REGULATORY AMENDMENT #1

TO THE

SPINY LOBSTER FISHERY MANAGEMENT PLAN

FOR THE

GULF OF MEXICO AND SOUTH ATLANTIC

(Includes Environmental Assessment,
and Regulatory Impact Review)

MAY 1992

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This is a publication of the Gulf of Mexico and South Atlantic Fishery Management Councils pursuant to National Oceanic and Atmospheric Administration Award Numbers NA17FC0041 and NA17FC0042, respectively.

TABLE OF CONTENTS

1. HISTORY OF MANAGEMENT

The Fishery Management Plan for Spiny Lobster in the Gulf of Mexico and South Atlantic (FMP) was implemented on July 26, 1982 (47 FR 29203). The FMP largely extended Florida's rules regulating the fishery to the EEZ throughout the range of the fishery, i.e. North Carolina to Texas. The FMP has been amended three times. Amendment 1 was implemented on July 15, 1987 (52 FR 22659) with certain rules deferred and implemented on May 11, 1988 (53 FR 17196) and on July 30, 1990 (55 FR 26448). This amendment updated the FMP rules to be more compatible with that of Florida (State). Amendment 2 was approved on October 27, 1989 (54 FR 48059) and provided a regulatory amendment procedure for instituting future compatible State and federal rules without amending the FMP.

Amendment 3 was implemented on March 25, 1991 (56 FR 12357) and contained provisions for adding a scientifically measurable definition of overfishing, an action plan to prevent overfishing, should it occur, as required by the Magnuson Act National Standards (50 CFR Part 602), and the requirement for collection of fees for the administrative cost of issuing permits.

The FMP, as amended, provides for management of the fishery throughout its range from North Carolina through Texas. However, the commercial fishery and, to a very large extent, the recreational fishery, occur off South Florida and principally off Monroe County in the Florida Keys (96 percent of landings in 1984).

The FMP (1981), Amendment 1 (1987), and Amendment 2 (1989) adequately describe the fishery, changes in the fishery and utilization patterns and the condition of the stock. In summary, this information indicates that (1) the fishery is heavily overcapitalized with excess fishing capacity (traps) well beyond that needed to harvest the resource; (2) although landings have been stable and no recruitment overfishing is occurring, growth overfishing is occurring partially as a result of mortality of sublegal lobster from fishing practices; (3) the fishery landings are dependent on recruitment of small lobster each year, i.e. no multiple age class structure; (4) source of larval recruitment to the fishery has not been resolved, i.e., pan-Caribbean or Gulf or local or a combination of sources; and (5) a trap effort reduction system has been developed by industry and the State of Florida. (state)

2. PROBLEMS REQUIRING PLAN AMENDMENT

This regulatory amendment addresses: (1) extension of the Florida spiny lobster trap certificate system for reducing the number of traps in the commercial fishery to the EEZ off Florida; (2) revision of the FMP commercial permitting requirements; (3) limitation of the number of live undersize lobster used as attractants for baiting traps; (4) specification of gear allowed for commercial fishing in the EEZ off Florida; (5) specification of the possession limit of spiny lobsters by persons diving at night; (6) requirement of lobsters harvested by divers be measured without removing from the water; and (7) specification of uniform trap and buoy numbers for the EEZ off Florida. All of these changes are being proposed through the framework procedure of the FMP as established by Amendment 2. (See Section 3.D).

As indicated in the preceding section, the spiny lobster commercial industry, in coordination with the Florida Marine Fisheries Commission (FMFC), developed a trap certificate program to reduce the excessive number of traps deployed in the fishery. The program was enacted by the Florida legislature and becomes fully effective July 1, 1992 (Note: Season begins August 6, 1992). Analyses in the FMP indicated that approximately 200,000 traps were required to harvest the average annual landings, which stabilized in the mid 1970s. Although the number of traps has increased significantly since the 1970s, landings have not increased appreciably. FMFC estimates the number of traps that will achieve optimum yield ranges from 172,000 to 375,000. Muller (1990) estimated from landings records that there were 850,000 traps used in the fishery in the 1988-1989 season. NMFS estimated 636,000 and 662,000[1] traps were deployed in the fishery in 1988-1989 and 1989-1990, respectively (Harper, 1991). The number of trap tags issued through November, 1991 exceeded 1.3 million, but it is unlikely that many traps are being fished. Many of the tags were probably requested because of the erroneous conception that the number possessed would affect allocation of trap certificates under the State trap certificate program (O'Hop, Pers. Comm.). As indicated in Amendment 2, the excessive number of traps results in mortality of undersize lobsters and prevents the fishery from attaining a greater yield from the stock. The amendment proposes to require that persons fishing traps in the EEZ off Florida possess a trap tag issued by the State for each trap. Since such persons must possess trap certificates for each trap and such certificates may be sold or leased, this amendment also proposes to modify the FMP commercial vessel permit requirement so it does not apply to persons fishing traps in the EEZ off Florida.

Federal and State rules differ in regard to the number of undersize lobster that may be possessed in the live well on board vessels and utilized as attractants for baiting traps. This amendment proposes to standardize these measures. Currently, the differing rules make enforcement of the Florida rule very difficult. Modifying the FMP provision to conform with that of the State will reduce the mortality of undersize lobsters, increasing overall yield from the fishery.

Currently, the FMP does not specify the gear which may be used to commercially harvest spiny lobster but only provides that traps have a degradable panel and that spears or other instruments that pierce the shell not be used. FMFC has recently specified gear that may be used, limiting it to that gear which inflicts the least amount of mortality on the harvested lobster. This amendment specifies the gear that may be utilized in the EEZ off Florida.

Concern has been raised by the trap fishermen that divers harvesting lobster at night may be taking lobster from traps. This amendment proposes to limit diving harvest in the EEZ at night to the bag limit to address this problem and would facilitate Florida's enforcement of this requirement at dockside.

This amendment proposes to require that divers measure the carapace length of lobsters while in the water to reduce handling and exposure mortality of undersize lobsters. This amendment also proposes to standardize the size of trap and buoy identification numbers.

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[1] Preliminary estimate.

3. PROVISIONS OF THE FMP

The following provisions of the FMP, as amended, are presented as background to discussions in this amendment.

A. Problems and Issues in the Fishery

Problems currently identified in the FMP are as follows:

1. The number of undersize lobster taken or sold illegally continues to be a problem.

2. Whereas the present practice involving the use of undersize lobster as attractants is causing significant mortality to undersize lobsters and subsequent loss in yield to the fishery, there is controversy over the methods to reduce the mortality of undersize lobster used as attractants in traps.

3. There is an excessive number of traps in the fishery.

4. Incompatible federal and State regulations hinder effective management and enforcement, and delay in implementing federal rules compatible with those of the State exacerbates this problem.

5. Abandonment of traps creates some ghost fishing mortality that also represents loss in yield to the fishery.

6. The major user groups of the resource are not adequately defined to ensure fair and equitable treatment. The existing Florida permit system is not sufficient in identifying major user groups resulting in an inability to properly assess the impacts of alternative management measures on the users of the resource. While tagging studies indicate that the recreational harvest is likely to be about ten percent of the commercial harvest, additional data on the recreational harvest is needed. Existing data sources will need to be supplemented, especially as future allocations of the resource are considered. (Note: By current State rule, commercial fishermen must have both permit and saltwater products license.)

7. The increasing recreational harvest, especially in the special season, may be impacting the resource and needs to be evaluated as to amount of harvest and impacts on handling and undersize lobster mortality.

B. Management Objectives

Management objectives currently identified in the FMP are as follows:

1. Protect long-run yields and prevent depletion of lobster stocks.

2. Increase yield by weight from the fishery.

3. Reduce user group and gear conflicts in the fishery.

4. Acquire the necessary information to manage the fishery.

5. Promote efficiency in the fishery.

6. Provide for a more flexible management system that minimizes regulatory delay to assure more effective, cooperative State and federal management of the fishery.

