

3/30/95

**AMENDMENT 3**  
**TO THE**  
**FISHERY MANAGEMENT PLAN**  
**FOR**  
**CORAL AND CORAL REEFS**  
**OF THE GULF OF MEXICO**  
**INCLUDING AN ENVIRONMENTAL ASSESSMENT**  
**REGULATORY IMPACT REVIEW**  
**AND**  
**INITIAL REGULATORY FLEXIBILITY ANALYSIS**

**April 1995**

**Gulf of Mexico Fishery Management Council**  
**Lincoln Center**  
**5401 West Kennedy Boulevard**  
**Suite 331**  
**Tampa, Florida 33609-2486**

**SUMMARY:**

Amendment 3 with supplementary documents was prepared by the Gulf of Mexico Fishery Management Council to provide additional management to the harvest of live rock in the Gulf of Mexico. Live rock is an assemblage of living marine organisms attached to a hard substrate such as dead coral or limestone.

Amendment 2, implemented December 21, 1994, established area closures, vessel trip limits, gear restrictions, permits for harvest and aquaculture, restricted access, a phase-out of harvest by 1997, and a redefinition of octocorals.

This amendment considers further live rock regulation including an annual quota during phase-out, revision of trip limits, closed area off Florida's Panhandle, redefinition of allowable octocorals, and limited personal use harvest.

**TABLE OF CONTENTS**

I. INTRODUCTION ..... 3  
Description of the Fishery ..... 3

II. PURPOSE AND NEED ..... 5

III. ALTERNATIVES INCLUDING PROPOSED ACTIONS ..... 6  
A. Annual Quota ..... 6  
B. Trip Limits ..... 7  
C. Base for Allowable Octocorals ..... 8  
D. Live Rock Harvest off Florida's Panhandle ..... 9  
E. Personal Use Harvest of Live Rock ..... 10

IV. REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS ..... 11  
Impacts of Proposed Alternatives ..... 13  
Initial Regulatory Flexibility Analysis ..... 20

V. ENVIRONMENTAL CONSEQUENCES ..... 22

VI. TIME AND LOCATION OF PUBLIC HEARINGS ..... 28

VII. LIST OF PREPARERS ..... 29

VIII. LIST OF AGENCIES AND ORGANIZATIONS CONSULTED ..... 29

IX. OTHER APPLICABLE LAW ..... 30

X. REFERENCES ..... 30

XI. FIGURES ..... 31

## **I. INTRODUCTION**

### **Description of the Fishery**

With the recent development of technology to maintain marine aquaria, a market developed for calcareous material to decorate the tanks and to maintain the proper water chemistry. This material, composed mostly of calcium carbonate and the attached marine life occurs naturally off the South Atlantic and Gulf coasts and consists of coral reef rubble and limestone. Coral reefs, hard corals, and sea fans are protected by federal and Florida regulations. Taking or damaging them is prohibited.

Live rock was first marketed in the 1970s, but the fishery expanded greatly in the 1980s and early 1990s to meet the demand from the development of public and private marine aquaria.

Technical advances in saltwater aquarium filtration systems during the mid-1980s led to the feasibility of so-called "mini-reef" systems dominated by invertebrates. These organisms and nitrogen-fixing bacteria serve as a form of filtration to reduce toxins and filter out excess organics as they feed (Blackburn, 1988). Moe (1989) stated that placing 50 pounds of fully seeded, that is cleaned and completely stabilized, live rock in a marine system is the equivalent of transplanting a fully functional biological filter into a new system. Demand for ornamental fish began to include "live rock," consisting generally of calcareous substrates encrusted with a variety of living marine organisms.

Collectors, dealers, and hobbyists state that the presence of live rock is necessary to maintain a balanced marine aquarium. Aquarists often supplement rock in their tanks with pieces containing showy plants and animals (Jeffery Turner, pers. comm.).

Live rock is being produced in closed systems, but it is not a significant market factor at this time.

Live rock is now being air shipped throughout the United States and to Canada and England. The marine aquarium hobby at first concentrated on fishes because neither the equipment nor the knowledge allowed the keeping of other organisms. Gradually, as knowledge and equipment improved, more and more invertebrates were kept successfully. In recent years, the development of "Living Reef" aquarium systems that were able to maintain stable environments in closed-system aquaria has enabled aquarists to set up and maintain tiny bits of reef ecology in their homes (Feddern, pers. comm.). Florida live rock landings reported in 1993 reached 954,000 pounds. Landings from the Gulf of Mexico in 1994 are projected to be about 500,000 pounds.

Robert Stewart, Jr. (pers. comm.), reports that live rock "carries" the marine aquarium trade industry of Florida and estimates that without the sale of live rock, his company would lose 50-75 percent of its gross revenue, since the live rock is very important in stimulating the sales of related marine life products.

Most of the live rock collectors are in the marine life fishery, which also harvests tropicals for the aquarium trade. Live rock is harvested by divers who selectively remove small pieces from the bottom, either by picking up loose rubble rock or chipping rock from reef or ledges. FDEP records show about 140 collectors who are qualified to receive federal permits having reported landings prior to a control date of February 3, 1994. By the end of March in 1995, only 62 individuals

obtained the new federal permit. Of these, 22 reside in the Gulf area. Individuals with aquaculture permits have deposited over 3 million pounds of cultch material on their sites in state and federal waters. Harvesters maintain that they do not remove large quantities from a single site, but range over wide areas of hard bottoms choosing aesthetically pleasing pieces that would beautify aquaria. One square mile of hard bottom is estimated to contain about 600,000 to a million tons of live rock in the top one foot of surface comprising slightly over a million cubic yards (Feddern, Pers. Comm). The Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico estimates there to be 19,691 square miles of live bottom within 55 fathoms in the Gulf (GMFMC, 1981). This amounts to almost 20 billion tons in the top one foot of surface. While this is not all available to diver harvesters, it serves as hard bottom habitat.

## **Objectives**

The FMP identifies the following plan objectives and problems in the fishery:

### **Primary Management Objective**

Optimize the benefits generated from the coral resource while conserving the coral and reefs.

### **Specific Management Objectives**

1. Develop scientific information necessary to determine feasibility and advisability of harvest of coral.
2. Minimize, as appropriate, adverse human impacts on coral, coral reefs, live rock and live bottom habitat.
3. Provide, where appropriate, special management for coral habitat areas of particular concern (HAPCs).
4. Increase public awareness of the importance and sensitivity of coral and coral reefs.
5. Provide a coordinated management regime for the conservation of coral and coral reefs.

### **Problems in the Fishery**

1. Degradation of the stocks through natural and man-made impacts.
2. Limited scientific information on many species and many sections of the management unit, which includes the inability to assess the impact of coral harvest.
3. Susceptibility to stress because of corals being located at the northern limit of their distribution.
4. Inability of corals to escape stress because of their sedentary nature.
5. Complexity and inconsistency of management regimes.

6.Lack of adequate public understanding of the importance of coral and coral reefs.

7.Present lack of jurisdiction over most coral and coral reefs by a federal agency which has traditionally executed authority and jurisdiction. (In 1979 in United States v. Alexander the Court ruled that the Bureau of Land Management's authority to protect coral reefs was restricted to activities connected to administration of mineral leases.)

## **II.PURPOSE AND NEED**

Amendment 2 to the Coral and Coral Reef FMP, effective December 1994, limited live rock harvest in the Gulf of Mexico to Florida's west coast, excluding Monroe County. Daily trip limits of up to 25 five-gallon buckets and prohibition of power tools were established. The chipping of rock is prohibited north and west of the Pasco-Hernando County line. Harvest is allowed under permit and, to be eligible, applicants must have produced and reported live rock landings prior to February 3, 1994. Harvest of wild live rock in the Gulf is to cease at the end of 1996 after which only permitted aquacultured rock may be landed. Similar regulations apply to the EEZ off Florida's Atlantic southeast coast, but wild harvest is limited to 485,000 pounds in 1995 after which wild harvest is terminated.

