is aimed at protecting the spawning stock at the peak of their spawning activity. Although queen conch are reported to spawn throughout the year, it has been scientifically shown that there is a peak in the spawning activity during the months of the proposed closure. This measure might also decrease effort, depending on how fishers allocate their time. Fishers reduce fishing effort during this time because it is the hurricane season. However, the statistics show that during this time of the year landings increase, probably because of the migration of the conch to shallower waters to spawn. Thus, with less effort, shallower depths and closer to shore fishing grounds, harvest increases. This argues for a definite closure during this time of the year and for the long-term benefit of protecting the spawning stock rather than the short-term benefit of increasing yield over such short period of time.

Enforcement is not expected to be a problem because the measure can be implemented at dockside and/or at sea. It is unlikely that fishers will be able to stockpile considerable numbers of queen conch during the closure, based on experiences in Belize (Appeldoorn, 1988). Although an economic burden will be imposed on the commercial fishers for a short period of time (3 months), the long term benefits expected from protecting the spawning stock outweigh the impact of the seasonal closure.

ALTERNATIVE 4B: No Action.

A closure during the reproductive period may serve to reduce overall fishing mortality, especially if conch are more vulnerable to harvest at that time. Efforts to protect spawners may advance the rebuilding schedule, insofar as recruitment is localized; whereas attempting nothing will delay rebuilding efforts, if not elimination of any possibility of stock recovery. Therefore, the "No action" is not responsive to deteriorating resource conditions.

MANAGEMENT MEASURE 5A: Prohibit the harvest of queen conch in the EEZ using HOOKAH gear. Any person with queen conch and HOOKAH gear aboard a vessel in the EEZ will be presumed in violation of this prohibition.

Total prohibition of HOOKAH gear will not result in a complete closure of the fishery in the EEZ. This will not, at this time, create an excessive economic hardship on the fishers since most fishers in Puerto Rico and the U.S.V.I. use SCUBA gear and since at present most fishing is done in the shallower fishing grounds which are in territorial waters. Those fishers that use HOOKAH exclusively (number unknown) and who depend on queen conch only or on queen conch and lobster and are fishing in the EEZ (number unknown) will be directly affected by this measure. However, it is not known how many of the 151 full-time conch fishers, in Puerto Rico, and of the 20 in St. Croix (as reported by Mr. Daniel Matos, DNER, PR and Mr. Williams Tobias, DPNR, U.S.V.I.) use HOOKAH, exclusively. These fishers would be eliminated from the fishery, if they can not free or SCUBA dive to those depths. There is no need for a total closure of the fishery if other management measures are implemented. There are no compatible regulations in the U.S.V.I. or in P.R. regarding this management measure. This will apply only to federal waters. Thus, in terms of enforcement, if a fisher is found in the EEZ with HOOKAH gear and queen conch on board, the enforcement agent presumes the conch were harvested in violation of this regulation. The burden of proof is on the fisher.

Without other regulations, this measure could lead to selective fishing in shallow areas where juveniles dominate. This could lead to serious growth-overfishing and reduced number of conch surviving to maturity.

ALTERNATIVE 5B: Prohibit the harvest of queen conch in the EEZ using SCUBA gear.

This measure would effectively close the queen conch fishery in the EEZ. Protection could be afforded to the deep water populations of queen conch. However, there is no assessment of these deep water populations and the measure is considered to be too restrictive. The Council shall revise this measure as appropriate when the data are collected and analyzed.

ALTERNATIVE 5C: Prohibit SCUBA gear in waters less than 35 feet deep.

There are no federal waters this shallow. This type of management measure would be very difficult to enforce. In addition to fishing mortality there are indications of habitat degradation and loss in nearshore areas due to anthropogenic activities such as pollution, recreational boating anchoring, etc., which might be detrimental to settling queen conch juveniles.

ALTERNATIVE 5D: No Action.

The "No Action" alternative will result in the worsening of the declining trend observed in the fishery. SCUBA and HOOKAH gear allow for increased bottom time, at the risk of danger to the diver as depth increases. The increase in bottom time results in increased harvesting, most likely of the spawning population which returns to deeper water after spawning.

Commercial fishers are already exploiting deep water populations at depths over 100 ft as the shallow areas became depleted, while there is an incentive to continue fishing to increase or maintain the level of income from the fishery. Not much is known about the populations of conch at these depths. The description of some of the individuals found at these depths - thick shell, little and tough meat - fits the description of older individuals. Conch can live upwards of 40 years, but it is not known if these individuals constitute a viable spawning stock. It is also not known if these stocks can provide the larvae needed inshore to maintain shallower water populations.

POSSIBLE FUTURE ACTIONS

It is the goal of this FMP that the queen conch resource be managed through its entire range. The management measures in the FMP are mostly compatible with the U.S. Virgin Islands regulations of April 26, 1994 and amended on July 12, 1994, for harvesting queen conch. Compatible regulations are expected from Puerto Rico in the near future. Since, at this time most of the commercial and recreational harvesting of queen conch takes

place in state waters, and since most juveniles of the species settle in territorial waters, cooperation from the states is essential for the successful management of the resource. Recommendations put forth in the FMP/EIS for Corals and reef associated plants and invertebrates are pertinent to the present FMP. Specifically those concerned with curtailing the detrimental effects of anthropogenic activities on the near shore environment (e.g., pollution effects on seagrass beds). Please refer to those documents for further details.

Solutions to the problems of the queen conch fishery include the protection and conservation of critical habitat. Specifically, sea grass beds associated with clean sandy areas are habitats of importance in the recruitment of queen conch juveniles. There is the need to collect quantitative data on the effect of, for example, recreational boating activity on the health of seagrass beds. The effect might be direct such as the damage cause by anchors by uprooting the plants or indirect such as the effect of the re-suspended sediment in increasing the turbidity of the water and thus affecting water quality and ultimately the plants themselves.

The following recommendations are made in the FMP for future consideration:

1. Establish a permitting system for the commercial and recreational harvesting of queen conch.
2. Establish mandatory reporting from commercial and recreational harvesters of queen conch.
3. Establish a monitoring program and expand data collection efforts.

Throughout the text, the CFMC encourages the protection and conservation of critical habitat for the juvenile and adult queen conch.

3.0 AFFECTED ENVIRONMENT

The Queen Conch FMP provides a description of the resource (Section 2), and a description of the fishery and catch and capacity descriptors (Section 3).

Description of the Resource

Species in the FMU

The FMP establishes management measures for the queen conch, Strombus gigas. The FMU includes other species which are or could be harvested along with queen conch. There is no need at present to establish management measures for any other of these

species in federal waters. These species are found mostly in territorial waters. However, all species in the FMU are required to be landed still attached to the shell. This requirement enhances enforcement of the size limits and allows for undersize conch to be returned to the water alive. Following is a partial list of the common names of the species in the FMU: (See Table 1 of the FMP for a more detailed description and species listings).