C. Optimum Yield (OY)

OY is all spiny lobster with carapace or tail lengths equal to or larger than the minimum legal lengths[2] that are harvested legally under the provisions of the FMP. OY is estimated at 9.5 million pounds.

D. Protocol and Procedure for an Enhanced Cooperative Management System

Under this regulatory amendment procedure each proposed rule or set of rules must be adopted by the State through their hearing process and be submitted to NMFS and the councils along with socioeconomic analyses, hearing summaries, and other supporting information. The Councils and NMFS must concur that the proposed rule is consistent with the FMP objectives and other federal law. NMFS, the Councils' staffs and FMFC staff will prepare the regulatory amendment and supporting documentation. This documentation will include an EA and RIR which examine in detail the environmental, social and economic impacts of each proposed rule and the alternatives to the rule. The rules implemented will be subject to approval by NMFS after review of public comment submitted directly to NMFS during the comment period on the regulatory amendment.

PROTOCOL:

The Councils, FMFC and NMFS hereby adopt the following protocol which describes the roles of the federal and State governments:

1. The Councils and NMFS acknowledge that the fishery is a State fishery (which extends into the EEZ) in terms of current participants in the directed fishery, major nursery, fishing, and landing areas, historical regulation of the fishery, and is a fishery requiring cooperative State/federal efforts for effective management through a FMP.

2. The Councils and NMFS acknowledge that the State is managing and will continue to manage the resource to protect and increase the long-term yields and prevent depletion of the lobster stocks and that the State Administrative Procedure Act and rule implementation procedures, including final approval of the rules by Governor and Cabinet provide ample and fair opportunity for all persons to participate in the rulemaking procedure.

[2]Current minimum legal size specified in the regulations is 3.0 inches carapace length (or 5.5 inches tail length if harvested under tailing permit provisions).

3. FMFC acknowledges that rules proposed for implementation under this amendment must be consistent with the management objectives of the FMP, the National Standards, the Magnuson Act and other applicable federal law. Federal rules will be implemented in accordance with regulatory amendment procedures.

4. The Councils and NMFS agree that for any of the rules defined within this amendment that the State may propose the rule directly to NMFS, concurrently informing the Councils of the nature of the rule and that NMFS will implement the rule within the EEZ provided it is consistent under the protocol number 3. If either of the Councils informs NMFS of their concern over the rule's inconsistency with protocol number 3, NMFS will not implement the rule until the Councils, FMFC, and NMFS or their representatives meet and resolve[3] the issue.

5. The State will have the responsibility for collecting and developing the information upon which to base the fishing rules, with assistance, as needed by NMFS and cooperatively share the responsibility for enforcement with federal agencies.

6. FMFC will provide to NMFS, and to the Council written explanations of its decisions related to each of the rules (including a statement of the problem that the rulemaking addresses, how the rule will solve the problem, and how interested parties were involved in the rulemaking), summaries of public comments, biological, economic and social analyses of the impacts of the proposed rule and alternatives, and such other information that is relevant.

7. The rules will apply to the EEZ for the management area (N.C. to Texas) unless the Regional Director, NMFS, determines they may adversely impact other state and federal fisheries. In that event, the RD may limit the application of the rule, as necessary, to address the problem.

8. The NMFS agrees that its staff will prepare the proposed federal rule. The Councils agree that their staffs with assistance by the staffs of FMFC and NMFS will prepare the EA/RIR and other documents required in support of the rule.

PROCEDURE:

1. This procedure will function under and be governed by the protocols for cooperative management agreed upon by the FMFC, the Councils, and NMFS.

2. Based on the best available scientific information, the State of Florida's Marine Fisheries Commission (FMFC) will develop alternative proposed rules and socioeconomic analyses on the effects of these alternatives, hold public hearings (as required by Florida's Administrative Procedure Act), and at a final hearing select each preferred alternative rule for recommendation to the Florida Governor and Cabinet for implementation. After approval of the rule or rules by the Governor and Cabinet, the FMFC will advise the Councils and Regional Director (RD), NMFS of the recommended

[3]The issue will not be resolved until the Councils have withdrawn their objections.

rule(s) and proposed implementation date and will provide to the RD and to the Councils the analyses of the effects and impacts of the recommended and alternative rules and summaries of public comment. For rules to be implemented by the start of the fishing season (currently August 1), FMFC must complete these actions on or before February 1. The Councils will submit the rule and supporting analyses to the SSCs who will advise the RD, through the Councils, of the scientific validity of the analyses. The Councils will also submit the rule and supporting analyses to the advisory panels for comment.

3. The RD will review the recommended rule, analyses, and public record, and if he preliminarily determines that the rule is consistent with the objectives of the FMP, the National Standards, and other applicable law, he will notify the Councils and FMFC of his intent to implement the rule in the EEZ. If in the judgment of the RD, the rule or its supporting record are not consistent with these statutory criteria or the FMP objectives, he will immediately notify the Council and the FMFC of the deficiencies in the rule or supporting record. The FMFC may submit additional information or analyses to correct the deficiencies in the record.

4. When in the judgment of either of the Councils the rule is not consistent with the Magnuson Act or the objectives of the FMP, they will inform the RD and FMFC. In this case the RD will not proceed with implementation of the rule until this issue has been resolved.[4]

5. When the RD has preliminarily concluded the rule is acceptable, he will draft and publish the proposed rule for implementation by regulatory amendment. Based on State analyses of impacts, the Councils' staffs, with assistance from FMFC, will prepare the supporting documentation [EA/RIR, etc.] that accompany the proposed rule. The effective date of rules promulgated under this procedure will be the starting date of the next fishing season following approval of the regulatory amendment unless otherwise agreed upon by FMFC, the Councils, and the RD. A reasonable period for public comment on the proposed rule shall be provided.

   After reviewing public comment if the RD has concluded the rule is not consistent with the FMP objectives, the National Standards, other applicable law, or the provisions of this procedure, he will notify the Councils and FMFC of the fact and/or the need for proceeding with implementation by FMP amendment. If the supporting record is still deficient, he will delay taking action until the record has been supplemented by FMFC and/or Councils' staffs. If the RD has concluded the rule is consistent, he will publish the final rule.

6. PART A (GEAR RESTRICTIONS)

   Appropriate rules or regulatory changes that can be implemented under this part include:

[4]The issue will not be resolved until the Councils have withdrawn their objections.

a. Limiting the number of traps that may be fished by each vessel.
b. Describing the construction characteristics of traps, including requiring escape gaps.
c. Specification of gear and vessel identification requirements.
d. Specification of gear that may be utilized or prohibited in directed fishery and specification of bycatch levels that may be taken as incidental catch in non-directed fisheries.
e. Changes to soak or removal periods and requirements for traps.

PART B (HARVEST RESTRICTIONS)

Appropriate rules or regulatory changes that can be implemented under this part include:

a. Recreational bag and possession limits.
b. Changes in fishing seasons.
c. Limitations on use, possession, and handling of undersized lobsters.
d. Changes in minimum legal size.

4. PROPOSED MANAGEMENT ACTIONS

A. SPINY LOBSTER TRAP CERTIFICATE PROGRAM

1. Description of Program

- The Florida Department of Natural Resources (FDNR) shall establish the program beginning July 1, 1992.

- Certificates will be allocated to each license holder with a trap number.

- Initial allocations are based on each license holders trip ticket records for the three-year base period ending June 30, 1991.

- The sum of all license holders highest single license year landings divided by 700,000 is the trap/catch coefficient (e.g., 6,000,000 lbs./700,000 = 8.57).