The Gulf Council considered, but rejected, several alternatives of placing an annual quota or diminishing annual quotas on live rock production from the Gulf EEZ. Rationale for rejection concluded that limited access to current harvesters, trip limits, and gear restrictions would limit harvest to near current levels of 1993 and 1994.

Subsequently, there has been a concern that there may be a relocation of effort to the Gulf from Florida's east coast as the 1995 quota is met and harvest ceases. A transfer to aquaculture in Florida's east coast has been delayed due to delays in completing procedures for obtaining permits in that area.

If an annual quota is adopted, it may be desirable to reduce daily trip limits in order to prevent a harvest derby early in the season. The average daily trip catches in 1993 and 1994 are less than 600 pounds.

In Amendment 2, the Council adopted a definition of allowable octocorals to include a limited portion of the substrate to which it is attached in order to prevent a bycatch of otherwise prohibited live rock. The allowable amount of substrate is that portion covered by and within three inches of the holdfast. The Florida Marine Fisheries Commission recently published regulations that allow only that portion of the substrate covered by and within one inch of the holdfast. The FMP provides that the more restrictive of state or federal regulations apply. In this regard the state regulations would apply to the EEZ as well as state waters.

The Council considered but rejected all procedures for personal use harvest of live rock in Amendment 2. Because of interest by personal use harvesters, this issue is being reconsidered for the Gulf EEZ.

In Amendment 2, the Council determined that indefinite and unregulated harvest of live rock would be detrimental to the hard bottom habitat for reef fishes and other species. Management was

provided to phase-out harvest by 1997. This amendment would prevent further expansion of the harvest during the phase-out period.

### **III. ALTERNATIVES INCLUDING PROPOSED ACTIONS**

#### **Summary of Alternatives**

A. Annual Quota and Revision of Optimum Yield

B. Trip Limits for Harvesting Wild Life Rock

C. Base for Allowable Octocorals

D. Live Rock Harvest off Florida's Panhandle and Extension of the Area where Chipping is Allowed

E. Personal Use Harvest of Live Rock

#### **A. Annual Quota**

**Alternative A.1: Status Quo - no change. All harvest of wild live rock where allowed in the Gulf EEZ during phase-out is restricted by permit requirement, trip limit, area closure, and gear restriction. There is no annual quota. Optimum yield is unlimited through 1996.**

Discussion: Florida Department of Environmental Protection (DEP) records indicate that 140 state permit holders reported live rock landings prior to the control date of February 3, 1994. Only 35 reported west coast landings in 1994. A trip limit of 25 five-gallon buckets equates to about 625 to 1,250 pounds (25 pounds to a maximum of 50 pounds per bucket). Some harvesters in closed areas could transfer effort to open areas in the Gulf in 1995 and 1996, causing more rapid removal of material than anticipated.

Rockers have requested they be allowed to maintain harvest through 1996 in order to maintain viable markets and cash flow during conversion to aquaculture.

**Preferred Alternative A.2: Establish an annual quota of 500,000 pounds of wild live rock from open areas in the Gulf EEZ in 1995 and 1996 after which harvest will end. This amount is to be optimum yield during the phase-out after which OY is to be zero.**

Discussion: The intent is to stabilize harvest without a substantial increase in the terminal years. The projected level of reported landings from open areas of the Gulf of Mexico in 1994 is selected as an appropriate level of harvest for the final two years. (See Table 1). The number of eligible harvesters is limited to about 147, those reporting landings prior to the control date of February 3, 1994.

Concern has been expressed that east coast harvesters will transfer effort to the west coast as quotas are filled in 1995 and harvest is terminated there by 1996. The south/east (Atlantic) quota of 485,000 pounds was projected to be filled, and harvest ended there for the year at the end of October 1994.

**TABLE 1  
FLORIDA LIVE ROCK LANDINGS 1991-1994  
BY AREA (SOURCE FDEP)**

WEST COAST				SOUTH/EAST COAST		
YEAR	POUNDS	\$ VALUE	TRIPS	POUNDS	\$ VALUE	TRIPS
1991	194,681	233,369	592	392,421	411,638	1,053
1992	251,810	239,401	770	547,974	363,493	1,544
1993	323,564	402,228	641	630,077	658,100	1,265
1994*	477,123	630,389		475,322	510,181	

\*Incomplete reporting in November and December

### **B.Trip Limits for Harvesting Wild Live Rock**

**Preferred Alternative B.1. No change - Permitted vessels are limited to 25 five-gallon buckets or an equivalent container volume (16.88 cubic feet) of wild live rock per daily trip in the Gulf of Mexico EEZ. This amounts to about 625 to 1,250 pounds per trip.**

Discussion: Current trip limits allow rockers to take advantage of favorable weather and good market conditions. A permit moratorium limits the number of harvesting vessels. Closure of Florida's east coast could result in translocation of effort and use of larger vessels in the open areas of the Gulf, however.

Average pounds per trip shown in Table 2 and calculated from Table 1 ranged from a low of 327 from the west coast in 1992 to a high of 561 in 1994.

**Alternative B.2. Limit permitted vessels to 10, 15, or 20 five-gallon buckets or an equivalent volume of wild live rock per daily trip in the Gulf of Mexico EEZ.**

Discussion: Vessel trip limits may be useful under a limited annual quota to distribute the allowable harvest among users and prevent derby fishing. Testimony from live rock harvesters describe a maximum weight of a 5-gallon bucket to be about 50 pounds. West coast harvesters find the more porous rock to average about 27 pounds per bucket or about 675 pounds per 25 buckets. Florida's original live rock rule set a 500-pound trip limit.

TABLE 2		
AVERAGE POUNDS PER TRIP (FROM TABLE 1)		
YEAR	WEST COAST	SOUTH/EAST COAST
1991	329	373
1992	327	356
1993	505	498
1994 incomplete	561	487

**C. Base for Allowable Octocorals**

**Preferred Alternative C.1: Allowable octocorals means erect, non-encrusting species of the subclass Octocorallia, except the prohibited sea fans *Gorgonia flabellum* and *G. ventalina*, including only the substrate covered by and within one inch of the holdfast. This applies only to allowable octocorals in areas where live rock harvest is prohibited.**

Discussion:

Any restrictions on live rock harvests will affect harvest of octocorals allowed under the FMP since most octocorals taken for the marine aquarium trade are removed with some attached substrate. A redefinition of "allowable octocorals" clarifies that only individual colonies, and not whole rocks, may be taken under the octocoral quota. A small portion of the rock is allowed to provide a suitable anchor for the octocoral. Harvest of octocorals encrusting on a hard substrate (i.e., primarily *Briareum* and *Erythropodium* spp. or "gorgonian live rock") involves removal of the entire rock substrate and thus is defined as harvest of live rock rather than allowable octocorals. These same octocorals, if encrusted on other than rock substrate, i.e., algae, would be allowable. The intent of this definition is not to protect encrusting octocorals but to protect live rock where prohibited from harvest as allowable octocoral.

This management provision was originally considered for the Gulf EEZ, but the amount of substrate was increased to three inches on advice of the advisory panel, the one-inch limit being insufficient to anchor larger specimens. The Florida Marine Fisheries Commission has implemented the one inch of substrate to prevent a bycatch of live rock specimens of up to six inches in total breadth around a holdfast. This apparently is a problem in Monroe County (the Florida Keys). The one-inch rule also applies in the South Atlantic area.

The Coral FMP provides that in harvest of octocorals the more restrictive of state or federal regulation would apply. Thus, the Florida one-inch rule is the de facto rule for the EEZ off Florida as well. This alternative puts the federal rule in compliance with Florida's regulation and is consistent with that for the South Atlantic area.

**Alternative C.2: Status Quo. Allowable octocorals means erect, non-encrusting species of the subclass Octocorallia, except the prohibited sea fans Gorgonia flabellum and G. ventalina, including only the substrate covered by and within three inches of the holdfast.**

Discussion: This is the current provision implemented in Amendment 2. It provides for an allowance of three inches of substrate around the holdfast of an octocoral to provide sufficient anchoring of large octocorals in aquaria. This size was recommended by the advisory panel as being adequate. It is not intended to prohibit the taking of encrusting octocorals on materials other than prohibited live rock or corals. It is superseded by the more restrictive state regulation allowing only one inch around the holdfast.