1. queen conch
2. milk conch
3. West Indian fighting conch
4. roostertail conch
5. hawkwing conch
6. whelk

Some of the species in the FMU are marketed with the queen conch (e.g., milk conch, West Indian fighting conch) or marketed for their shells (e.g., roostertail conch). There is an overlap in the habitat utilized by some of the species but not necessarily during the same life cycle stage.

Description of Fishery

Section 3 of the Queen Conch FMP provides a complete description of the fishery. Following is a summary of this information:

History of Exploitation

Historical data on queen conch shows that the resource was of importance before the discovery of the New World. Landings statistics however only date back to the 1960's when fishing was done while skin diving or using a long pole with a hook and catching it from the boat. In the 1970's the use SCUBA for harvesting queen conch began, and has increased since. Approximately 90% of the conch landings reported for Puerto Rico were by SCUBA.

Commercial Fishing

Landings data have been analyzed for Puerto Rico and the U.S.V.I. (see Section 3.3 of the FMP). The declining trend in landings (i.e., from over 400,000 pounds in 1983 to about 100,000 pounds in 1992, in Puerto Rico), along with additional data such as the finding of none or 1 egg mass (1983-1985) in a heavily fished area in Puerto Rico are indicative of a problem in the fishery. Landings per trip have been declining in Puerto Rico since 1988 (from 86 to 59 lb of conch meat/trip). That overfishing of local conch resources is

a problem is also substantiated by the increase in imports of conch into Puerto Rico since 1986. The situation in the U.S.V.I. was more critical than in Puerto Rico resulting in closure of the fishery in St. Thomas for 5 years. Average densities of conch per hectare decreased in the U.S.V.I. from 37 to 11 from 1981 to 1990. Unfortunately, there were no regulations in place when the fishery re-opened. However, regulations are in place now in the U.S. Virgin Islands.

The commercial fishing for conch is currently done using SCUBA gear at average depths of 100 feet. Fishers dive mostly every day, weather permitting, and use between 2 and 4 tanks per fishing trip per diver. Most fishing trips include 2 or 3 fishers. Gonzalez Román (1991) reported that diving accidents (bends) have increased among commercial fishers and that 10 out of 37 divers have been paralyzed after the accident. Because of the depth fishing is done and the number of tanks that are used per diver, problems with the safety of the divers are increased. The major concern and problem being decompression sickness (bends).

Recreational and Non-Consumptive Uses

There is no information available on the recreational harvest of the queen conch resources. Anecdotal information from recreational divers attests to the observed problem of overfishing. Areas where recreational skin divers used to collect 2 or 3 conch have no conch at present. However, there is no information on the size of the conch seen or harvested by recreational divers. The number of recreational divers has increased (see FMP for Corals and Reef Associated Plants and Invertebrates) as shown for example by the increase in numbers of SCUBA diving schools. Also, shell collection and recreational boating have increased considerably.

Fishery Habitat

A primary economic value of marine habitats lies in their importance to commercial fisheries, including fish, conch and lobster. As stated in the Queen conch FMP, possible overfishing might be a result of the degradation and loss of essential habitat for juvenile settlement and development. There is information presented on the FMP which makes it clear the importance of seagrass beds found near coral reefs as nursery grounds for the queen conch. Protection and conservation of these essential habitats is of critical importance. The value of the commercial fisheries (for all species including the queen conch) might be used as an indicator of the value of the habitat (for example seagrass beds) since most commercial species use seagrass beds during some part of the life cycle.

Status of the stock

An attempt was made to calculate Maximum Sustainable Yield (MSY) for the queen conch fishery of the 1970's. Great changes in the fishery such as increased use of SCUBA and the not well documented but noticeable increase in effort have resulted in a continuous decline of the resource (see Tables 2, 3, and 4 of the FMP). The MSY values are thus no longer valid for today's fishery since there was no, and still there is not, good information on effort.

OY is defined in the FMP as all queen conch commercially and recreationally harvested from the EEZ landed consistent with management measures set forth in the FMP under a goal of allowing 20% of the spawning stock biomass to remain intact. This definition of OY and the management measures proposed should serve to protect both the juveniles and the spawning population of queen conch and to prevent overfishing in areas still not fully exploited. Additionally, habitat conservation concerns are addressed, as recommendations, to the local governments regarding the rehabilitation and conservation of near shore habitat critical for recruitment and reproduction of the queen conch.

The greatest benefit to the Nation is derived from the long term effects that the management measures will have on the resource. That is, rebuilding of the stock and long term sustainable yields. The Council believes that the proposed management measures ensure the best use of the resource allowing fishing to continue.

Other Conch

Information is scant regarding natural abundance, sustainable harvest levels, or actual level of current harvest for the other species in the FMU. There is almost no commercial harvest of whelk in Puerto Rico since the resource appears to have been overfished. Regulations are in place in the U.S.V.I. where there still appears to be a viable fishery.

EFFECT OF MANAGEMENT MEASURES 1-5 AND THEIR ALTERNATIVES:

1. SIZE LIMIT ALTERNATIVES

ISSUES	NO ACTION	9" SL; 3/8" LT LANDED IN SHELL	7" or 8" SL	PR 8" SL USVI 9" SL	MEAT-SIZE RATIO
OVERFISHING	Continuing adverse impacts	Lessens problem	Long term negative impact	Creates problems with enforcement	Continuing adverse impacts
ECONOMIC IMPACTS	Long term adverse impacts	Long term improves	Depress net benefits	Depress net benefits	Lessens impact on harvesters
HABITAT LOSS	No effect	No effect	No effect	No effect	No effect
MONITORING & ENFORCEMENT	No effect	Enhances enforcement	No effect	Creates problems with enforcement	Creates problems with enforcement
INEFFICIENT UTILIZATION	Continuing adverse impacts	Eliminates problem	Continuing adverse effects	Continuing adverse effects (PR)	Continues adverse impacts
INADEQUATE INFORMATION	No effect	No effect	No effect	No effect	No effect
REGIONAL MANAGEMENT	Probably continuing adverse effects	Improves	No effect	No effect	No effect

SL = SHELL LENGTH
 LT = LIP THICKNESS

PR = PUERTO RICO
 USVI= UNITED STATES VIRGIN ISLANDS

2. NO SALE OF UNDERSIZED QUEEN CONCH OR QUEEN CONCH SHELLS

ISSUES	NO ACTION	PROHIBIT SALE OF SMALL CONCH
OVERFISHING	Continues adverse effects	Lessens adverse impacts
ECONOMIC IMPACTS	Long term negative impact on commercial harvester	Long term benefit to commercial harvesters. Unknown effect on curio trade
HABITAT LOSS	No effect	No effect
MONITORING & ENFORCEMENT	No effect	Improve enforcement
INEFFICIENT UTILIZATION	Continues adverse impacts	Positive benefits
INADEQUATE INFORMATION	No effect	No effect
REGIONAL MANAGEMENT	Continues adverse impacts	Positive impacts

3. BAG LIMITS

ISSUES	NO ACTION	3 CONCH PERSONAL USE FISHERS* / LAND IN SHELL 75 CONCH COMMERCIAL FISHERS / LAND IN SHELL	3 CONCH PERSONAL USE FISHERS* / LAND IN SHELL 150 CONCH COMMERCIAL FISHERS / LAND IN SHELL
OVERFISHING	No effect	No effect	No effect
ECONOMIC IMPACTS	No effect	Relatively large impact on commercial sector	Negative change in net commercial benefits
HABITAT LOSS	No effect	No effect	No effect
MONITORING AND ENFORCEMENT	No effect	Enhanced enforcement at sea	Enhanced enforcement at sea
INEFFICIENT UTILIZATION	No effect	No effect	No effect
INADEQUATE INFORMATION	No effect	No effect	No effect
REGIONAL MANAGEMENT	No effect	Some benefit	Some benefit

* Unknown effect of personal use harvest limits.