- Initial number of trap certificates issued is determined by dividing the trap/catch coefficient into highest reported single license-year landings up to a maximum of 30,000 pounds (e.g., 30,000/8.57 = 3500 traps).

- After initial issuance, trap certificates are transferable on a market basis between license holders.

- License holders in or entering the fishery and fishing with gear other than traps are eligible to purchase certificates to fish with traps.

- Transfer fee of $2.00 per certificate is paid to FDNR.

- o Surcharge of 25 percent of notarized certificate sales value is assessed the first time a certificate is transferred outside the immediate family.

- o No entity can hold more than 1.5 percent of the total certificates in any license year.

- o Each trap shall have affixed thereto an annual trap tag issued each fishing year by FDNR.

- o Trap tag fees are initially 15 cents, increasing to $1.00 by 1998.

- o Persons with recreational fishing licenses may fish up to three tagged traps.

- o Certificates for which annual fees are not paid for three years revert to FDNR.

- o Each year the number of certificates of each holder shall be reduced by no more than ten percent until the reduction goal is reached.

- o FMFC will annually assess the reduction goal and the percentage reduction needed.

- o An appeals board will advise the Director of FDNR on resolving disputes over initial allocations, until July 1, 1994.

- o Up to 50,000 certificates may be issued to resolve disputes.

2. EEZ Program

Proposed Alternative: Require that all persons fishing commercially with traps in the EEZ off Florida[5] identify each trap with a trap tag issued under the State trap certificate program. Such persons would be exempted from the requirement for a vessel permit under the FMP, when Florida implements the restricted species endorsement to the lobster license. The FMP tailing permit would continue to apply.

Discussion/Rationale: The proposed alternative will, to a large degree, attain FMP objectives 1, 2, 3, and 5 (see Section 3B). The entire commercial fishery for spiny lobster in which traps are utilized is located off several coastal counties in south Florida, with 93 percent of landings in 1989-1990 occurring in Monroe County (Florida Keys). The fishery occurs in both the EEZ and State waters. No commercial fishery has existed off other states for spiny lobster; however, slipper lobster are occasionally harvested off other areas by trawls and sold. The spiny lobster trap certificate program applies to all resident and nonresident fishermen who hold Florida saltwater products licenses and have a current trap number (and color code). The fishery is essentially a day fishery (vessel returning to port each day); therefore, persons in the

[5]EEZ to its seaward limit beginning in the Atlantic Ocean south of 30° 42' 45.6" N. latitude at the Georgia/Florida state boundary and circumventing the Florida peninsula into the Gulf of Mexico with its western terminus delineated by 87° 31' 06" W. longitude at the Alabama/Florida state boundary.

fishery, whether they be residents or non residents, live in and operate from Florida and are subject to the licensing, landing and other spiny lobster rules of Florida. Each year a greater portion of the catch is landed and shipped to markets alive, necessitating local shore-based holding and handling facilities.

Since the State spiny lobster trap certificate program will apply to all fishermen living in and landing lobster in Florida and not to fishermen residing in and operating from other states the Regional Director has determined that the applicability of this rule is only to the EEZ off Florida. Otherwise, the program would apply to the EEZ from North Carolina to Texas, necessitating citizens of these states to participate in the Florida program or through the NMFS in a duplicate regional program.

The Florida trap certificate program is not a limited entry program. It is an effort reduction program designed to reduce the number of traps, which will over time increase total yield from the fishery by reducing confinement and other fishery induced mortality on juveniles (see discussion in Amendment 2), as well as making the industry more economically efficient. Persons utilizing commercial harvesting methods other than traps (largely by diving) may continue to enter the fishery, and any person may enter the fishery and utilize traps by purchasing certificates from those persons receiving the initial allocation of certificates. All such holdings of certificates would, however, be subject to an annual reduction, not to exceed 10 percent, as specified by the FMFC until such time as the optimum number of traps (estimated to range between 172,000 and 375,000) are deployed in the fishery.

Because of the limited scope and localized nature of the fishery and fishing grounds all commercial trap fishermen in the fishery are currently subject to Florida rules; therefore, no impact is anticipated on out-of-state fishermen by limiting the program to the EEZ off Florida.

The long-term impact of the program will be beneficial to the industry, principally in two ways. First, the catch per trap and thereby industry efficiency will be increased. Catch per trap was approximately 30 pounds in 1972-1973 and 1973-1974 seasons (with 200,000 traps in the west coast fishery) versus 8.6 pounds in 1989-1990 with 627,000 traps (Harper, 1991). Concurrently, the catch per fisherman is expected to increase as marginal fishermen leave the fishery, and this will increase net revenues to the remaining fishermen.

The second industry benefit is anticipated to occur is through reduction of mortality on sublegal or undersize lobster which will increase overall yield from the fishery (see discussion in Amendment 2 -page 19). Live undersize lobster are returned to traps because they result in catches greater than for other baits and two to three times greater than traps with no bait (FMFC, 1987; Heatwolfe, et. al., 1987). This practice resulted in fishery induced mortality of undersize lobster from exposure, handling and prolonged confinement in traps estimated to be 47 percent of animals used (Amendment 1 - 6.3.1). The requirement for live wells for holding these undersize lobster on board a vessel implemented by Amendment 2 was estimated to reduce this mortality by about one-half. The reduction in the number of traps deployed (and baited with live undersize lobster) would further reduce this mortality by 50 percent or more,

creating greater yield of legal size lobster. Adopting the State system as part of the FMP eliminates the creation of a duplicate system at the federal level to administer trap certificate transfers and trap tag issuance for the EEZ. This results in considerable savings in federal costs that would be associated with administering such a system. The exemption of trap fishermen fishing the EEZ off Florida from the requirement for the FMP vessel permit in August 1, 1993, when the restricted species endorsement applies to the state crawfish (lobster) license will alleviate the public from the burden of applying for such federal permits. Persons fishing the tagged traps will be identified by the State color codes and trap numbers required on vessels, buoys and traps. Other fishermen fishing commercially in the Florida EEZ or EEZ off other states would continue to be subject to the permit requirement to identify them for data collection purposes.

Rejected Alternative: **Status quo. Do not extend the program into the EEZ.**

Discussion/Rationale: The consequence of retaining the status quo is that the objective of the industry, Councils and State to reduce excessive effort in the fishery could be circumvented by deployment of traps in the EEZ, since the FMP does not currently address trap reduction. Limiting the EEZ program to the area off Florida alleviates the necessity of trap fishermen residing in other states to participate in the Florida program. Although there is little likelihood of a commercial trap fishery developing off these states, spiny lobster do occur in the EEZ off the other states in much more limited abundance.

B. UNDERSIZE LOBSTERS AS ATTRACTANTS

Currently, the FMP allows fishermen to hold up to 100 undersize lobster in a live well aboard a vessel while in the EEZ to use as attractants in baiting traps. Rules of Florida allow holding only 50 undersize lobster unless the vessel has more than 50 traps aboard, then they may possess up to one per trap.

Proposed Alternative: **Revise the FMP measure to conform to that of Florida.**

Discussion/Rationale: The proposed alternative will contribute toward achieving FMP objectives 1 and 2 (see Section 3B). In the normal fishing process each trap is hauled, contents removed and replaced overboard with one or more undersize lobster inside. Excess undersize lobster captured are held in the live well and distributed among empty traps as they are replaced overboard. The State and federal rules limit the aggregate amount of undersize lobster that may be held on board at one time. These rules were implemented to limit the number that: (1) must be kept alive in the live well and, (2) could be possessed aboard to reduce opportunity for landing sublegal lobster. The State limit of 50 seems adequate for the normal fishing process. The State rule also allows for possession of more than 50 (i.e., one per trap) if the fisherman is in the process of moving the trapline to another location.