#### **D. Live Rock Harvest off Florida's Panhandle**

**Alternative D.1: Status Quo. Live rock harvest is allowed in the EEZ along Florida's west coast except for Monroe County until 1997. Chipping of live rock for removal off larger structures is prohibited north of Pasco County, Florida.**

Discussion: Management measures in the Gulf EEZ are designed to allow existing harvest practices in areas where harvest has occurred and to phase it out by 1997. The number of participants is limited to those reporting landings prior to February 3, 1994. Daily trip limits have been provided to restrain and distribute harvest. A no-chipping regulation protects ledge structure off Florida's Panhandle (see Figure 1-A). One such reef system, "the 18s", (in 18 fathoms) located 10 to 11 miles off Destin runs for miles in an east-west direction in 100 to 110 feet of water (Bailey, 1993).

**Preferred Alternative D.2: Live rock harvest is permitted in the Gulf of Mexico EEZ only from Collier County through Levy County until 1997. Chipping of live rock is allowed in this area. Elsewhere in the Gulf EEZ live rock harvest or possession is prohibited (see Figure 1-B).**

Discussion: Harvesters of wild live rock in Southwest Florida from Collier through Levy Counties have been provided with a three year period (until 1997) to convert to aquaculture of live rock on leased sites in Florida waters or in federal waters under authorization by permit. Live rock is abundant in this area.

In the area of the EEZ north and west of Levy County, Florida, live rock is not as abundant and occurs only in outcroppings which are valued as habitat for reef fish and favored by fishermen (Figure 2). Divers also utilize these ledges for recreational diving. In March of 1994, the Gulf Council after hearing testimony that removal of live rock was causing severe damage to the popular fishing and diving spots off the Florida Panhandle, requested emergency closure of live rock harvest in that area. There are only a few commercial harvesters of live rock in this area; however, the resource is not as abundant as off the Southwest coast. Therefore, the possible impact of harvest is of greater concern to local citizenry.

In July 1994, the Council, after reviewing bottom charts and videos of the Gulf off Okaloosa County in the Panhandle revised its draft Amendment 2 to allow limited harvest but to allow no

chipping there in order to protect the structure of rock ledges off the Florida Panhandle. Loose material may be collected. Landings of live rock in the Panhandle have been reported only off Okaloosa, Walton and Wakulla Counties from 1992 through 1994. Landings in these three counties have amounted to less than 45,000 pounds per year (see Table 3). The majority of Gulf landings is reported from the five contiguous counties on Florida's west central coast, Manatee through Hernando. However, some landings have been reported from Levy County only in 1994, and no landings reported from Sarasota County since 1992 (Figure 1).

This action would allow chipping for removal of pieces of live rock in the area off Florida's west coast from Collier through Levy Counties where live rock is abundant. Three additional counties (Hernando, Citrus, and Levy) are being added by this action because of extensive availability of hard bottom and to simplify enforcement.

<b>TABLE 3</b>			
<b>FLORIDA WEST COAST LIVE ROCK LANDINGS IN POUNDS</b>			
	<b>1992</b>	<b>1993</b>	<b>1994*</b>
WEST CENTRAL (Collier-Levy)	246,776	278,983	355,311
PANHANDLE (Dixie-Escambia)	8,503	44,185	40,663

\*Incomplete after August

**E. Personal Use Harvest of Live Rock**

**Preferred Alternative E.1: Status Quo. Prohibit the harvest of wild live rock for personal use. No take of live rock is allowed without a permit.**

Discussion: This alternative addressed the Gulf Council's consideration of recreational harvest. Aquarists requested a recreational allowance to provide live rock for their personal aquaria, and the Councils previously included this issue for public comment. The proposal for limited private use collection was rejected in Amendment 2 after careful review. This is consistent with Florida's proposed phase-out of landings which allowed landings from the EEZ only by Florida commercial permit holders. Harvest would be from the EEZ; thus it would not be a simple matter of collection by snorklers or persons wading from shore. Enforcement to separate recreational users and commercial harvesters would be difficult without an elaborate permit system. Recreational harvesters are unlikely to know boundaries of aquaculture operations and could unintentionally poach in such areas. Inexperienced live rock collectors may also take a bycatch of prohibited corals, not easily identified on the rock.

The Council recognizes that removal of live rock can be detrimental to the fishery habitat but is allowing a phase-out to allow harvesters to convert to aquaculture. This is not a comparable situation with recreational harvesters who are not economically tied to the activity. This alternative is consistent with Florida regulations.

**Alternative E.2: A personal use harvest and possession of up to a two gallon (0.27 cubic foot) (or more) bucket container of live rock is allowed per person per day during the terminal harvest period in the EEZ. No wild harvest permit is required. Sale of such material is prohibited.**

Discussion: A personal use take of wild live rock would be allowed **only during the phase-out terminal periods and would end thereafter**. Termination would shorten the period of enforcement difficulty for Florida where taking and possession is prohibited in state waters. It would also prevent poaching from aquaculture sites after closure in 1997. An allowable take of a five-gallon bucket per person per day has been suggested by the American Aquarist Society. This alternative was considered and rejected in Amendment 2.

**Alternative E.3: A personal use harvest and possession of up to a two-gallon (0.27 cubic foot) (or more) bucket container of live rock is allowed per person per day in the EEZ. Sale of such material is prohibited. No wild harvest permit is required.**

Discussion: This alternative allows an individual to take live rock **indefinitely** from the EEZ for personal use in his aquaria. This is not allowed in Florida waters and could pose an enforcement problem for that state. Aquarists have requested some allocation for their use and have suggested a 5-gallon bucket container as a daily limit. Personal use harvest without a permit after 1997 would pose an enforcement problem in the EEZ. Poaching from aquaculture sites could be a problem. Under the status quo only those persons with an aquaculture permit could possess live rock after 1997. This alternative was rejected in Amendment 2.

**Alternative E.4: A personal use harvest and possession of up to a two-gallon bucket container of live rock is allowed per vessel per day in the EEZ of the Gulf of Mexico (a. through 1996 or b. indefinitely). Sale is prohibited.**

Discussion: This alternative excludes multiple possession limits aboard a vessel containing numerous persons. This alternative has not yet specified the duration of the allowable, personal use harvest.

**Alternative E.5: A personal use permit is required to take live rock in limited quantities specified for one's personal use.**

Discussion: This alternative has been suggested by representatives of aquarium hobbyists to provide some identification of those persons legally possessing live rock in limited quantity. The Florida Marine Aquarium Society in Miami has 450 members. It is not known how many would be interested in collecting live rock from the Gulf EEZ for personal use. This alternative could be used in conjunction with Alternatives E.2 or E.3. It was rejected in Amendment 2.

#### **IV. REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS**

## **Introduction**

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

The RIR also serves as the basis for determining whether any proposed regulations are a "significant regulatory action" under certain criteria provided in Executive Order 12866 and whether the proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act of 1980 (RFA).

This RIR analyzes the probable impacts on fishery participants of the proposed plan amendment to the Fishery Management Plan for Coral and Coral Reefs of the Gulf of Mexico (FMP).

## **Problems and Objectives**

The general problems and objectives are found in the FMP, as amended, and in Section 1.0 of this plan amendment. The purpose and need for the present plan amendment are also found in Section 1.0. The current plan amendment addresses the following issues: 1) annual quota, 2) trip limits for harvesting wild live rock, 3) base for allowable octocorals, 4) wild live rock harvest off Florida's panhandle, and 5) personal use harvest of wild live rock. The various measures proposed to address these issues are designed to mitigate the short run dynamic disequilibrium impacts caused by the phase-out period, adopted in Amendment 2, that would eventually ban the harvest of wild live rock

## **Methodology and Framework for Analysis**

The basic approach adopted in this RIR is an assessment of management measures from the standpoint of determining the resulting changes in costs and benefits to society. The net effects are stated in terms of producer surplus to the harvest sector, net profits to the intermediate sector, and consumer surplus to the final users of the resource.