4. ANNUAL SEASONAL CLOSURE

ISSUES	NO ACTION	ANNUAL CLOSURE (JULY-SEPTEMBER)
OVERFISHING	Continuing adverse impacts	Lessen adverse impacts
ECONOMIC IMPACTS	Long term negative impact	Long term benefits
HABITAT LOSS	No effect	No effect
MONITORING AND ENFORCEMENT	No effect	Easier to enforce
INEFFICIENT UTILIZATION	Continue adverse impact	Long term benefits
INADEQUATE INFORMATION	No effect	No effect
REGIONAL MANAGEMENT	No effect	Positive effect

5. GEAR RESTRICTION ALTERNATIVES

ISSUES	NO ACTION	NO SCUBA <35 FEET	NO SCUBA	NO HOOKAH
OVERFISHING	Continuing adverse impacts	Lessens adverse impacts	Major improvement	Minor improvement
ECONOMIC IMPACTS	Loss by accidents	Minor impact	Major impact on commercial fishers	Minor impact on commercial fishers
HABITAT LOSS	No effect	No effect	No effect	No effect
MONITORING AND ENFORCEMENT	No effect	Not easily enforceable	Easier to enforce	Easier to enforce
INEFFICIENT UTILIZATION	Continuing adverse impacts	Improve	Major improvement	Improves
INADEQUATE INFORMATION	No effect	No effect	No effect	No effect
REGIONAL MANAGEMENT	No effect	No effect	Positive benefits	Positive benefits

TABLE I. PROPOSED ACTIONS* AND THE FMP'S OBJECTIVES

OBJECTIVES	1	2	3	4	5
/ Optimize production of queen conch	++	++		++	++
/ Reduce adverse impacts on queen conch	++	++	+	++	++
/ Promote functional management (practical)	++	++	+	++	+
/ Generate data base	+			+	
/ Recommend habitat improvement					
/ Provide flexible management	+	+	+	+	

*** MANAGEMENT MEASURES:**

- 1-** Prohibit possession of queen conch less than 9 inches or 3/8" lip thickness.
- 2 -** Prohibit the sale of undersized queen conch and queen conch shells.
- 3 -** Bag limit of 3 for recreational and 150 for commercial fishers of conch/day.
- 4 -** Establish annual closed season.
- 5 -** Prohibit use of HOOKAH gear for harvesting queen conch.

+ denotes positive impact

4.0 ENVIRONMENTAL CONSEQUENCES

(A) Size Limits

Biological Effects

Protection is afforded to juveniles (Management Measures 1 and 2) and assurance that the vast majority of the stock will reach sexual maturity (Management measures 1 and 2) and spawn. Yield is enhanced when only large individuals become part of the catch and long term catches of queen conch can be expected when recruits are allowed continuously into the fishery. There are environmental and physical oceanographic conditions which contribute to the recruitment variability but over which there can not be much control. If recruitment variability is a consequence of the condition of the resource in other areas, cooperation among Island Nations of the Caribbean needs to be pursued. Nearshore environments also need to be preserved for the continued use of these habitats (seagrass beds) as nursery grounds for the queen conch. The critical habitats for queen conch, specifically seagrass beds, are vulnerable to pollution and sedimentation. As discussed in the FMP, there is not much quantitative information on the effect of fishing activities, boating activities, etc. on the condition of the habitat. (See the section entitled "Possible Future Actions" above.) However, fishing pressure will be alleviated from the nearshore habitats where most juveniles occur. Thus, any physical damage caused by the directed fishing of queen conch in these areas will be curtailed.

The best available scientific data indicate that size limits (shell length or lip-thickness) will force a favorable response in the population. The alternative sizes of 7 and 8 inches are not efficient in protecting the majority of the conch. The meat-size ratio requires that conch be removed from the shell and can not be returned unharmed to the water if it is undersized.

The FMP requires that conch be landed in the shell. This requirement allows for undersized conch to be returned to the water unharmed and facilitates enforcement. The shells most likely be deposited on shore. Problems associated with bringing the shells to shore include the accumulation and abandonment of these if not used for other purposes. At present, fishers leave the shells behind either aggregated or scattered over the fishing area. There is no information available about the effect these empty shells have on the behavior of the conch, i.e., whether conch return to these burial grounds or not, behavior of other species, or on the habitat where they are left.

Socio-economic Effects

In Puerto Rico, about 150 full time fishers harvest conch commercially, and about 20 in St. Croix. There is an additional number of commercial fishers who harvest conch

seasonally, as part of multiple gear/multiple species trips, or on a part time basis. Those commercial fishers who harvest only or mostly conch might be impacted negatively in the short term, but the long term benefits outweigh the short term loss of income that size limits might impose. Commercial fishers might not be harvesting a significant number of juveniles at present since they are fishing at depths of over 90 feet. Juveniles do settle in deeper water, but it is not known what percent of the deeper water populations are juveniles.

In addition to the value of the commercial fisheries that are dependent on conch for subsistence, tourists visiting Puerto Rico and the U.S. Virgin Islands expect to see abundant marine life (including queen conch) and enjoy queen conch as part of their epicurean experience.

The management measure imposing size limits for queen conch require that conch be landed still attached to the shell, i.e., alive. This requirement facilitates enforcement hence reducing the costs, and also makes it possible for the undersized conch to be returned to the water alive thus, remaining in the fishery. Allowing conch to grow will when recaptured result in a higher meat yield as well as allowing juvenile conch to contribute to future generations.

This requirement might make fishers less efficient, since they will not be able to land as many pounds of queen conch meat (average meat yield is 33% of total weight). However, this requirement is necessary because of the great variability inherent in the shell-to-meat ratio. This variability precludes the establishment of an effective minimum allowable landing-weight per animal. If the meat is taken under water, there is no protection of juveniles since they would have been killed already (they must be sacrificed to obtain the meat).

(B) Harvest Limits

Biological Effects

Unregulated harvest of a resource results in overfishing. This is the case of the queen conch, but also of other marine species, such as the Nassau grouper, in the U.S. Caribbean. One way of regulating harvest is to limit the amount taken, that is all users are allocated a certain portion of the resource.