The proposed alternative would adversely impact fishermen fishing long traplines (several hundred) if the undersize lobster are in clumped distribution in the catch and he is unable

to possess on board enough to bait all traps, thereby decreasing future catches of legal size lobster. If the undersize lobster in the catch are fairly evenly distributed this impact is unlikely to occur. The current FMP rule make enforcement of the State rule most difficult. The reduced possession level of the State rule enhances enforcement of prohibitions on landing (and selling) undersize lobster which has been a problem in the fishery.

Rejected Alternative: **Status quo - no change.**

Discussion/Rationale: The use of undersize lobster results in mortality that reduces the overall yield from the fishery. Lyons (1987) indicated live wells eliminated most exposure mortality and reduced seasonal mortality by 37 to 49 percent. However, he indicated that 28.5 percent of the undersize lobster would still die from confinement mortality during the season. He also indicated that mortality of confined lobsters with five per trap was 55 percent higher than for three to a trap. The status quo of allowing 100 lobsters aboard vessels increases the mortality over that of the proposed alternative.

C. ALLOWABLE HARVESTING GEAR

Currently, the FMP prohibits only the use of spears, hooks or similar devices that puncture the lobster's shell. FMFC has by rule established the only allowable gear for commercial harvest as diving, bully nets, hoop nets, or traps. Trawls are prohibited for direct harvest but incidental harvest is allowed provided the whole weight of lobsters on board does not exceed five percent of the weight of all species harvested.

Proposed Alternative: **Revise this FMP to conform with the Florida rule specifying allowable gear in the spiny lobster commercial fishery in the EEZ off Florida, except that 3x2x2 foot wire-frame traps with a wooden top may be used in the EEZ.**

Discussion/Rationale: The proposed alternative was selected because the gear allowed by the FMFC was selected to reduce catching and handling mortality associated with harvesting and measuring the lobsters and because it enhanced enforcement to have compatible regulations for State and EEZ waters. It will contribute toward achieving FMP objectives 2 and 3 (see Section 3B). It is more effective from a regulatory standpoint to specify allowable gear than to continually add prohibited gear. The only exception to requiring allowable gear as specified by the Florida rule is that wire-frame traps (3x2x2 foot or equivalent volume) with a degradable wooden top with top entrance funnel may be utilized in the EEZ. This type of trap is currently used in the deeper waters of the EEZ because the wire-frame creates less resistance to the faster water currents at those depths. Therefore, the wire traps are not moved by the currents as are traps constructed of wooden slats.

Traps are the principal gear utilized in the commercial fishery accounting for more than 85 percent of the landings (O'Hop, 1992, Per. Comm.). Diving accounts for most of the remainder. Divers utilize nooses, dip nets, mops, and other hand-held gear that do not puncture or pierce the shell. Bully nets (long-handled dip net with netted-hoop

perpendicular to handle) and hoop nets are used by fishermen in small boats usually at night with lights to capture lobster.

Shrimp trawlers occasionally catch spiny lobster as incidental bycatch. In the past trawlers occasionally targeted schools of lobster in their migrations across the bottoms. That practice would be prohibited, while incidental bycatch not to exceed five percent of total catch of all species on board would be allowed.

Rejected Alternative: **Status quo - no action.**

Discussion/Rationale: The status quo would impact Florida's ability to enforce its gear rules and would allow gear that results in unnecessary mortality, which could be prevented.

D. NIGHT DIVING POSSESSION LIMIT

Proposed Alternative: **Limit the possession of spiny lobsters taken by divers at night from the EEZ off Florida to the bag limit.**

Discussion/Rationale: There is a great deal of concern among trap fishermen in South Florida that part of commercial landings taken by divers at night may be from their traps. Trap fishermen are required to operate only in the daylight hours. Some recreational divers do spear fish at night and occasionally take lobsters. The trap reduction program will increase catch per trap and may therefore stimulate trap poaching by divers.The proposed alternative would limit all divers fishing at night to the bag limit of six lobsters per person to address that problem and contribute toward achieving FMP objectives 3 (see Section 3B). That limitation would apply only to the EEZ off Florida, as traps are generally not fished in other areas.

Rejected Alternative: **Status quo - no action.**

Discussion/Rationale: This alternative was rejected because it would not address the problem or perceived problem of theft from traps. Since commercial trap fishermen are limited to fishing during daylight hours it seemed equitable to apply that restriction to commercial divers. Trap poaching by divers is likely to increase as catch per trap increases following implementation of the trap reduction program.

E. MEASUREMENT OF LOBSTERS BY DIVERS

Proposed Alternative: **Require that spiny lobster harvested by divers in EEZ waters be measured while still in the water.**

Discussion/Rationale: The proposed alternative would require measurement of the lobsters for legal size by not removing them from the water for measurement and thereby contribute toward achieving FMP objectives 1 and 2 (see Section 3B). Frequently divers harvest the lobsters and deposit them into the boat and measure them after boarding the

boat. The State has prohibited this practice in its jurisdiction, because the lobsters are subject to a greater degree of mortality from handling and exposure. Since divers take lobsters individually (i.e., one at a time) this should not create a hardship related to compliance with the proposed alternative. It would certainly improve the survival rate of undersize lobster. Considering that the recreational divers take 403,000 legal size lobster during the special two-day season and 1,188,000 lobster during the first month of the season (i.e., 1.7 million pounds) (Bertelsen and Hunt, 1991), several million undersize lobster are likely handled and measured each year. Therefore, if improperly handled a very significant mortality in terms of numbers of lobster would occur as a result.

Rejected Alternative: **Status quo - no action.**

Discussion/Rationale: The status quo would continue the potential for significant mortality of undersize lobster from handling and exposure. It would also make it most difficult for Florida to enforce its rule.

F. UNIFORM TRAP AND BUOY NUMBERS

Currently, the FMP requires the numbers to be at least three inches in height, while State rules require the numbers to be at least two inches in height.

Proposed Alternative: **Require trap and buoy numbers to be at least two inches in height.**

Discussion/Rationale: The State implemented its requirement at the request of the industry who found it advantageous to use smaller buoys in certain areas. The smaller buoys have insufficient space to display numbers of three-inch height. The proposed alternative would contribute to achieving FMP objective 5 (see Section 3B).

Rejected Alternative: **Status quo - no action.**

Discussion/Rationale: Since many fishermen fish both State and federal waters, status quo creates a significant problem for them in trying to comply with the rules, especially as the smaller buoys are both more effective and cheaper.

5. REGULATORY IMPACT REVIEW (RIR)

5.1. Introduction

The Executive Order 12291 (E.O. 12291) 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 to enhance the public welfare in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed regulations are "major" under criteria provided in E.O. 12291 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 that the proposed alternatives for the amendment would have on the directed commercial spiny lobster fishery.

Ideally, the expected net present values of the yield streams over time associated with the different alternatives would be compared in evaluating impacts. Unfortunately, estimates of the yield streams and their associated probabilities are not available for most of the proposed measures. Nevertheless, the changes which are expected to result from this action are quantified to the extent possible. In cases where quantification is not feasible, a qualitative approach is undertaken with the intent of determining at least the direction of the expected effects.

5.2. Problems and Objectives

The problems and objectives are described in previous sections as part of the RIR by reference. In those instances where expanded discussion of the problems and/or objectives is required in the context of the various management measures, the expanded language is included in the appropriate "Regulatory Analysis" section in the balance of the RIR.

5.3. Salient Features of the Fishery

The spiny lobster fishery is mostly in Florida jurisdictional waters and in the EEZ off Florida waters under the management jurisdiction of the Gulf of Mexico and South Atlantic Fishery Management Councils. A majority of the harvest is caught in EEZ waters off south Florida, predominately off Monroe County. In the state of Florida, the commercial spiny lobster fishery ranks second only to pink shrimp in value. In the southeastern U.S., the spiny lobster fishery accounted for about 3.24 percent of the ex-vessel value of shellfish landed or 2.24 percent of the ex-vessel value of all species landed in 1989 (NOAA-NMFS, 1990).