The harvest sector refers to the commercial harvesters of live rock and the intermediate sector, to dealers of live rock. Final users of the resource are taken to refer to the individuals that derive benefits from the resource in either consumptive or non-consumptive manner. These final users consist of individual buyers of live rock from commercial dealers or harvesters, harvesters of live rock for use in personal aquaria, extractors of live rock for research purposes, and non-extracting users of live rock such as divers.

In addition to changes in the surpluses mentioned above, there are also changes in producer and consumer surpluses of indirect users of the resource, such as those involved in other fisheries and tourist activities, that will be effected through a change in the management of live rock. Moreover, other so-called non-use values, such as existence value, bequest value and option value, will be affected by a change in the management of live rock. Finally, there are public and private costs associated with the process of changing and enforcing regulations on live rock.

Ideally, all these changes in costs and benefits need to be accounted for in assessing the net economic benefit from management of live rock. The RIR attempts to determine these changes to the extent possible, albeit in a very qualitative manner.

## **Impacts of Proposed Alternatives**

### **A. Annual Quota**

**Alternative A.1: Status Quo - no change. All harvest of wild live rock where allowed in the Gulf EEZ during phase-out is restricted by permit requirement, trip limit, area closure, and gear restriction. There is no annual quota. Optimum yield is unlimited through 1996.**

**Preferred Alternative A.2: Establish an annual quota of 500,000 pounds of wild live rock from open areas in the Gulf EEZ in 1995 and 1996 after which harvest will end. This amount is to be optimum yield during the phase-out after which OY is to be zero.**

Wild live rocks are harvested mostly in the EEZ off Florida. Florida has already banned harvest of wild live rock in state waters. The Coral FMP, as amended, bans the harvest of wild live rock in the South Atlantic EEZ north of Dade County, Florida and in the Gulf EEZ north of the Florida-Alabama state line and south of Monroe County, Florida. In addition, harvest of wild live rock in the open areas in the South Atlantic (south of the Broward-Dade County line) will cease in 1996 while harvest in the open areas in the Gulf (south of the Alabama-Florida state line and north of the Collier-Monroe, Florida, county line) will cease in 1997. During the open years, harvest in the South Atlantic is restricted to a quota of 485,000 pounds while that in the Gulf is restricted mainly by trip limit and gear restriction with no quota.

The underlying demand for live rock is relatively strong. Global retail sales in the ornamental fish hobby has been estimated at about \$4 billion, and about \$1.6 billion of that amount are spent in the U.S. (Derr, 1992; Andrews, 1990). Reportedly, the fastest growing component of the marine life or aquarium trade is minireefs or live reef aquarium systems, the cost of which could range from a thousand to several tens of thousands of dollars (Derr, 1992). A vital component of this type of aquarium is live rock and its associated invertebrates. Consumer demand then for such type of aquaria underlie the derived demand<sup>1</sup> for live rock. In 1994,

---

<sup>1</sup>The demand that harvesters of live rock face is termed "derived demand" to stress the fact that live rock is one of the inputs of

domestic producers harvested live rocks valued at about \$1.14 million, which is slightly above the 1993 value of \$1.06 million.

Empirical estimates of such demand are not currently available, and in fact there is little known about the demand for live rock. But it is perhaps safe to conclude that such demand is increasing. This is partly borne by the increasing volume and value of live rock harvest, a change in quantity supplied reflecting changes in demand. Table 1 summarizes live rock landings and values for the west and south/east coasts of Florida. The 1994 landings in the south/east were constrained by the quota. Average ex-vessel price in the south/east remained relatively the same from 1993 to 1994 but slightly increased in the west coast. This average price is, of course, not very instructive because of the large differential in prices various types of live rocks command. For example, bare rubble rock can be sold for \$0.50 a pound while "Christmas tree rock" can get as much as \$3.00 a pound. Nonetheless, the increase in average price may be deemed to reflect an increase in demand.

Under Alternative A.1 (status quo), landings and values in the Gulf area may be expected to increase further under the assumption that demand for the product is increasing. Alternative A.2 (preferred alternative), on the other hand, would constrain harvest to about the 1994 level. The associated dollar values may also increase under the assumption of an increasing demand, but such increase in dollar values may be expected to be less than that under the first alternative. Most likely the additional cost of harvesting live rock under the status quo would not be substantial since the same harvesting technology would be used. In this event, the increase in producer surplus would be higher under status quo than under the preferred alternative. But this condition assumes that effort in the fishery would not substantially increase.

In principle, the preferred alternative would not result in losses in producer surplus to the harvest sector since the proposed quota is set at about the 1994 harvest level in the Gulf. This alternative simply means that some producer surplus would be forgone by the industry. This is a more likely situation for the 1995 season, the first year the proposed quota would be in place. But the 1996 season would be different. By then the South Atlantic would be totally closed to any commercial harvest of wild live rock. If displaced harvesters move to the Gulf, producer surplus may be expected to decline as will be discussed shortly.

It was noted in Amendment 2 to the Coral FMP that there were about 147 harvesters of wild live rock, and many participated in the fishery on a part-time basis. Currently there are 62 permitted vessels whose owners reported landings prior to the control date of February 3, 1994. Of the total vessel owners, 22 reside in the Gulf area. When the South Atlantic area closes to any commercial harvest of wild live rock in 1996, some harvesters are likely to move to the Gulf area. In this scenario, the fixed quota would be shared by a larger number of harvesters. While total revenue may not significantly change, given an increasing demand, the entrance of additional harvesters would increase the cost of the industry as a whole. In this way, producer surplus may be expected to decline under the preferred alternative.

producing aquaria products. Final consumers demand these aquaria products.

Both the profits of the intermediate sectors and consumer surplus would tend to increase under the status quo as more of the products become available in the market. A quota, as proposed under Alternative A.2, would restrict such benefits to the current level.

While benefits of the status quo accrue to the Gulf live rock industry and its associated industries, certain potential costs would be borne by other sectors and by society as a whole. These cost items are associated with forfeiting benefits from non-harvest of live rock. These benefits are in turn associated with the value of live rock either by itself or as contributing factor to the survival of other marine organisms that may have commercial, recreational or other uses.

The status quo may be expected to sustain the benefits derivable from the harvest of live rock, but the attendant costs of an increasing harvest of live rock, although not quantifiable at the present time, appear to be less than negligible and are likely to substantially increase in 1996 when the South Atlantic area is closed to all commercial harvest of wild live rock.

## **B.Trip Limits for Harvesting Wild Live Rock**

**Preferred Alternative B.1: No change - Permitted vessels are limited to 25 five-gallon buckets or an equivalent container volume (16.88 cubic feet) of wild live rock per daily trip in the Gulf of Mexico EEZ. This amounts to about 625 to 1,250 pounds per trip.**

**Alternative B.2: Limit permitted vessels to 10, 15, or 20 five-gallon buckets or an equivalent volume of wild live rock per daily trip in the Gulf of Mexico EEZ.**

Vessel trip limits are bound to penalize larger vessels in the fishery. But it has been reported that most operators use vessels with lengths ranging from 22 to 28 feet and harvest up to 18 to 20 five gallon buckets per trip. In this situation, the status quo is not a binding constraint on most harvesters so that this alternative would have no impact on costs and benefits in the fishery. Lower trip limits under Alternative B.2 would start to have adverse effects on some industry participants. Such adverse effects, however, would have to be seen within the context of potential season closure under a quota regime.

Like most fisheries, the wild live rock fishery may experience closures under quota management. Even if the proposed quota (Alternative A.1) is pegged at the current harvest level, we may still expect some form of derby in the fishery. While such derby effect may not appear in the 1995 season due to the restriction imposed on the number of permitted live rock harvesters, it may become strong in the 1996 season if displaced harvesters in the South Atlantic move to the Gulf area. We may recall that of the current 62 permitted vessels, 22 owners reside in the Gulf and these 22 have harvested in 1994 an amount equivalent to the proposed quota. Additional harvesters, especially if many, would thus tend to shorten the wild live rock harvest season in the Gulf. To the extent that prices drop during the open season, the industry as a whole would tend to experience lower producer surplus. In this event, lower trip limits under Alternative B.2 may forestall significant reductions in producer surplus.