In Puerto Rico, commercial fishers are landing approximately 60 pounds of conch meat per single trip (1993) which amounts to about 180 pounds of conch (shell + meat). This average has decreased since 1988 when fishers were landing about 260 lbs of conch (shell + meat) per single trip. The experience from the U.S.V.I. shows that most commercial fishers are not landing more than the conch allowed. However, the size of the

conch been landed is under the minimum size established. The management measure would allow enforcement at-sea.

The majority of the trips in both Puerto Rico and the U.S. Virgin Islands report most catches below the proposed trip limit. It is possible that there might be an increase in the effort and thus biological gains may be negated.

There is no information available on the recreational harvest of queen conch. Information is needed on the effect of recreational fishing on juvenile queen conch since most recreational boating activities take place in shallower-nearshore areas. These activities might be more directly affecting the condition of the habitat and thus impacting the resource.

Socio-economic Effects

The impact of this management measure is on those fishers harvesting above the proposed bag limit. The proposed measure would impact approximately 7% and 3% of the trips in Puerto Rico and the U.S.V.I. respectively. Those commercial fishers harvesting above the average might experience a decrease in income unless they increase the effort by recruiting additional helpers. However, the fishery might not be sustainable for much longer if management is not incorporated in their harvesting operations. A possible positive impact might be the increase in price per pound of conch if the demand is high but the regulations prevent fishers from meeting the demand. On the other hand the effects can be negative if a black market is created or if there is no enforcement and greater amounts of conch are landed than those limits established. Less restrictive limits are beneficial to the commercial fisher on the short term but detrimental in the long run. The resource can be overfished to the point of collapse. A collapsed fishery is expensive to rebuild and most likely might take a long time to rebound to acceptable levels.

The impact of the more restrictive limit for the commercial fishers (75 conch per licensed commercial fisher per day) would affect 30% and 28% of the trips in Puerto Rico and the U.S.V.I. respectively. This will result in higher immediate loss in net economic benefits than the preferred option.

(C) Seasonal Closure

Biological Effects

Protection of spawning stock does not ensure successful recruitment. The seasonal closure in conjunction with the size limit ensure, from a biological stand point (under non changing conditions of critical habitat, food source and physical environment) the

availability of larvae and juveniles for recruitment. Critical habitat for settlement needs to be preserved. The conch are more vulnerable to harvesting during the reproductive season; because they migrate to shallower waters and they aggregate. Area closures have not been shown to be superior to seasonal closure since queen conch move over large areas. Although queen conch are reported to spawn throughout the year, it has been shown that peak spawning activity occurs between July and September. Also, commercial landings have been shown to be higher during this time (July-August). Elimination of fishing pressure, assuming low natural mortality, during a critical period of the life history offers protection to the species and results in a sustainable fishery.

Socio-economic Effects

Protecting the spawning stock provides some insurance against recruitment failure. Commercial fishers could experience a decrease in income (those commercial fishers only harvesting conch) unless they switch to fishing for other species. In the long term the likely repopulation of shallower areas for fishing might result in an increased and sustainable income. The majority of the commercial fishers are already involved in multiple fisheries.

The short-term economic loss that commercial fishers might face due to the closure are outweighed by the economic benefits accrued in the long run from the gradual increase in the number of conch which will be available to the fishery in the future.

(D) Gear Restrictions

Biological Effects

Queen conch are no longer found in large numbers in very shallow waters. Commercial fishing has moved progressively to deeper waters. It might take over 10 years for conch populations to be found in shallower areas where skin diving is possible. Protection afforded to the majority of the adult populations by banning HOOKAH (less conch can be caught per unit time skin diving than while diving with HOOKAH) might result in the rebuilding of the shallower water populations. This restriction safeguards both the resource and the users.

Socio-economic Effects

All commercial fishers will be severely impacted by a total ban on the use of SCUBA. In federal waters the ban on using HOOKAH gear might protect 'virgin spawning stocks.' Commercial fishers will have to rely on skin diving and SCUBA to harvest conch. Diving at the depths found in the federal waters with SCUBA gear and doing repetitive dives as

most fishers do (without following dive tables for decompression) could result in a significant number of accidents. These diving accidents can result in death, paralysis or poor health conditions which is equivalent to no income from conch fishing. This ban might be beneficial in decreasing the number of diving accidents.

(E) Effects on Marine Mammals and Endangered Species

Federally listed species of relevance to the Queen Conch FMP are: (1) Leatherback turtle (*Dermochelys coriacea*), (2) Hawksbill turtle (*Eretmochelys imbricata*), (3) Green turtle (*Chelonia mydas*), (4) Loggerhead turtle (*Caretta caretta*), and (5) the West Indian manatee (*Trichechus manatus*). No marine mammals or threatened or endangered species are expected to be either directly or indirectly affected by the FMP. The FMP encourages the protection and conservation of the critical habitats used by juvenile and adult queen conch (e.g., seagrass beds) which are also habitats shared by many other species among which are the above listed species.

(F) MITIGATING MEASURES

The FMP's gear restrictions are designed to mitigate potential effects on the resource.

(G) UNAVOIDABLE ADVERSE IMPACTS

A number of commercial fishers are dependent on conch for their income. The management measures could have a short term detrimental effect on the fishers' income but it will be outweighed by the beneficial long term increase in yield.

(H) IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

There are no expected irreversible or irretrievable commitments of resources.

5.0 LIST OF PREPARERS

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6.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

U.S. Department of Commerce, National Oceanic and Atmospheric Administration
Office of Ecology
U.S. Department of State
U.S. Department of Agriculture
U.S. Department of the Interior
U.S. Fish and Wildlife Service
National Park Service
U.S. Department of Transportation
U.S. Coast Guard
U.S. Environmental Protection Agency, Region II
Commonwealth of Puerto Rico
Government of the U.S. Virgin Islands

7.0 RESPONSE TO PUBLIC COMMENTS

This section summarizes testimony on an earlier draft of the FMP/RIR/EIS presented at 7 public hearings or submitted in writing to the Caribbean Fishery Management Council and/or the National Marine Fisheries Service during the public comment period. Included, herein, are the written depositions and letters received, as well as Council's responses to comments on this FMP. (NOTE: THERE WERE 33 ORAL TESTIMONIES (68 VOICED OPINIONS DURING THE COMMENT PERIOD) ADDRESSING THE MANAGEMENT MEASURES. THE MAJORITY OF THE DEONENTS AND COMMENTS RECEIVED WERE IN FAVOR OF MANAGEMENT BUT, MOST PROPOSED CHANGES TO THE MEASURES PRESENTED IN THE DRAFT FMP. MANY OF THE COMMENTS RECEIVED OPPOSED THE SIZE LIMITS, THE REQUIREMENT THAT CONCH BE LANDED IN THE SHELL, THE BAG LIMITS AND THE BANNING OF SCUBA. THE COUNCIL REVIEWED THESE COMMENTS AND REVISED THE MANAGEMENT MEASURES ACCORDINGLY. THE CHANGES HAVE BEEN INCORPORATED IN THE FMP. Editorial changes suggested and submitted by Agencies' officials (available at Council's office) have been incorporated already in the FMP.