The commercial fishing season normally starts the first week of August and ends by March 31st the following year. The lowest landing of 2.8 million pounds (MP) was recorded in 1960 while the highest landing of 11.9 MP occurred in 1972 but included lobsters landed from Bahamian waters. In the 1980's, landings fluctuated without observable trend. Landings ranged from a low of 4.5 MP in 1983 to a high of 7.8 MP in 1989, and averaged at around 6.0 MP for the 1980-1989 period. A greater portion of the harvest is landed in the west coast of Florida predominately in Monroe County. The corresponding nominal ex-vessel values were $11.2 million for 1983 and $23 million for 1989. Inflation has not been a major factor in the 1980's, and thus real and nominal revenues did not differ substantially (Waters, 1989).

Lobsters are harvested primarily by traps and to a lesser degree by bully nets. Divers also harvest lobster and are prohibited from using gear types that pierce the shell. The exact number of traps is not currently known but available estimates establish the number to range

from 650,000 to 850,000 (FMFC,1991f). NFMS data shows that the number of traps used in the fishery increased substantially from about 74,000 in 1960 to a peak of 675,000 in 1984. Preliminary estimates put the number of traps at about 660,000 traps for the 1989-1990 season (Harper, 1991). On the other hand, Muller (1990) estimated the number of traps to be about 850,000. Through November 1991, more than 1.3 million trap tags were issued by Florida DNR. Such relatively high demand for trap tags can come from a variety of reasons including fears of the need for in-season replacement of lost tags and the idea that a 15-cent tag might give fishermen some sort of vesting advantage in the certificate program (Palmer, 1992). The number of full-time commercial vessels rose from 221 in 1960 to a peak of 823 in 1975. Since then vessel number declined and was enumerated to be 465 in 1989; however, 711 vessel permits were issued to fish the EEZ in the 1991-1992 commercial fishing season although some permits were for divers (193) and trawls (76). Harper (1991) calculated that traps per vessel rose dramatically from 1973 through 1981, but leveled off at about 1,067 in the 1980-1988 period. In 1989, the average traps per vessel were 1,368. It is worth noting that traps per vessel would be higher if the Muller trap estimate were used instead.

Productivity in terms of pounds landed per trap per year has remained relatively stable during the 1980's whereas pounds per craft has increased slightly due to an increase in the number of traps fished per craft. In 1988, fishermen averaged approximately 11 pounds per trap and 13,200 pounds per craft. Revenues per trap and per craft were exceptionally high in 1987 due to high ex-vessel prices. Although prices fell in 1988, revenues per trap and per craft remained well above their levels for the 1980-1986 period. In 1988, fishermen averaged $32 per trap and $36,900 per craft. After accounting for inflation, revenue per trap in 1988 was the second highest since 1979. Real revenue per craft was the second highest since 1974 (Waters, 1989). Again, it may be noted that the numbers would change if the Muller trap estimate were used. In fact, catch per trap declined during the 1980's when using this latter trap estimate.

Direct users of the resource are concentrated in south Florida. The actual number of commercial participants in the fishery is estimated to be about 1,300 persons (O'Hop). A survey of the Monroe county harvesting sector done in 1986 indicated that the average number of fishermen per craft was 1.7. If directly applied on the number of crafts in 1989 of 465, the number of fishermen directly involved in harvesting would be about 790 individuals. The survey, however, was based on the 1985 number of Saltwater Product Licenses issued totalling 3,647. In 1991, about 4,134 SPLs with crawfish endorsement were issued. The vast majority of license holders reside in Monroe county and the Miami area. Together these two areas account for as much as 75 percent of all such license holders and more than 75 percent of total Florida spiny lobster landings (Johnson, 1987).

The fishery has a relatively large recreational component. Some of these fishermen also hold SPLs with crawfish endorsement. The sector is estimated to account for as much as 41 percent of total landings for the first month of the regular 1991-1992 spiny lobster fishing season and corresponds to about 29 percent of the 1990-1991 total commercial harvest (Bertelsen and Hunt, 1991).

5.4. Analysis of Impacts of Management Measures

The various management measures considered under this amendment are enumerated and discussed in the previous sections. A summary of all measures considered is presented in Table 1.

The general tenor of the measures proposed under this amendment is to make the federal rules governing harvest of spiny lobsters in the EEZ waters off Florida consistent with similar rules adopted by the state of Florida. A major component of the proposed measures is the adoption of the trap certificate reduction program recently instituted by the state of Florida for its spiny lobster industry. The status quo is the rejected alternative corresponding to each of the proposed management measures.

5.4.1. Impacts of Trap Certificate Program[6]

The basic features of the Florida trap certificate program have been described in Section 5-A of this document. When this program was being considered by Florida, an economic and small business impact statement was prepared to describe the likely impacts of the program (FMFC, 1991f). Since the proposed EEZ program would apply mainly to fishing activities in the EEZ off Florida, much of the cited impact statement has direct relevance on the subject. Although the more appropriate scope of this RIR is the incremental impacts of extending the Florida trap certificate program to the EEZ, the nature of the fishery and the location of the affected fishing industry call for the total impact determination of both the Florida program and its extension into the federal waters.

The spiny lobster trap certificate program is an effort limitation program whereby the number of traps to be deployed in the fishery would be reduced by a maximum of 10 percent annually from the 700,000 traps determined to be in the fishery by statute. Through appeals which extend until July 1, 1994 the total number of traps can be as high as 750,000. The reduction is applied across the board and would proportionately affect all holders of trap certificates. Starting in the 1993/1994 fishing season traps will be reduced by 10 percent. The exact number of traps is not currently known but available estimates establish the number to range from 557,000 to 1,484,000 in the 1988-1989 season. The best estimate records the total number of traps at 850,000 (Palmer, 1992). As described in Section 5-A of the amendment document, a catch per trap coefficient is calculated by dividing the sum total of each fisherman's highest catch for one of 3 years ending June 30, 1991 by 700,000. Each fisherman is subsequently allocated a definite number of trap certificates covering the same number of traps by dividing his highest catch for the subject 3-year period by the catch/trap coefficient. Trap certificates are transferable, subject to certain conditions outlined above.

As adopted by the state of Florida, the objectives of the trap certificate program are to reduce the number of traps used in the fishery to the lowest amount that will maintain or increase overall catch levels, promote economic efficiency in the fishery, and conserve natural resources. The Florida Marine Fisheries Commission shall set an overall trap reduction goal based on maintaining or maximizing sustained harvest from the spiny lobster fishery (FMFC,

[6]The major reference for this section is the FMFC's Economic and Small Business Impact Statement for the Proposed Amendments to Rule 46-24, F.A.C. (Spiny Lobster and Slipper Lobster), December 1991.

1991f). When extended to federal waters, the same overall goal and objectives would be adopted as there is no apparent inconsistency with FMP objectives as outlined above. It may be noted that maintaining or maximizing sustained harvest from the spiny lobster fishery may not be consistent necessarily with the promotion of economic efficiency in the fishery. There are various estimates for the "optimum" number of traps. Lyons (1989) estimated the optimum number to range from 195,000 to 250,000 traps. The commercial industry has argued for 375,000 traps (FMFC, 1991f). The exact number has not been decided yet. The trap reduction program will be monitored annually by Florida, which will decide on the target number of traps by assessing the status of the fishery annually.