It may be stressed, at any rate, that vessel trip limits only introduce further technical inefficiency into the fishery, but to the extent that a substantial increase in fishing capacity is prevented such technical inefficiency on certain segments of the industry may not have a significant effect on the efficiency of the entire industry, especially under a derby situation..

Considering that most of current wholesalers are relatively small operations, trip limits under either alternatives would not have any significant effects on them. In addition, consumers would not experience increases in prices apart from that brought about by increases in demand.

### **C. Base for Allowable Octocorals**

**Preferred Alternative C.1: Allowable octocorals means erect, non-encrusting species of the subclass Octocorallia, except the prohibited sea fans Gorgonia flabellum and G. ventalina, including only the substrate covered by and within one inch of the holdfast.**

**Alternative C.2: Status Quo. Allowable octocorals means erect, non-encrusting species of the subclass Octocorallia, except the prohibited sea fans Gorgonia flabellum and G. ventalina, including only the substrate covered by and within three inches of the holdfast.**

The only difference between these two alternatives is the size of the allowed substrate around the holdfast, namely, within one inch versus within three inches of the holdfast. The preferred alternative would make the Gulf rule consistent with that of the South Atlantic and of the rule in Florida. In effect, however, the Florida rule governs harvest in the Gulf EEZ because the coral FMP provides that the more restrictive state or federal rule would apply for octocorals.

While possibly editorial in nature, the preferred alternative may have an adverse effect on harvesters. This effect is unknown, but if such effect is evaluated, it should be set against the higher probability that other organisms not allowed to be harvested could be taken along with the harvest of wild live rock.

These alternatives appear to have no effects on both the intermediate sectors and final consumers.

### **D. Live Rock Harvest off Florida's Panhandle**

**Alternative D.1: Status Quo. Live rock harvest is allowed in the EEZ along Florida's west coast except for Monroe County until 1997. Chipping of live rock for removal off larger structures is prohibited north of Pasco County, Florida.**

**Preferred Alternative D.2: Live rock harvest is permitted in the Gulf of Mexico EEZ only from Collier County through Levy County until 1997. Chipping of live rock is allowed in this area. Elsewhere in the Gulf EEZ live rock harvest or possession is prohibited.**

The preferred alternative would reduce the areas open to harvest of wild live rock. Specifically it would ban harvest of wild live rock in the Panhandle area of Florida. But it would unlikely

reduce the total harvest of wild live rock in the Gulf area. Table 3 shows that harvest of wild live rock in the Panhandle area is relatively small compared to total harvest in the open areas in the Gulf, and thus can be readily compensated by increases in harvest in other areas. To the extent that production in other Gulf areas increases, especially when the South Atlantic area is closed, total production and, to a large extent, producer surplus will not significantly decrease under the preferred alternative.

The adverse effects of the preferred alternative would be limited to those harvesters operating in the Panhandle area. There are about 5 permittees operating in this area, and they will either have to relocate farther south or cease operation entirely. In any event, their operation costs would increase.

The corresponding benefits from the preferred alternative would be in terms of preventing a decrease in non-consumptive values. These values are derived by individuals diving or fishing in the affected areas. Live rock is reportedly not as abundant in EEZ off the Panhandle area as in the other open areas, so that taking of live rocks in such area would entail more damage to the resource and the habitat. Under status quo, however, this damage is partly alleviated by the ban on chipping rocks in the subject area so that the benefits from a total harvest ban are possibly small although it may still outweigh the costs to the affected producers.

Alternative D.2 would force wholesalers operating in the area to cease operation or incur higher costs if they start getting their supply from farther areas. Consumers, however, may not be adversely affected by this option to the extent that most of them are not located in the Panhandle area.

## **E. Personal Use Harvest of Live Rock**

**Preferred Alternative E.1: Status Quo. Prohibit the harvest of wild live rock for personal use. No take of live rock is allowed without a permit.**

**Alternative E.2: A personal use harvest and possession of up to a two gallon (0.27 cubic foot) (or more) bucket container of live rock is allowed per person per day during the terminal harvest period in the EEZ. No wild harvest permit is required. Sale of such material is prohibited.**

**Alternative E.3: A personal use harvest and possession of up to a two-gallon (0.27 cubic foot) (or more) bucket container of live rock is allowed per person per day in the EEZ. Sale of such material is prohibited. No wild harvest permit is required.**

**Alternative E.4: A personal use harvest and possession of up to a two-gallon bucket container of live rock is allowed per vessel per day in the EEZ of the Gulf of Mexico (a. through 1996 or b. indefinitely). Sale is prohibited.**

**Alternative E.5: A personal use permit is required to take live rock in limited quantities specified for one's personal use.**

Recreational harvesters are bound to benefit from any of the options allowing recreational harvest. The extent of these benefits is not known but is expected to increase in the future as more individuals enter the fishery.

The short-term effect of providing for recreational harvest in the Gulf of Mexico is probably minimal if we assume negligible recreational effort in the fishery at the present time. A likely scenario over the long-run is an increase in recreational effort due to a possible entrance of many participants. Such increase in effort may be substantial as to result in significant cumulative loss of reef-like habitat over a period of years. This can only obviate the benefits (discussed in Amendment 2) from an eventual prohibition of commercial wild rock harvest. The long-run outlook is then very likely a reduction in economic benefits that may outweigh short-term gains. In addition, there is a good chance that any allowance for recreational harvest would complicate enforcement of the ban on commercial wild rock harvest. In addition, it may have negative impacts on commercial lease sites when aquaculture becomes the only source of commercial harvest of live rock in the Gulf.

**Government Costs of Regulation**

The preparation, implementation, enforcement and monitoring of this or any federal action involves the expenditure of public and private resources which can be expressed as costs associated with the regulations. Costs associated with this amendment include:

Council costs of document preparation, meetings, public hearings, and information dissemination .....	\$ 15,000
NMFS administrative costs of document preparation, meetings and review .....	8,000
Law enforcement costs .....	7,000
Public burden associated with permits .....	none
NMFS costs associated with permits .....	none
TOTAL .....	<u>\$ 30,000</u>

The cost items above have been identified as the likely cost to be incurred in preparing and implementing this plan amendment. Council and NMFS costs associated with the preparation of this amendment are \$23,000. The additional cost of enforcement is primarily attributed to the imposition of a quota. This cost is estimated at \$7,000. There are no additional permits required under this amendment.

**Summary and Expected Net Impact of Proposed Alternatives**

The proposed regulatory action constitutes changes in management for wild live rock harvests in the EEZ under the jurisdiction of the Gulf Council. The emphasis of the summary is on the expected economic impact of the various options.

The proposed quota under Preferred Alternative A.2 will constrain harvest in the Gulf area to the 1994 harvest level. Ex-vessel revenues may slightly increase under this alternative although such revenue increases can be attributed more to increasing demand. Industry production costs are not expected to increase in 1995, the first year the quota is implemented. But in 1996 such costs are expected to increase as more harvesters transfer their effort to the Gulf area when the South Atlantic area is closed to all commercial harvest of wild live rock. If a derby situation ensues, revenues per vessel will tend to fall. Alternative A.1 (status quo), on the other hand, would accommodate new entrants into the Gulf fishery in a manner that would not necessarily increase per vessel cost of production. Industry cost, however, will increase as harvest increases. While industry profitability then will not improve under status quo, the resulting increase in harvest under this measure would have some non-negligible adverse impacts on non-consumptive use.

Trip limits are bound to penalize larger vessels in the fishery. To the extent, however, that most operators in the wild live rock fishery use relatively small vessels, the current trip limit (Alternative B.1) is not restrictive for most operators. Maintaining this trip limit would have no effects on producer surplus in 1995, but it may reduce producer surplus in 1996 when a derby situation materializes. In this regard, lower trip limits as proposed under Alternative B.2 may possibly extend the season and prevent a significant reduction in producer surplus.