Public hearings were held on the following dates and locations:

1. Culebra (7/5) February 15, 1995

2.	Vieques	(38/3+32)	February 16, 1995
3.	Cabo Rojo	(48/12)	February 21, 1995
4.	Fajardo	(18/4)	February 22, 1995
5.	St. Croix	(18/8)	February 27, 1995
6.	St. Thomas	(6/3)	February 28, 1995
7.	St. John	(1/0)	March 1, 1995

Numbers in parenthesis indicate the number of persons present at the hearings, the numbers following the slash indicate those people who spoke at the hearings. In addition, three (3) written comments were received at the Council's office and are included herein. NOTE: In Vieques, the commercial fishers present agreed that Don Toñín Medina and Mr. Carlos Ventura represented the fishing community and their concerns regarding the management measures. They thus, represented the opinion of 32 commercial fishers present at the hearings.

The comments are arranged by management measure as they appeared in the DFMP (dated January 13, 1995) and by area (e.g., Fajardo, St. Croix, etc.).

MANAGEMENT MEASURE 1

Culebra

1. Comment: In favor of landing conch in the shell because of the following reasons: a) Conch shells left on the bottom contribute to pollute the area and prevent conch from aggregating in the area where the shells are left behind; b) The practice of leaving the shell behind has created a burial ground of empty shells; areas to which conch will not return.

RESPONSE: Although there are no studies regarding the effect of leaving conch shells on the bottom, most fishers agree that conch do not return to the area. However, the Council's motive for requiring that conch be landed in the shell was to enhance enforcement efforts. There is no other way of ensuring that the size limit requirement is met.

Vieques

2. Comment: To bring the conch in the shell is very dangerous for the commercial fisher. There is too much weight involved since each fishing trip includes 2 or 3 fishers, 12 SCUBA tanks, 3 gas tanks and all the conch shells plus the weight of the "yola."

RESPONSE: The Council considered this issue the responsibility of the fisher(s) in the decision-making process to determine how much conch will be carried in the boat. Since this is the only sure way of enforcing the size limit, it is the responsibility of the person in charge of the boat as to how many conchs the boat can carry.

3. Comment: Where are the fishers going to deposit the shells? The shells should remain in the bottom to be used as a natural reef.

RESPONSE: The queen conch shells have value and are usable; these have been used in the curio trade, sold to tourists, used in construction, etc. The purpose of landing the conch in the shell is to prevent unnecessary mortality of illegal conch and enhance enforcement efforts.

4. Comment: In order to measure conch there should be a measuring tool made available to the fishers.

RESPONSE: The local governments are providing a measuring tool to queen conch fishers, so they can precisely determine the size of the conch before it is landed.

5. Comment: Bringing the shell to the boat is also a safety hazard since the additional force needed by divers, at the depths that fishing is done (110-120 ft), to bring up the shells, causes bubbles to accumulate in the body (bends).

RESPONSE: The Council considers this comment as irrelevant to the management measure. Diving represents a potential problem of safety for the fisher when diving tables and other SCUBA diving safety precautions are not taken.

6. Comment: Agrees with size limit but using the meat-size ratio instead of landing the shell. There is a scientific method to determine the average mass of the legal size conch and this average should be used instead of requiring that the fishers land the conch whole.

RESPONSE: The average weight of adult conch is highly variable. One can find very old conch with very little meat (as if it were a juvenile). Scientifically, the best relationship between size and sexual maturity (the management measure is designed to allow conch to reproduce at least once) has been found between lip thickness and sexual maturity. The lip of the conch shell thickens when they reach sexual maturity.

Fajardo

7. Comment: The sizes are too large. Where were the size data obtained from? It is better to use meat weight to size of conch ratio. It is a navigation safety hazard to land the conch in the shell. Sudden weather changes can sink the fishing vessel (average size 18 ft). The conch shell will create problems if deposited on the shore. It is more productive to leave the shell at sea.

RESPONSE: The management measure as revised proposes a shell length of nine inches or a lip thickness of 3/8 inch at least in one portion of the lip based on size data from published scientific papers. These requirements allow the conch to reproduce at least once. Scientifically, the best relationship between size and sexual maturity (the management measure is designed to allow conch to reproduce at least once) has been found between lip thickness and sexual maturity, not with the shell-meat ratio. The lip of the conch shell thickens when they reach sexual maturity.

Again, the boat operator is responsible for safety in the fishing operation. Already in St. Croix, U.S.V.I., there is a requirement to bring the shell with the animal intact and attached to the shell and still fishers are able to land the conch without problems regarding safety of boat operation.

See #1 and #3 above.

8. Comment: The total weight on the boat will include: 4 fishers, an air compressor, the tanks and the rest of the equipment, gasoline and the shells. The costs include the gas and food which amount to over \$40.00. The limit imposed of 75 conch (Management Measure 3) yields 25 pounds of meat which gives us about \$40.00. Increasing the limit, like in St. Croix, to 150 is what needs to be done. We know that once this Plan is approved it will be adopted and applicable to the P.R. state waters. Where are the sizes from? It is better to close the platform around P.R. on one side for some time and then open that side and close the other. There is no evidence that the conch is overfished. There are no clear statistics, they are not compulsory, specially not of conch.

RESPONSE: The Council considered this issue of safety the responsibility of the fisher(s) in the decision-making process to determine how much conch will be carried in the boat. (See #2 and #7 above.) The Plan presents information on the localized overfished areas and the declining trends of the landings statistics which constitute the best available data. There is scientific evidence presented in the Plan for the size limits proposed in Management Measure 1; specifically, this requirement allows conch to reproduce at least once. (See #7 above.) Management Measure 3 allows now, after reconsideration by the Council, for the commercial take of 150 conch per licensed commercial fisher per day, but all of which will have to be landed in the shell. The Council concurs with the economic burden that the limit of 75 conchs can cause at this time. Therefore, it was adopted that licensed commercial fishers may land one hundred and fifty (150) queen conch per day for the first year. However, the commercial fishers' quota might be lowered to one hundred (100) queen conch for the second year and to seventy-five (75) the third year. The quota

reduction is subject to review upon receipt of empirical information on which to base the decisions for new limits. Nevertheless, all conch harvested must still conform to minimum size specifications and be landed still attached to the shell. The Council makes recommendations to the local governments (Section 7.0(A) of the FMP) for the establishment of mandatory permitting and reporting.

Cabo Rojo

9. Comment: There are few 9" conch, the average is 7 1/2"; conch are mature at much less than 3/8" lip thickness. At least 50% of the harvestable conch would be lost with this measure.

RESPONSE: Scientifically, the best relationship between size and sexual maturity (the management measure is designed to allow conch to reproduce at least once) has been found between lip thickness and sexual maturity. In general, queen conch stop growing in shell length and the lip of the conch shell thickens when they reach sexual maturity. Although certain per cent of the queen conch mature at less than 3/8 inch lip thickness, and smaller than 9" shell length, scientific evidence shows that the highest percentage of mature conch will occur at 9" or larger conch or with a lip thickness of 3/8" or thicker.