Table 2 (second column) depicts the trap reduction schedule assuming 750,000 as the base number of traps and a straight line reduction technique of 10 percent per year. To date the inclusion of the recreational sector in the trap reduction program has not been decided. As earlier discussed the total number of traps commercially deployed in the spiny lobster fishery could range from 650,000 to 850,000. For the purpose of this RIR the total number of traps at the start of the trap certificate program, i.e., 1992-1993 season, is taken to equal 750,000. This is equal to the 700,000 figure used to determine the catch per trap coefficient plus the 50,000 that may be distributed if initial trap certificate assignments are successfully contested.[7] In Table 2, the policy period considered starts with the 1992-1993 season and ends at the close of the 2002-2003 season. Reduction of traps was scheduled to begin in the 1993-1994 fishing season. Starting with 750,000 traps in the 1992-1993 fishing season, the total traps remaining at the end of the reduction period will be 265,100. There is no intent here to consider this number as the target "optimum" number of traps. The reduction in fact can occur indefinitely so long as yield does not decline.

From the standpoint of the industry, the beneficial effects of the program come from a potential increase in the pounds of harvest primarily due to shorts (undersize lobsters) mortality reduction and improvement in overall efficiency of the industry. The mortality from the use of shorts in traps has been estimated to be relatively high (Amendment 2). By reducing traps, some of the shorts that would have died could mature and be recruited to the fishery, increasing the number of larger size lobster. Moreover, the reduction in traps does not entail reduction in harvest. Instead it implies that harvest will be distributed over the fishing season. Thus, some of the smaller size lobster now harvested in the beginning of the season will be allowed to grow bigger, again resulting in a relatively greater number of larger size lobster available later in the season. The increase in yield due to more and bigger size lobster may be expected to bring in higher ex-vessel revenues. This contention, of course, presupposes that the ex-vessel demand for spiny lobsters is not price flexible. It has been argued that the Florida spiny lobster fishery is a price taker, with the ex-vessel prices

[7]The percent reduction in the number of traps for the first year of program is actually a little different from the one depicted in Table 2. By statute the base number of traps is 700,000 with additional 50,000 which may be distributed under the appeals process. This is the number allocated based on the 1989-1990 through 1991-1992 commercial fishing seasons Recent action of the Florida legislature allows virtually unlimited (industry-wide) number of traps to be fished in the 1992-1993 season. In addition there are certain complications associated with the initial allocation of trap certificates which could delay the reduction program. At any rate, once the trap reduction commences, the 10 percent would be applied on the allocated number of traps and not on the actual number of traps deployed in the year prior to trap reduction. For example, if as depicted in Table 2, the total number of trap certificates allocated total 750,000 and the trap reduction starts in the 1993-1994 fishing season, only 675,000 (90 percent of 750,000) traps would be allowed in the 1993-1994 season. If on the other hand, the actual number of traps fished in 1992-1993 is 850,000, the actual reduction in traps in 1993-1994 will be greater than 10 percent.

determined by the relatively large quantities of imports and inventories (Waters, 1989). To some extent, this condition indicates demand inflexibility. Although not totally applicable, it may be mentioned here that the demand for American lobsters (*Homarus americanus*) was determined to be price inflexible in both the wholesale and ex-vessel markets (Wang and Kellogg, 1988). The demand for spiny lobster has not been recently estimated, and previous studies on the optimum fleet size and optimum number of traps in the fishery assumed fixed price (Williams and Prochaska, 1977; Prochaska and Cato, 1980; Keithly, 1981). Even under a fixed price assumption (i.e., zero price flexibility), ex-vessel revenues can still increase with an increase in total pounds landed. There is some uncertainty as to whether a change in the size distribution of spiny lobsters weighted more towards larger size lobsters would translate to higher price per lobster, and subsequently into higher revenues. There is a possibility that certain size category of lobster could be more valuable than others. But whether such condition is sufficient for higher price per pound when more larger sized lobsters are available cannot be validated without further information on the price structure of spiny lobsters. The cited study on American lobsters investigated the responsiveness of prices to an increase in regulated minimum size. One major finding of the study was that such increase in minimum size would result in an increase in wholesale price via a change in size distribution of total supply for lobsters, and part of the increase in wholesale price is transmitted to the ex-vessel sector. The applicability of this finding on the spiny lobster fishery cannot be ascertained.

Table 2 presents projected landings and dollar values under the status quo and trap reduction alternative. Landings under the status quo are assumed constant throughout the policy period based on the average landings for the 1987-1988 through 1989-1990 fishing seasons. Landings under the trap reduction alternative are the same as those of the status quo with adjustments for reduction in mortality of shorts resulting from confinement in traps. The major assumption here is that 3 undersize lobsters per trap per year would be saved and would be later landed as legal catch. The conversion rate assumed is one pound per lobster (See FMFC, December 1991 for further discussion of these assumptions). Dollar values are generated by applying a constant price of $3 and $5 per pound. Average ex-vessel price per pound (nominal) for lobster remained relatively stable at about $2.40 during the first half of the 1980's, rose to $3.61 in 1987, and fell down to $2.80 in 1988 (Waters, 1989). In more recent years, price per pound ranges from $3.00 to more than $5.00 (FMFC, 1991f). This latter price range is chosen for the present analysis. A constant price over the policy period with landings increasing may not be totally appropriate as discussed in the preceding paragraph. To the extent that spiny lobster ex-vessel demand is price inflexible, the tabulated changes in revenues tend to overestimate the impacts. It may be noted that the tabulated impacts do not incorporate the possibility that price per lobster would increase with a change in size distribution of catch. For the purpose of discounting future revenues, a 10 percent interest rate is used. As can be gathered from the table, the net impact of the trap reduction alternative over the entire period considered would amount to about $15 million or $25 million using price per pound of $3 and $5, respectively. The average annual increase in ex-vessel revenues due to the proposed alternative is about 14.5 percent.

The more important potential benefit to the industry from the trap certificate program is the possible increase in production efficiency. Effort in the fishery has been considered to be very high. A major component of this effort is the number of traps deployed and the trap reduction program could directly address this problem. Other components of effort, however, such as the number and capacity of fishing crafts are not restricted. It may be noted though that the

number of full-time trap fishing crafts in the fishery has declined from a peak of 823 in 1975. In the last 5 years fishing crafts stabilized at around 500 fishing an average of about 1,195 traps per craft (Harper, 1991). Restricting the number of traps would undoubtedly constrain the number of fishing crafts. However, it is not clear whether other components of effort directly related to fishing crafts such as the size, speed, and capacity of the fishing crafts or indirectly related to fishing crafts such as soak times and catch efficiency of traps could be constrained to a level that would ensure a highly efficient commercial fishery. Even with reduced traps, the derby nature of the fishery remains, and consequent dissipation of rent is still a strong possibility. It may be related here that a somewhat similar trap reduction program was instituted in the Australian rock lobster fishery. This program, established in 1985, provides for a reduction in the number of pots used in the fishery within 5 years, but the target reduction is only 10 percent of total pots used at the start of the program. Recent studies, showed that effort in the fishery has continued to increase due mainly to technological improvements such as bigger and faster boats, pot improvements and electronic fishing aids (Western Fisheries, 1991).