Alternative C.1 would make pertinent Gulf rule consistent with that of the South Atlantic and that of the Florida rule. This has some unknown adverse effects on the industry.

Alternative D.2, which proposes to close the Florida Panhandle to commercial harvest of wild live rock, is not expected to have a significant adverse impacts on total industry harvest and producer surplus, because this area has traditionally accounted for a relatively small percentage of total harvest. However, it would force about 5 permittees to either relocate or cease operation. Considering that chipping is already prohibited in this area, the benefits from a total ban on harvest of wild live rock in this area are possibly small although it may outweigh the costs to the affected harvesters.

Allowing limited recreational harvest of wild live rock (Alternatives E.2, E.3, E.4 and E.5) may have minimal adverse effects in the short run, but such effects could escalate if effort from this segment of the fishery substantially increases. A substantial increase in recreational harvest would simply obviate the benefits from the total ban on commercial harvest of wild live rock. In addition, such increase would tend to complicate enforcement of the commercial ban on harvest of wild live rock and may also have negative effects on commercial lease sites for aquaculture.

### **Determination of a Significant Regulatory Action**

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: a) an annual effect on the economy of \$100 million or more; b) a major increase in

costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or c) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The entire Florida commercial harvest sector of the live rock fishery is valued at about \$1.14 million ex-vessel. The Gulf harvests are valued at \$0.63 million. Either figures are significantly less than \$100 million. Given the size of the fishery and the segment of the fishery, i.e., Gulf area, directly affected by the proposed regulation, it is concluded that any revenue or cost impacts on the fishery would be significantly less than \$100 million annually.

The harvest quota would restrict harvesters to the 1994 level, and in this sense the industry is not expected to suffer reductions in revenues. The proposed closure of the Panhandle area would impose a major cost on about 5 permittees, but such increase in cost is not expected to result in a major cost increase for the industry as a whole. Restricting harvest to the current take of wild live rock is also not expected to result in price increases for the consumers. The ban on harvest in the Panhandle area would have a significant adverse effect on employment, productivity, and investment for the 5 permittees mentioned, but such effects would unlikely translate to major changes for the industry as a whole. To some extent the quota would render the domestic industry less competitive in the international market, specifically in Canada and England. This amount is not known but is deemed to be not significant.

Based on the foregoing, it is concluded that this regulation if enacted would not constitute a "significant regulatory action." It may be recalled, however, that the total ban on harvest of wild live rock by 1997 was previously determined to have significant regulatory effects.

## **Initial Regulatory Flexibility Analysis**

### **Introduction**

The purpose of the Regulatory Flexibility Act is to relieve small businesses, small organizations, and small governmental entities from burdensome regulations and record keeping requirements. The category of small entities likely to be affected by the proposed regulatory amendment is that of commercial businesses currently engaged in the harvest of live rock. The impacts of the proposed action on these entities have been discussed above. The following discussion of impacts focuses specifically on the consequences of the proposed action on the mentioned business entities. An Initial Regulatory Flexibility Analysis (IRFA) is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." Although an IRFA focuses more on adverse effects, determination of beneficial significant effects is also an integral component of the analysis. In addition to analyses conducted for the Regulatory Impact Review (RIR), the IRFA provides an estimate of the number of small businesses affected, a description of the small businesses affected, and a discussion of the nature and size of the impacts.

### **Description of Economic Impact on Small Entities**

In general, a "substantial number" of small entities is more than 20 percent of those small entities engaged in the fishery (NMFS, 1992). As of March 1995 there are 62 permitted vessels which are, at least on a part-time basis, engaged in the harvest of live rock. Of these permittees, 22 owners reside in the Gulf area and are the entities directly affected by the proposed regulation. The Small Business Administration (SBA) defines a small business in the commercial fishing activity as a firm with receipts of up to \$2.0 million annually. Since the proposed action will affect all participants of the live rock harvest sector in the Gulf area, the "substantial number" criterion will be met.

Economic impacts on small business entities are considered to be "significant" if the proposed action would result in any of the following: a) reduction in annual gross revenues by more than 5 percent; b) increase in total costs of production by more than 5 percent as a result of an increase in compliance costs; c) compliance costs as a percent of sales for small entities are at least 10 percent higher than compliance costs as a percent of sales for large entities; d) capital costs of compliance represent a significant portion of capital available to small entities, considering internal cash flow and external financing capabilities; or e) as a rule of thumb, 2 percent of small business entities being forced to cease business operations (NMFS, 1992).

Since the proposed quota is set at the 1994 harvest, revenues to the industry may not be reduced by more than 5 percent. However, there is a good chance that the ban on commercial harvest in the Panhandle would reduce by more than 5 percent the revenues of the 5 eligible participants. In addition, if these harvesters choose to relocate, they will likely incur a significant increase in the operating and capital costs. Considering that all participants in the commercial live rock harvest fishery may be deemed small business entities, the issue of big versus small business operations is not relevant in determining distributional/regional effects of regulations, and it thus also rules out disproportionate effects on capital costs of compliance. A number of current participants of the live rock harvest industry may be forced to cease business or switch to other operations once the ban on wild live rock harvest in the Panhandle area becomes in place. This number could be as much as 5 entities, a number more than 2 percent of the 22 entities operating in the Gulf area.

It can be inferred from the foregoing discussion that the proposed regulation can be expected to result in a significant economic impact on a substantial number of small entities in the commercial live rock harvest sector. On this account, an IRFA has been prepared. The following comprises the remaining portions of the IRFA.

### **Explanation of Why the Action is Being Considered**

Refer to the section on Problems and Objectives in the RIR and to Section I of the amendment document.

### **Objectives and Legal Basis for the Rule**

Refer to the section on Problems and Objectives in the RIR and to Section 1 of the amendment document. The Magnuson Fishery Conservation and Management Act of 1976 provides the legal basis for the rule.

## **Demographic Analysis**

Refer to the Coral Fishery Management Plan, as amended.

## **Cost Analysis**

Refer to the Government Cost and Summary sections of the RIR.

## **Competitive Effects Analysis**

The industry is composed entirely of small businesses (harvesters and charter boats operations). Since no large businesses are involved, there are no disproportional small versus large business effects.

## **Identification of Overlapping Regulations**

The proposed action does not create overlapping regulations with any state regulations or other federal laws. Some of the proposed options may even render federal and state (Florida) rules compatible.

## **Conclusion**

The foregoing information and pertinent portions of the RIR are deemed to satisfy the analysis required under the RFA.

## **V. ENVIRONMENTAL CONSEQUENCES**

A supplemental environmental impact statement was prepared for Amendment 2 which also addresses the issues and actions in this amendment. The "Final EIS on Amendment 2 to the Fishery Management Plan for Coral and Coral Reefs of the Gulf of Mexico and South Atlantic", FMFMC, 1994, is incorporated herein by reference. A summary of the environmental consequences of each alternative is shown in Table 4.

Habitat Loss: Hard bottoms and reef rubble from which live rock is removed contributes to the habitat for reef dwelling organisms which include reef fish and ornamental fishes and invertebrates. There is concern that the removal of this material degrades the value of the habitat due to the slow rate of regeneration of the material. There is an estimated 19,691 square miles of live bottom in the Gulf of Mexico.

Aquarium Sales: Harvest of live rock at a level of about 500 tons per year is said by producers to be the backbone of the marine aquarium trade because it allows appropriate habitat for captive tropical fishes and invertebrates. Harvest of naturally occurring rock could be replaced by material from aquaculture operations.

Ecosystem Management: An acceleration and continuation of removal of live rock can degrade the quality of fishery habitat, particularly if the activity is concentrated in high use areas.

Aesthetic Values: Removal of coral or damaging coral reefs is already prohibited by federal and Florida regulations. However, the removal of showy material in areas frequented by divers would contribute to aesthetic degradation.