10. Comment: If conch is landed in the shell it represents a safety problem due to the additional weight of the conch shells. Who's responsibility is it if there is an accident? There are small conch that are adults.

RESPONSE: See #2, #7, and #8 above.

11. Comment: Buyers and restaurant owners buy under sized fish, so fishers are not the only culprit.

RESPONSE: The Council understands this is a problem. Therefore, the regulations will include possession of undersize conch as a prohibition. This should address buyers, restaurant owners, etc.

12. Comment: The shell should be left on the bottom, the hermit crab, juvenile fish, octopus, etc., use the shell for shelter.

RESPONSE: The Council does not have any information as to whether the possible lack of empty conch shells at sea can cause the populations of hermit crab or other species to dwindle to dangerous levels.

13. Comment: It is a safety hazard bringing 375 pounds of ballast in the form of queen conch shells.

RESPONSE: See #2, #7, #8, and #10 above.

St. Croix

14. Comment: There is good rationale for bringing the shell to shore, that is for enforcement purposes. But, with the regulations in place in St. Croix we know that the enforcement is not there. The shells on the shore are a nuisance and are small. The option is to do it by weight; 2 uncleaned, 3 cleaned conch to the pound. There is a safety problem, the boats are small and landing the conch in the shell is not very safe.

RESPONSE: See #6 and #7 above. See #2, #5, #10, and #13 above.

15. Comment: The boat size and condition, the weather, the distance from shore are contributing factors to making it dangerous. The average conch weighs 7 lbs with shell * 75 conch is 525 pounds, each tank weighs 40 lbs * 10 tanks is 400 lbs; 1 driver and three divers on board (4 people * 150 lbs is 600 lbs); the total weight on the boat is (if all 4 fishers have licenses) 3,100 lbs. There could be injury to people and the question is, who is legally responsible if the boat sinks? There could be also injury to people if shells are brought to shore. For example, who is legally responsible for injuries caused by broken shells to people walking on the beach?

RESPONSE: The Council does not have the legal determination, at this time, to address this matter. See #2, #7, #8, #10, #13, and #14 above.

16. Comment: Recently 4 fishers were lost bringing conch with shell from 12 miles offshore. It is too dangerous.

RESPONSE: The Council inquired about this case. It seems that the weight factor was not involved in this occasion. Therefore, there is no valid reason to eliminate this measure.

MANAGEMENT MEASURE 2

Culebra

17. Comment: Establish permits for the use of the conch shells for local art products. Use the money from the permits to buy conch seedlings from Turks and Caicos and to plant them in the area.

RESPONSE: The Council considers that the authority to issue permits for the use of queen conch shells for local art products rests at the local agencies in charge of marine resources management.

Fajardo

18. Comment: It is good that juveniles are protected, but the size limit should be established in terms of meat weight.

RESPONSE: See #6 above.

St Croix

19. Comment: Recreational fishers are the damaging factor; they take everything they see. Buck Island has juveniles, but it is also a primary site for recreational fishers.

RESPONSE: The Council is not aware of studies quantifying the recreational take or any samples taken from the recreational harvest. However, recreational fishers are also bound by the proposed measures regarding size limits, bag limits, closed season, and gear restriction. Hence, any harm they may cause in an unregulated fishery should not occur after the FMP is implemented.

MANAGEMENT MEASURE 3

Culebra

20. Comment: Establish a permit for commercial fishers of conch and also for the conch buyers who should also be regulated since it is illegal to buy small conch.

RESPONSE: The Council declined to establish specific permitting systems for this FMP in the Exclusive Economic Zone.

21. Comment: Although the limit for recreational fishers is reasonable, there will be many violating the law. There has to be a strong control of the number of conch landed.

RESPONSE: See #19 above.

Vieques

22. Comment: The bag limit is too small for the commercial fisher. It is not an economic viable option. Why Puerto Rico 75 and the U.S.V.I. 150?

RESPONSE: The Council has addressed the question of the bag limit for commercial conch fishers and has set the limit to 150 queen conch per licensed commercial fisher per day. This quota will be reduced to 100 for the second year, and 75 for the third year if data shows that the resource is still declining after the first and second year of FMP implementation. The quota reduction is subject to review upon receipt of empirical information on which to base the decisions for new limits. Nevertheless, all conch harvested must still conform to minimum size specifications and be landed still attached to the shell.

23. Comment: No commercial landings statistics have been collected in Vieques in a long time. This information is missing from the decision making process. There are many commercial fishers who do not submit fishery statistics.

RESPONSE: The long term landings data used showed the declining trend throughout the area of Council's responsibility, which also includes Vieques. The scientific data used for adopting the preferred measures are also valid for the Island of Vieques.

Fajardo

24. Comment: There is no comparison between Puerto Rico and the U.S.V.I. In the U.S.V.I. uncleaned conch meat sells for \$5.00 per pound. In P.R. one gets \$3.50 per pound of clean meat. There is a loss for the fisher since there is a loss in the weight of the meat once it is cleaned. In the U.S.V.I. there are 2 fishers per boat while in Puerto Rico there are 4 people involved. If we could get larger, bigger boats then we could bring the conch in the shell.

RESPONSE: The issue of facilitating bigger boats to fishers is beyond Council's responsibilities. The Council also considers that the difference in prices and way of fishing between Puerto Rico and the U.S.V.I. is not large enough to warrant a different set of management measures for each area at this time. The Council has revised the measure and has increased the bag limit to 150 conch per licensed commercial fisher per day. All conch harvested must still conform to minimum size specifications and be landed still attached to the shell.

25. Comment: The limit for commercial fishers is too low. If you consider 3 conch to the pound of meat, 75 conch yield 25 pounds. Now, 150 conch, like in the U.S.V.I., is more reasonable. Then the product will be greater than the cost of the fishing trip. We are not interested in juvenile or small conch, it is too hard to clean and the buyers do not want it.

RESPONSE: See #22 above.

26. Comment: Recreational fishers have no license, they steal the harvest.

RESPONSE: The Council recommends a permitting system for all fishers. The Council does not have quantifiable information on the recreational harvest at this time. See #19 above.

Cabo Rojo

27. Comment: The limit of 75 conch per fisher (without limit per boat) is doable but it would be dangerous to bring the conch in the shell to shore. The depth of fishing (more than 50 ft), the distance from shore (about 10 miles), the bad weather (90% of the time there are more than 3-4' waves), the added weight of the conch shells (total of 600 lbs) all contribute to a dangerous situation. If, because of the weight, there are losses, of life or vessels, who is legally responsible for these losses? Can we sue the Council?

RESPONSE: See #2, #7, #8, #10, #13, #14, #15, and #16 above.

28. Comment: The limit for commercial fishers is too low. There are expenses associated with every trip between \$25 and \$30 dollars.

RESPONSE: The Council concurs with the economic burden that the limit of 75 conchs can cause at this time. Therefore, it was adopted that licensed commercial fishers may land one hundred and fifty (150) queen conch per day for the first year. However, the commercial fishers' quota might be lowered to one hundred (100) queen conch for the second year and to seventy-five (75) the third year. The quota reduction is subject to review upon receipt of empirical information on which to base the decisions for new limits. Nevertheless, all conch harvested must still conform to minimum size specifications and be landed still attached to the shell. See #22 and #25 above.