The trap certificate program is also expected to lessen the adverse effects on habitat caused by trap usage, although possibly not all traps used inflict such damage on the bottom habitat. Damage occurs from both the weighted trap itself and the buoy line becoming entangled in sea fans, other corals, grasses, etc. The potential reduction in habitat loss and corresponding values is shown in Table 3. The basic parameters assumed in the calculation are: a) 10 percent of total traps have deleterious effects on bottom habitat; b) each trap affects 24 square feet of bottom; c) the value of the habitat equals the dockside value of rubble rock (FMFC, 1991f). The assumption that only 10 percent of all traps inflict damage on bottom habitat is deemed to be conservative and sufficient for the current purpose of illustrating the potential benefits from the trap reduction program. By law traps used in the spiny lobster fishery have 6 square feet bottom surface area. Using this number as the same area damaged by each tenth trap which is assumed to be pulled 4 times per season results in 24 square feet of bottom habitat damaged by each tenth trap. Valuation of bottom habitat involves a relatively complex process, and information on this regard is non-existent. For the current purpose, the value of habitat is assumed to equal the dockside value of rubble rock with encrusting organism as was done in the valuation of habitat damage in the Mavro ship grounding. The dollar value per square foot is about $11. Over the period considered for trap reduction, reduction in habitat loss would total about 1.2 million square feet valued at $12.9 million or $8.6 million when discounted for future values. Naturally, there would be positive indirect effects on the spiny lobster and other fisheries from such habitat loss reduction. At least two qualifiers need mentioning at this juncture. The above calculation is more akin to average rather than marginal valuation. If at the start of the trap reduction program, good bottom habitat is scarce as may be reasonably assumed, using a constant dollar value per square foot of restored habitat tends to overestimate the impacts. Another important issue is whether the dockside value of rubble rock reflects the value of bottom habitat.

The foregoing benefits of the trap certificate program may not totally accrue to the commercial trap industry because of the presence of other users, particularly the recreational sector which has been estimated by Bertelsen and Hunt (1991) to account for about 41 percent of total harvest (1.3 million pounds) for the first month of the 1991-1992 regular fishing season. The trap certificate program then has the potential to change catch allocation in favor of the recreational sector or at least make more lobster available so recreational

fishermen fill their bag limits more rapidly. This re-allocation may arise not so much in terms of reductions in commercial landings but more in terms of reduction in percentage share of total catch since the trap reduction program is expected to result in higher potential catch. In addition, the estimated benefit from reduction in habitat loss due to the trap reduction program may not be realized if there is a compensating increase in traps used by the recreational sector. It may be noted that in conjunction with the trap reduction program, each recreational fisherman may acquire 3 non-transferable trap certificates that are not covered by the reduction schedule. Based on sales of lobster stamps for the 1990-1991 fishing season, the recreational fishery can be as much as 120,000 individuals although not all may be expected to actually fish for lobster (FMFC, 1991f). A survey conducted during the Special Sport Season and the first month of the regular fishing season revealed a relatively large proportion of stamp holders in the Keys (about 60 percent) actually fished for lobsters; lower proportions were found for the east coast (about 30 percent) and the Panhandle and west coasts of Florida (1 to 2 percent) (Bertelsen and Hunt, 1991). Although it cannot be readily inferred from such results as to how many of all lobster stamp holders actually fish, it may be conjectured that a relatively large percentage do fish for lobsters since a greater portion of stamp holders are located in the Keys. Even assuming (arbitrarily) only 40 percent of all stamp holders fish and qualify for the 3-trap certificates, we can expect no more than 144,000 traps would be deployed by the recreational sector. However, most recreational fishermen are likely to harvest lobsters by diving. This number could present some problems in realizing the mentioned benefits of the trap reduction program. It may be noted, however, that the Florida statute on the trap reduction program stipulates that the 3-trap certificate proviso may be amended if it is determined to be detrimental to the goals and effectiveness of the overall trap reduction program.

The trap certificate program will affect all holders of SPLs (currently estimated to be 4,134) who fish traps. About 2,391 individuals and 90 business entities will obtain traps based on reported landings. Businesses have to assign traps to individuals. The remaining 1,653 will be allotted a minimum of 10 traps each. Through appeals additional trap certificates not exceeding 50,000 could be distributed to any of 2,391 individuals and 90 businesses. The trap certificate program would proportionately reduce individual holdings of traps but may disproportionately impact fishing operations. Operators fishing the minimum amount of traps to break even would be compelled to purchase additional traps or incur operating losses and sell their remaining traps once trap holdings are reduced. Those currently fishing the optimum number of traps from the standpoint of their individual fishing operations would also be adversely impacted in the short run by the program. These individuals may have to adjust by buying certificates or by modifying other aspects of their fishing operations. The adverse impacts on the latter group would be relatively less than on the former. The latter group has the option to buy certificates, but has to consider the net effect on operational profitability of employing additional traps some of which would be removed from actual use in succeeding years until the reduction schedule is terminated. The adverse impacts on suppliers of traps and trap materials would arise more from the reduced demand for traps than from a potential increase in the inventory of traps since traps usually last only two years.

Although spiny lobster demand at various market levels has not been estimated empirically, it is perhaps reasonable to expect lobster price at the ex-vessel and consumer levels to be minimally affected by the trap certificate program. Overall landings would gradually increase over time, but this is not expected to effect a relatively large reduction in prices. Annual

Florida landings comprise merely about 5 percent of total lobster supply in the U.S.; imports to a large degree and inventory are major sources of total lobster supply (Waters, 1989). It is likely that domestic landings of spiny lobsters command a relatively higher price in the fresh or live lobster product markets. It has been reported that recent price increases reflect the influence of local supply contracts with cruise ships and new market channels for live lobster air shipped from Ft. Lauderdale to Japan (FMFC, 1991f). Increases in price due to opening of new markets or innovative marketing could trigger an increase in effort in the fishery. The trap reduction program could act as a constraint to such induced increase in effort coming from those not participating in the fishery at that time, but might not effectively constrain those in the fishery to increase effort by some other means than an increase in total number of traps deployed.

Information on the socio-cultural aspects of the fishery was collected in 1986 via a survey of the fishery participants, and a lengthy report of the survey results was prepared (Johnson, 1987). A great majority of spiny lobster fishermen (75 percent) resided in the Monroe County and Miami area . The Monroe County accounted for 42 percent of license holders and 75 percent of spiny lobster landings. About 18 percent of the fishermen were Hispanics and mainly reside in the Keys and Miami areas. The impacts then of the trap certificate program would fall mostly on these fishermen residing in these areas. The impacts, however, would not be uniform as fishermen in these and other areas range from being full-time commercial to recreational fishermen. In Monroe County about 42 percent and 15 percent were full-time and part-time commercial fishermen, respectively, and 15 percent were recreational fishermen. The rest of license holders could not be assigned to any of these three major categories (e.g., retirees, deceased individuals, collectors of marine specimens, etc.). In the Miami area, about 63 percent were recreational fishermen, 25 percent were part-time commercial fishermen and 13 percent were full-time fishermen. There was a large percentage of non-response to survey questions in this area. In more recent years, the distribution of license holders may have changed particularly in response to regulations and market conditions for spiny lobster, but no information can be presented to verify such change. From the depicted distribution, the impacts of the trap certificate program would fall more on full-time commercial fishermen in Monroe County and recreational fishermen in the Miami area. Part-time commercial fishermen may be allotted trap certificates based on historical landings or 10 traps, whichever is higher. These traps are also affected by the reduction program. Recreational fishermen could qualify for the limit of 3 non-transferable traps which would be not be covered by the reduction program.

The success of the trap certificate program hinges crucially on its effective enforcement. Reduced number of trap certificates does not necessarily translate to reduced number of traps in the water. Enforcement of the program is further complicated by the 3-trap certificate proviso for the recreational sector. To the extent, however, that state and federal rules on lobster are coordinated, enforcement may not be as complicated as when maintaining the status quo for the EEZ while the trap certificate program is implemented in state waters.