Consistent Regulations: Other than this FMP, only the state of Florida currently regulates harvest of live rock. Florida prohibits removal in its waters since 1989 and proposed a phase-out of landings from the EEZ ending in 1995.

## **Environmental Impacts of Proposed Alternatives**

### **A. Annual Quota**

**Alternative A.1: Status Quo - no change. All harvest of wild live rock where allowed in the Gulf EEZ during phase-out is restricted by permit requirement, trip limit, area closure, and gear restriction. There is no annual quota. Optimum yield is unlimited through 1996.**

**Preferred Alternative A.2: Establish an annual quota of 500,000 pounds of wild live rock from open areas in the Gulf EEZ in 1995 and 1996 after which harvest will end. This amount is to be optimum yield during the phase-out after which OY is to be zero.**

A.1: Removal of live rock from allowable areas in the Gulf of Mexico would continue until 1997 restricted only by vessel license limitation and daily trip limits. Removal of live rock, estimated to have been about 500,000 pounds in 1994, could increase unchecked with accompanying loss of hard bottom used as habitat by reef dwelling organisms. Hard bottoms are also utilized by divers for aesthetic viewing. A large portion of the 19,691 square miles of hard bottom occurs in the allowable area. Individuals engaged in live rock aquaculture have deposited over three million pounds of rock off Florida's west coast which would tend to mitigate some of the loss.

A.2: The environmental impact of this option is identical to that of A.1 except that live rock removal is limited to 500,000 pounds in each of 1995 and 1996 limiting the environmental impact to that amount.

### **B. Trip Limits for Harvesting Wild Live Rock**

**Preferred Alternative B.1: No change - Permitted vessels are limited to 25 five-gallon buckets or an equivalent container volume (16.88 cubic feet) of wild live rock per daily trip in the Gulf of Mexico EEZ. This amounts to about 625 to 1,250 pounds per trip.**

**Alternative B.2: Limit permitted vessels to 10, 15, or 20 five-gallon buckets or an equivalent volume of wild live rock per daily trip in the Gulf of Mexico EEZ.**

B.1: Trip limits were originally established to restrict harvest in order to prevent excessive loss of hard bottom habitat. The setting of an annual harvest quota changes the impact of this alternative to an economic measure; because the quota becomes the controlling factor in total harvest level.

B.2: A reduced trip limit would have no effect on the annual harvest limited by a quota.

### **C. Base for Allowable Octocorals**

**Preferred Alternative C.1: Allowable octocorals means erect, non-encrusting species of the subclass Octocorallia, except the prohibited sea fans Gorgonia flabellum and G. ventalina, including only the substrate covered by and within one-inch of the holdfast.**

**Alternative C.2: Status Quo. Allowable octocorals means erect, non-encrusting species of the subclass Octocorallia, except the prohibited sea fans Gorgonia flabellum and G. ventalina, including only the substrate covered by and within three inches of the holdfast.**

C.1: This measure is an enforcement tool to prevent the take of live rock in closed areas as a bycatch in octocoral harvest. It will protect live rock in closed areas during the phase-out and throughout the EEZ after phase-out. The reduction of the size of the allowable anchor rock is not significant but is consistent with Florida's regulation.

C.2: This allows a slightly larger octocoral anchor than Alternative C.1.

## **D.Live Rock Harvest off Florida's Panhandle**

**Alternative D.1: Status Quo.** Live rock harvest is allowed in the EEZ along Florida's west coast except for Monroe County until 1997. Chipping of live rock for removal off larger structures is prohibited north of Pasco County, Florida.

**Preferred Alternative D.2:** Live rock harvest is permitted in the Gulf of Mexico EEZ only from Collier County through Levy County until 1997. Chipping of live rock is allowed in this area. Elsewhere in the Gulf EEZ live rock harvest or possession is prohibited.

D.1:This alternative would allow the continued removal of loose live rock from hard bottoms under the quota until 1997. Approximately 45,000 pounds are removed annually from this area. Chipping is prohibited to protect ledge outcroppings. The harvest area i.e., the EEZ, begins at about 100 feet in depth which is below the area visited by most recreational SCUBA divers.

D.2:Live rock is less abundant off the Panhandle than it is further south off Florida's central Gulf coast. Thus, the hard bottom has greater value for fish habitat and attraction. Closure during the final year of phase-out would reduce the removal of loose material off the Panhandle by about 45,000 pounds.

## **E.Personal Use Harvest of Live Rock**

**Preferred Alternative E.1: Status Quo.** Prohibit the harvest of wild live rock for personal use. No take of live rock is allowed without a permit.

**Alternative E.2:** A personal use harvest and possession of up to a two-gallon (0.27 cubic foot) (or more) bucket container of live rock is allowed per person per day during the terminal harvest period in the EEZ. No wild harvest permit is required. Sale of such material is prohibited.

**Alternative E.3:** A personal use harvest and possession of up to a two-gallon (0.27 cubic foot) (or more) bucket container of live rock is allowed per person per day in the EEZ. Sale of such material is prohibited. No wild harvest permit is required.

**Alternative E.4:** A personal use harvest and possession of up to a two-gallon bucket container of live rock is allowed per vessel per day in the EEZ of the Gulf of Mexico (a. through 1996 or b. indefinitely). Sale is prohibited.

**Alternative E.5:** A personal use permit is required to take live rock in limited quantities specified for one's personal use.

E.1:This alternative would continue to limit access to live rock harvest to those permitted commercial vessels through the phase-out period. The amount of harvest for personal use prior to regulation is not documented but is believed to be small.

Maintaining prohibition of personal use harvest continues to eliminate that unquantified loss. Amateur collectors are less likely to be able to identify prohibited corals on live rock than professional collectors.

E.2 - E.5: These alternatives allow some amount of personal use harvest over various periods, all of which would initiate additional but unquantifiable harvest of rock. This removal in itself may be insignificant, but it introduces possible abuse and enforcement difficulties which could result in habitat degradation.

**TABLE 4**  
 Summary of Environmental Consequences  
 Effects of Live Rock Alternatives on the Issues  
 \*Indicates Preferred Alternatives

Alternative	Habitat Loss	Aquarium Sales	Aesthetic Values	Consistent Regulations
A.1 No Quota	Continues through 1996 regulated by trip limits and limited access	Continue with conversion to aquaculture	Decrease through 1996	Florida adopted a diminishing phase-out quota ending in 1995
A.2* 500,000 pound annual quota	Limited to annual quota through 1996	Continue at current level with conversion to aquaculture	Decrease through 1996	Same as A.1
B.1* Trip limits - status quo	Regulated and terminated by 1997	Same as A.2	Decrease through 1996	Extends harvest through 1996 (18 months)
B.2 Decrease in trip limits	No change	Higher Costs	No change	Same as B.1
C.1* One-inch base for octocorals	Small reduction in loss	No change	Small gain	Consistent
C.2 Status quo, 3-inch base on octocorals	Small loss	No change	Small loss	Inconsistent
D.1 Status quo, Panhandle open	Continues through 1996	Continues with conversion to aquaculture	Decrease through 1996	Inconsistent through 1996
D.2* Panhandle closed	Terminates in Panhandle in 1995	Terminates in Panhandle	Loss ends in 1995	Consistent in Panhandle
E.1* Status quo, no personal use harvest	Terminated in 1994	Slightly increased	Loss ended in 1994	Consistent
E.2 Personal harvest allowed through 1996	Small loss	No change	Small loss ends in 1996	Inconsistent
E.3 Indefinite duration of personal harvest	Small continuing loss	Very small loss	Small loss	Inconsistent
E.4.a Vessel limit on personal harvest through 1996	Small loss through 1996	Very small loss	Small loss	Inconsistent

E.4.b Same as E.4.a but continuing indefinitely	Small continuing loss	Very small loss	Continuing small loss	Inconsistent
E.5 Personal use permit	Small loss	Very small loss	Small loss	Inconsistent but more enforceable

## **Conclusion**

Habitat of the Stocks - Since corals are sessile animals the FMP section on Description of the Stocks (5.0) and the FMP section on Description of the Habitat (6.0) adequately describe the habitat of the stocks (105 pages in aggregate), including condition of the stocks as well as man-induced and natural impacts to the habitat. Amendment 1 modified the FMP by including the following updated revised subsections: 6.4 Habitat Information Needs; 6.5 Habitat Protection Programs; and 6.6 Habitat Recommendations. These revisions are in Appendix A of Amendment 2.