29. Comment: The commercial fisher is not the only one creating a problem, recreational fishers are more destructive, specially over the weekends (harvesting juvenile conch, anchoring, using jet skies, etc.).

RESPONSE: See #19, #21, and #26 above.

30. Comment: Seventy five conch per fisher is enough if there are 3-4 fisher per boat, but it is unsafe to bring the shells back to shore in vessels that are on average 17-18 feet (the shell's edge is very sharp). There would be an increase in expenses, additional cost for gasoline due to the additional weight.

RESPONSE: The Council concurs with the economic burden that the limit of 75 conchs can cause at this time. Therefore, it was adopted that licensed commercial fishers may land one hundred and fifty (150) queen conch per day for the first year. However, the commercial fishers' quota might be lowered to one hundred (100) queen conch for the second year and to seventy-five (75) the third year. The quota reduction is subject to review upon receipt of empirical information on which to base the decisions for new limits.

Nevertheless, all conch harvested must still conform to minimum size specifications and be landed still attached to the shell.

Again, the boat operator is responsible for safety in the fishing operation. Already in St. Croix, U.S.V.I., there is a requirement to bring the shell with the animal intact and attached to the shell and still fishers are able to land the conch without problems regarding safety of boat operation. See #2, #7, #8, #10, #13, #14, #15, #16, #27, and #28 above.

31. Comment: Twenty years ago, it was only the commercial fishers in the fishery. The recreational fishers have displaced the commercial fishers by fishing in shallow water and also by selling their catch. The fishery is also being displaced by the slate-pencil urchin "erizo de clavo" (*Eucidaris tribuloides*) which shares the same habitat as queen conch. RESPONSE: See #19, #21, #26, and #29 above. The issue of the recreational fishers selling their queen conch catch has been left at the discretion of the local governments. The Council is not aware of any scientific studies that look at the changes in habitat or environmental conditions which promote increase in sea urchin populations in detriment to those of queen conch.

32. Comment: Recreational fishers are being allowed to exploit a resource on which commercial fishers depend for their livelihood. This resource should be allocated to the commercial fishers. Seventy five conch is too little for commercial fishers.

RESPONSE: See #19, #21, #26, #29, and #31 above. The issue of the recreational fishers selling their queen conch catch has been left at the discretion of the local governments. The Council has addressed the question of the bag limit for commercial conch fishers and has set the limit to 150 queen conch per licensed commercial fisher per day. (See #22 above.)

St. Thomas

33. Comment: To make a living, commercial fishers need the limit increased to 150 conch per fisher per day. Since there is a closed season and a size limit, 150 is reasonable. The combination of these measures should be enough to safeguard conch. There are differences in the price per pound obtained by fishers from P.R. and fishers from St. Croix. The range in price is from \$2.50/lb clean meat in P.R. to \$6.00/lb uncleaned in St. Croix.

RESPONSE: The Council concurs with the economic burden that the limit of 75 conchs can cause at this time. Therefore, it was adopted that licensed commercial fishers may land one hundred and fifty (150) queen conch per day for the first year. However, the commercial fishers' quota might be lowered to one hundred (100) queen conch for the second year and to seventy-five (75) the third year. The quota reduction is subject to review upon receipt of empirical information on which to base the decisions for new limits.

Nevertheless, all conch harvested must still conform to minimum size specifications and be landed still attached to the shell. (See #28 above.)

MANAGEMENT MEASURE 4

Culebra

34. Comment: Orientation and education are important in implementing the law.

RESPONSE: Section 4.4 of the FMP states that one of the purposes of the FMP is to educate the users of the resource and the general public. Also, orientation and education are included among the objectives of the FMP (Objective 3).

35. Comment: The community agrees to a complete closure of the fishery for 5 years after which it can be reopened with an established management measure such as the proposed management measure number 4. Conch are most abundant during the months of September through January.

RESPONSE: The Council has determined that a total closure for five years is not needed to manage this fishery at present. Regarding months of abundance, scientific data indicate that although spawning occurs throughout the year, peak spawning activity for queen conch occurs in the summer months.

Cabo Rojo

36. Comment: A closure would work, but it is the spring when there is more copulation and spawning. Economically speaking, the months of July through September are the most valuable to the fishers. These are the months of highest demand. Who will guarantee that we will have clients available if the fishery is closed during the critical months?

RESPONSE: Regarding months of abundance, scientific data indicate that although spawning occurs throughout the year, peak spawning activity for queen conch occurs in the summer months.

37. Comment: We are willing to cooperate with a closure, but it should be between November and February. The reproductive peak is at this time, not in summer. The fishery can close during the 4 months.

RESPONSE: See #36 above.

38. Comment: The months of the closure should be changed to include the peak reproductive months of February and March.

RESPONSE: See #36 and #37 above.

St. Croix

39. Comment: Close and open the fishery on a three months on, three months off basis.

RESPONSE: The Council has established a closed season for the queen conch which offers the best protection to the resource while allowing the commercial fishers to fish during most of the year.

St. Thomas

40. Comment: Close during the whole whelk season, April to September.

RESPONSE: The Council believes that at this time this would be too restrictive, specially since there are other management measures proposed.

41. Comment: A spatial closure would be a better way of protecting conch.

RESPONSE: The Council does not have any scientific evidence that this suggestion is viable due to the variabilities inherent in the species ecology.

42. Comment: A three-month closure is too long, at most, it should be 1-1/2 month.

RESPONSE: See #36, #37, #38, #39, and #40 above.

MANAGEMENT MEASURE 5

Vieques

43. Comment: The majority of the commercial fishers use SCUBA, this measure is not acceptable. Banning SCUBA would probably send fishers to the unemployment lines.

RESPONSE: The Council has revised the management measure and at present only bans HOOKAH gear from the EEZ. The economic impact of this management measure to the commercial fishers could have significance since a large per cent of the fishers use SCUBA gear.

Fajardo

44. Comment: SCUBA is the equipment we use; therefore, we are opposed to this measure.

RESPONSE: See #43 above.

Cabo Rojo

45. Comment: SCUBA diving is a tool for doing work. About 50-60% of the fishing for conch is done in waters deeper than 50 ft (according to data from the P.R. Fisheries Research Laboratory, DNER). Many will be without a job if SCUBA is banned. SCUBA is safe for commercial diving.

RESPONSE: See #43 and #44 above.

46. Comment: There will be no more fishing if SCUBA is banned. If fishing is done in Mona Island one transits through federal waters, therefore, fishing for conch in Mona will not be possible. We have to prove that the harvesting was done in territorial waters if for example we were fishing in Mona since the catch would be transported through federal waters.

RESPONSE: The Council has revised the management measure and at present only bans HOOKAH gear from the EEZ. See #43, #44, and #45 above.