Physical Environment - The proposed actions in this amendment will have no long-term adverse impact on the physical environment.

Fishery Resource - The proposed actions are intended to maintain the coral, coral reefs, and live rock resources and to prevent them from becoming overfished.

Human Environment - Some marine life fishermen would be affected by restrictions intended to conserve live rock. Long-term benefits are expected to exceed short-term loss.

Effect on Wetlands - The proposed amendment will have no effect on any flood plains, wetlands, trails, or rivers.

Mitigating Measures Related to the Proposed Action - The annual quota is designed to mitigate adverse effects of continuing live rock collections. Aquaculture also enhances the hard bottom habitat and tends to mitigate earlier loss from harvest of the natural live rock. Aquaculture also reduces the economic loss to live rock harvesters who are displaced from harvest of naturally occurring material and who elect to convert to aquaculture.

Unavoidable Adverse Effects - Harvest of an annual quota will be limited to Florida's west coast from Collier through Levy Counties through 1996. An estimated five individuals currently eligible for wild live rock harvesting permits will have to move their operations south of Levy County.

Relation Between Local, Short-Term Users of the Resource and Enhancement of Long-Term Productivity Current harvesters of live rock will be phased out of taking wild live rock after 1996 in the Gulf of Mexico. Harvesting north and west of Levy County, Florida in the Gulf of Mexico will be terminated upon implementation of this amendment. Harvesters are afforded the opportunity to convert to aquaculture as a long term venture to continue production of live rock.

Irreversible or Irretrievable Commitment of Resources - There are not expected to be any irreversible or irretrievable commitments of resources in addition to increased costs of enforcement.

## Recommendation

### Finding of No Significant Environmental Impact

In view of the analysis presented in this document, I have determined that the proposed action in this amendment to the fishery Management Plan for Gulf Shrimp would not significantly affect the quality of the human environment with specific reference to the criteria contained in NAO 216-6 implementing the National Environmental Policy Act. Accordingly, the preparation of a Supplemental Environmental Impact Statement for this proposed action is not necessary.

Approved: \_\_\_\_\_  
Assistant Administrator for Fisheries

Date

## VI. TIME AND LOCATION OF PUBLIC HEARINGS

### Tampa, Florida

March 1, 1995  
7:00 p.m.  
Ramada Airport Hotel  
5303 West Kennedy Boulevard

### Destin, Florida

March 2, 1995  
7:00 p.m.  
Holiday Inn  
1020 Highway 98E

### New Orleans, Louisiana

March 15, 1995  
8:45 a.m.  
Holiday Inn Downtown - Superdome  
330 Loyola Avenue

## **Responsible Agencies**

Gulf of Mexico Fishery Management Council  
Lincoln Center, Suite 331  
5401 West Kennedy Boulevard  
Tampa, Florida 33609  
813-228-2815

National Marine Fisheries Service, Southeast Regional Office  
9721 Executive Center Drive  
St. Petersburg, Florida 33702  
813-893-3141

## **VII. LIST OF PREPARERS**

Georgia Cranmore, Ecologist, National Marine Fisheries Service, Southeast Regional Office  
Antonio Lamberte, Fishery Economist, Gulf of Mexico Fishery Management Council  
Terrance Leary, Fishery Biologist, Gulf of Mexico Fishery Management Council  
Martha Norris of the Florida Department of Environmental Protection provided data on live rock landings.

## **VIII. LIST OF AGENCIES AND ORGANIZATIONS CONSULTED:**

Gulf of Mexico Fishery Management Council  
- Coral Advisory Panel  
- Law Enforcement Advisory Panel  
- Scientific and Statistical Committee

National Oceanic and Atmospheric Administration (NOAA)  
- Office of General Counsel (SER)  
- Florida Keys National Marine Sanctuary

National Marine Fisheries Service (SER)  
- Southeast Regional Office  
- Southeast Fisheries Center

Florida Marine Fisheries Commission

Florida Marine Life Association  
Florida Marine Aquarium Society  
Project Reefkeeper  
Reef Relief  
Florida Live Rock Alliance  
The Nature Conservancy  
American Aquarist Society  
Florida Association of Dive Operators  
Center for Marine Conservation  
Coral Reef Community Foundation

## **IX. OTHER APPLICABLE LAW**

Impacts on Other Fisheries - Unregulated removal of live rock could reduce the available hard bottom habitat for reef fish and invertebrates and subject coral reefs to damage from collectors. Regulated harvest would reduce this adverse impact. Aquaculture by introduction of cultch material has the potential of increasing the hard bottom habitat for reef dwelling species.

Data Needs - Data needs and responsibilities are listed in Appendix A of Amendment 2.

Vessel Safety - The proposed actions do not impose requirements for use of unsafe (or other) gear nor do they direct fishing effort to periods of adverse weather conditions.

Paperwork Reduction Act - No additional reporting requirement proposed.

Coastal Zone Management Consistency - The Assistant Administrator has determined that this proposed action will be implemented in a manner that is consistent to the maximum extent practicable with the approved coastal zone management program of the affected states in the management area. This determination has been submitted for review by the states under Section 307 of the Coastal Zone Management Act.

Federalism - This proposed action does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under E.O. 12612.

Effect on Endangered Species and Marine Mammals - Marine mammals do not use coral reef or other hard bottom habitats and will not be directly or indirectly affected by the interim rule. Of the endangered or threatened species under NMFS jurisdiction, the hawksbill sea turtle (*Eretmochelys imbricata*) and the green sea turtle (*Chelonia mydas*) may use these areas for foraging and shelter and could be affected by destruction of live rock habitat. However, the magnitude of such effects at current live rock collection levels is not expected to be significant. Therefore, the proposed amendment will have no significant effect on endangered species and marine mammals. A Section 7 consultation was held for Amendments 1 and 2 with a "no jeopardy opinion" being rendered. The proposed actions do not alter provisions of the FMP that would affect these animals.

## **X. REFERENCES**

Andrews, C. 1990. The ornamental fish trade and fish conservation. *Journal of Fish Biology* 37 (Supplement A), 53-59.

Bailey, Tom., 1993. *Reefs Wrecks & Rigs, Diver's Guide to the Northern Gulf of Mexico*. Seacoast Publishing Inc., Birmingham, Alabama.

Blackburn. August 1988. The Ecological Use of Live Rock. *Fresh Water and Marine Aquarium* Vol. II, No. 8.

Derr, M. 1992. Raiders of the reef. *Audobon*, 48, March/April, 1992.

Feddern, H., 1994, pers. comm., Tavernier, FL.

Gulf of Mexico Fishery Management Council 1981. Fishery Management Plan for Gulf of Mexico Reef Fish Resources. (GMFMC.) Tampa, FL.

Gulf of Mexico Fishery Management Council. 1994. Amendment 2 to the Fishery Management Plan for Coral and Coral Reefs of the Gulf of Mexico Reef and South Atlantic. 5401 W. Kennedy Blvd., Ste. 331, Tampa, FL 33609.

Moe, M.A. Jr. 1989. The Marine Aquarium Reference, Systems and Invertebrates. Green Turtle Publications, Plantation, FL.

National Marine Fisheries Service. 1992. Appendix 2.d: Guidelines on regulatory analysis of fishery management actions. In **Operational guidelines for fishery management plan process.** NMFS, Silver Spring, Maryland.

Setwart, R. Jr., pers. comm. Noyes Marine Life, Fort Lauderdale, FL.

Turner, J., pers. comm. Exotic Aquaria, North Miami Beach, FL.

## **XI.FIGURES (Attached)**

coral\amend3.f95 cmj plb ccm