47. Comment: I have been fishing for 12 years, have harvested conch free diving and using SCUBA. There are too many divers and conch can not be found free diving since the fishing is in very deep water.

RESPONSE: See #43, #44, #45, and #46 above.

48. Comment: We (at the dive shop) fill 60 tanks per day for 20 fishers. There is a multiplying effect which affects fish, the fisher, restaurants, buyers, dive shops, tourism, etc. There is a need for balance between economics and conservation, between the needs of the fishers and the future of the resource. It is contradictory to prohibit SCUBA (Management Measure 5) when there are proposals, by the municipal government, to train unemployed people in diving and commercial fishing. There is an expense in acquiring a diving certification, in the payment of insurance but, then SCUBA will be prohibited.

RESPONSE: The Council has revised the management measure and at present only bans HOOKAH gear from the EEZ.

49. Comment: Banning SCUBA eliminates over 50% of the commercial fishers involved in the fishery since the depth of fishing is greater than 50-80 feet. It is risky to free dive at these depths. The income from fishing will decrease, the income to the dive shops from this activity will decrease.

RESPONSE: See #43, #44, #45, #46, and #47 above.

St. Croix

50. Comment: The banning of SCUBA only affects St. Croix and the U.S.V.I. because of the inter-island traffic. It should not be a violation to move among the islands. The economy is not good, the fishers save conch to be sold in St. Thomas. There should be a paper trail in place to identify the legal catch from St. Croix.

RESPONSE: The Council has revised the management measure and at present only bans HOOKAH gear from the EEZ.

51. Comment: Can not make a living if SCUBA is banned. No fishing can be done without tanks at 75-80 ft where fishing takes place now. There is abundance of conch in Lang Bank area and this measure would make it illegal to dive for conch there. It is also illegal to transport conch and SCUBA gear to St. John from St. Croix and also to transport it without the shell.

RESPONSE: The Council has revised the management measure and at present only bans HOOKAH gear from the EEZ. See #43, #44, #45, #46, #47, #49, and #50 above.

52. Comment: Dwindling resource not only due to "commercial overfishing". Because of the use of SCUBA by other user groups beginning in the 70's there is no conch in shallow water.

RESPONSE: The Council understands that other factors affect the condition of the queen conch resource, among these, the loss of habitat, specially for juveniles, near the coast. The FMP addresses these problems and makes recommendations to the local governments.

St. Thomas

53. Comment: Opposed to giving up SCUBA, it will eliminate a lot of jobs. Ban HOOKAH, but not SCUBA. It is the most effective and convenient way of harvesting, taking two hours instead of the whole day.

RESPONSE: The Council has revised the management measure and at present only bans HOOKAH gear from the EEZ.

OTHER COMMENTS:

54. Comment: Establish a limited entry system and cap the number of fishers in the queen conch fishery. Keep the limit of 75 conch per licensed commercial fisher per day.

RESPONSE: The Council has been considering limited entry as a management tool in other fisheries and the queen conch fishery. However, the Council has decided to establish a limit of 150 queen conch per licensed commercial fisher per day, and reduce

this limit to 75 if data shows a declining trend in spite of this management regime rather than establish a limited entry scheme at this time.

Culebra

55. Comment: Culture of conch and the planting of seedlings is needed.

RESPONSE: The Council recognizes the importance of continuing research on rearing conch in hatcheries; and on finding nursery grounds for conch. Therefore, the FMP makes recommendations to the local governments regarding the well being of the near shore habitats for healthy fisheries.

56. Comment: The fishery should be closed to all except for local fishers and local consumption. There are foreigners and people from other towns fishing around the Island.

RESPONSE: This issue could be addressed through the recommendations to the local governments in the FMP. However, the authority to prohibit non-locals to fish rests in the Puerto Rican Government.

57. Comment: There are other problems that contribute to the decrease in the number of conch among these are: pollution, overfishing, destruction of seagrass beds, tourism, sewage effluent (there is no sewage system in Culebra).

RESPONSE: The Council makes recommendations to the local governments to prevent anthropogenic activities from damaging near shore habitat.

58. Comment: The fishery should not be closed, but areas should be closed for reproduction and nursery.

RESPONSE: See #41 above.

Vieques

59. Comment: There are others who do much more damage to the reefs and the fishery such as the NAVY. The East coast is the most productive, but it is under siege. Practices by the NAVY must have an effect on the fishery and punishes the commercial fishers. If there are laws for us there must be laws for the NAVY. Habitat is extremely important. The newspapers and the communications media have presented the case of the destruction of mangrove and nursery areas. Since these are such drastic measures to save the conch populations and there are agencies that have been charged with the restoration of the species (US Fish and Wildlife, NMFS) and have funds to restore the populations why are they not doing it? They all want to simplify the problem by regulating the commercial fishers who are actually helping the economy, and above all the Vieques

economy. If the agencies in charge are not doing their job I don't know why we have to pay.

RESPONSE: The Council's position is the maintenance of a long term sustainable conch fishery. The best available data show a decrease in the landings of conch and the harvest of juvenile conch. The Fishery Management Plan has been written for the geographic range of the species, and it is expected that the federal and local governments assist in the conservation of this important fishery.

Cabo Rojo

60. Comment: There is no enforcement.

RESPONSE: The management measures are designed to enhance enforcement efforts (e.g., landing conch in the shell), and the Council encourages all agencies involved to have an effective enforcement of the FMP measures.

61. Comment: Pollution has destroyed nursery areas. During the summer, with increased tourism, there is oil everywhere and this kills the seagrasses.

RESPONSE: The Council has made recommendations on regulations and enforcement to the local governments regarding protection of habitat that should preclude oil spills from recreational boats and other sources to affect the queen conch habitat.

St. Croix

62. Comment: There are areas that have both juvenile and adult conch, but the water is too dirty (the areas of the Hess and Vialco Co.). These are on the West coast. Since they can not harvest in the West/South coast the fishers are forced to the East coast where the waters are cleaner. Other factors that contribute to the problem are building and construction which increase sediments in the water.

RESPONSE: See #61 above.

St. Thomas

63. Comment: Since there are missing data in terms of the life history of conch, the best alternative would be to have a refuge area. This is not proposed in the FMP.

RESPONSE: See #41 above.

64. Comment: There are other problems which include anchoring, pollutants, sewage discharge, marinas, among others in area of seagrasses and mangroves..., but

commercial fishers get regulated. Need to protect the areas close to shore, the spawning populations, re-stock the areas.

RESPONSE: See #57 and #61 above.

65. Comments: Economic consequences of management measures not documented.

RESPONSE: The FMP includes, as Appendix II, the RIR which evaluates the economic effect of the management measures. The best available data were used.

66. Comment: If we are given bigger boats, like those that are confiscated by the Coast Guard then we could bring the shells to shore.

RESPONSE: The issue of facilitating bigger boats to fishers is beyond Council's responsibilities.

**WRITTEN COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD
NUMBERS AND SYMBOLS SHOWN AT MARGINS CORRESPOND TO
COMMENT/RESPONSE NUMBER IN SECTION 7.0 OF EIS**