Adoption of the program in the EEZ results in waiving of the general vessel permit requirement for trap fishing in the EEZ, beginning with the 1993-1994 season. For the season ending March 31, 1992, NMFS issued commercial spiny lobster permit to owners of 711 vessels of which 563 used traps, 193 used SCUBA or diving gear, and 76 used shrimp trawls. Many permittees used more than one gear type (Justen, 1992). Divers still need to obtain federal

federal permit while shrimp trawls will be prohibited from directly harvesting lobster and thus be subject to the general requirement that lobster bycatch cannot exceed 5 percent of total other (than lobster) catches on board the vessel (see Section 5.4.3 below for discussion on allowable harvest gear types). In addition, tailing permits will still have to be issued by NMFS to enable long trapping trips to separate the carapace for the purpose of maintaining good market quality for caught lobsters. Overall about 400 federal permits may be waived in the 1993-1994 season due to the certificate program. This waiver means an annual cost saving of $36.50 per permit. One major implication of such waiver is that the federal government may no longer have the effective means of sanctioning violators of federal fishery regulations. Violations, including non-payment of fines, would be mainly left to the state for corrective actions.

5.4.2. Undersize Lobsters as Attractants

The proposed alternative is to reduce from 100 to 50 the number of undersize lobsters to be held in a live well aboard a vessel while in the EEZ for use as attractants in baiting traps. The limit may be exceeded if there are more than 50 traps aboard for which one undersize lobster per trap may be allowed. Undoubtedly this proposal would enhance the effectiveness of the Florida rule on the matter.

The proposed rule is likely to adversely impact those fishing in the EEZ but not those fishing mainly in Florida waters. The adverse impact, however, would be mainly limited to those fishing several hundred traps at a time. It may be noted that the use of attractants has increased the catch efficiency of traps over no bait by as much as threefold when using 3 lobsters as baits (Heatwolfe, 1987). Coupled with a reduction in the number of traps, these operations would bear the major burden of the proposed regulations. The reduction, however, may be expected to benefit the industry in the long-run as the proposed rules provide for both biological and economic gains. The proposed federal rule may be expected to cut down mortality of undersize lobsters stemming from illegal harvest or from confinement mortality related to their use as baits in traps. These two sources of mortality were estimated to account for a loss in potential yield from the fishery of 63 to 83 percent. Significant reduction in such mortality must have been achieved by the requirement to use live wells in both Florida and federal waters, the 100 lobster limit in the EEZ, and the 50 lobster limit in Florida. The proposed rule would further reduce undersize mortality, allowing larger harvest later in the season. Larger harvest in terms of poundage and size would translate to higher ex-vessel revenues. Although for some fishing operations, such higher ex-vessel revenues may not totally offset the loss in the catch efficiency of traps, the industry as a whole would likely profit from the rule. As typical in many open-access fishery, there is usually the absence of a direct linkage between costs and benefits from a regulation to a specific harvesting operation. While some segments of the fishery incur the cost of regulations, others may derive the benefits therefrom.

5.4.3. Allowable Harvesting Gear

Under current rules, the only gear prohibited in the harvest of spiny lobster in the EEZ are spears, hooks and similar devices that puncture the lobster's shell. The proposed alternative

is to adopt the Florida rules on allowable gear types for commercial harvest: traps, diving provided the gear used do not puncture the lobster's shell, bully nets, and hoop nets. This alternative tends to enhance the enforcement of Florida rules as well as the enforcement of the trap certificate program. Traps are by far the main gear used in the fishery, accounting for more than 85 percent of landings. Traps in Florida are also subject to certain structural designs. The proposed alternative for the EEZ carries similar requirements on the structure of traps used to harvest spiny lobsters. The proposed alternative frees up the administrative agencies from implementing rules to restrict adverse harvesting gear that may be employed either in reaction to management regulations or efficiency of the gear.

Considering these rules already affect fishermen in Florida waters and that most of the gear types currently used in the lobster fishery would be allowed, the proposed alternative does not have substantial direct impacts on industry participants. It must be recognized, however, that about 76 EEZ commercial fishing holders using trawls would be adversely impacted by the measure. The extent of this impact is probably relatively small considering that lobsters are mainly bycatch in most trawling operations. Although relatively remote, this alternative would prevent the introduction of innovative harvesting gear that could be more economically efficient or biologically more beneficial. Indeed, use or development of harvesting gear that is more ecologically destructive will also be prevented under this alternative.

5.4.4. Night Diving Possession Limit

Currently commercial diving at night in the EEZ is restricted only with respect to the harvesting gear that may be employed. The proposed alternative would further restrict night diving to the bag limit of 6 lobsters per person. This would make commercial diving at night very inefficient and possibly eliminate it entirely. The number of divers affected by this measure is unknown, but the adverse impact on them would be relatively substantial. If as alleged night divers take lobsters away from traps, this practice would still continue under the proposed alternative albeit at a lower level. Given the same level of enforcement, such activities would be extremely difficult to detect. However, the reduced possession limit could be enforced at dockside, reducing enforcement cost. Certain individual trappers may benefit from this measure, but it is very unlikely for the entire industry to gain much from it over the short run. When taken together with the trap certificate program, this prohibition on night divers could partially arrest an increase in effort from this segment of the fishery as the number of traps is gradually reduced.

5.4.5. Measurement of Lobsters by Divers

Currently for the EEZ, divers generally measure their catch when they are on board their boats. The proposed alternative would prohibit this practice and would require the measurement be done while the lobsters are in the water as presently stipulated under Florida rules. There are two major benefits from this measure: 1) reducing mortality of sublegal lobsters and 2) enhancing enforcement of the minimum size regulations. The recreational sector in particular harvest a large number of legal sized lobsters, and in the process would also be catching sublegal ones some of which would die from exposure and handling when measurement is done on board the boats. This reduction in undersize mortality could provide

larger catch and revenues for the commercial sector and would partly allow larger size catch for the recreational sector. This measure may be expected to adversely impact commercial divers more than recreational ones in terms of increasing their harvest costs, i.e., more time to measure the catch. The enhanced enforcement benefits stems from the fact that so long as sublegal lobsters are alive in the boat, a fisherman can always claim that he intends to release them later after the lobsters are measured. Previous testimony to the FMC by the Florida Marine Patrol cited this as a problem in enforcing the minimum size rules (Palmer, 1992).

5.4.6. Uniform Trap and Buoy Numbers

The proposed measure would require shorter minimum trap and buoy numbers from three to two inches in height to conform to Florida rule. Apparently smaller buoys do not hamper identification of traps being used in the area so that the proposed measure can be expected to carry no offsetting complicating problem for enforcement purposes. This measure is expected to benefit trap users who have found it more efficient to use smaller buoys in certain fishing areas.

5.5. Private and Public Costs of Management

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 specific action include:

Council costs of document preparation	$ 2,500
NMFS administrative costs of document preparation, meetings and review	$ 1,100
Public burden associated with permits	($ 14,600)
Federal costs associated with permits	$ none
TOTAL	($ 11,000)

The Council and NMFS costs of document preparation are based on staff time, printing and any other relevant items where funds were expended directly for this specific action. There is an some uncertainty with respect to the direction of change in the costs of law enforcement. A decrease in the cost of law enforcement may be expected from better coordination of state and federal rules on spiny lobster under the proposed set of regulations. However, the trap reduction program may require more enforcement than currently expended on the fishery to generate the expected benefits from such program. The net effect is not readily ascertainable. There will be some reduction in public burden associatad with the action because federal vessel permits for spiny lobster would be waived for trap users. Some federal permits, however, will be needed for commercial divers harvesting in the EEZ. The cost

saving to the public is based on about 400 of 711 federal permits that would be waived at a cost per permit of $34 plus a time cost of $2.50. No additional Federal costs associated with permits are expected. Although there is no cost saving to the federal government, NMFS can redirect part of its budget used to process applications to finance other needed activities.

5.6. Summary of Impacts and Determination of a Major Rule

Table 4 presents a summary of regulatory impacts. Notice that only the proposed measures are presented in the table. Since the only rejected measure under each management item is the status quo, any positive impacts due to the proposed alternative may be considered as foregone benefits under the status quo. Also any negative impact of the proposed alternative may be regarded as non-existent under the status quo.

Overall, the proposed set of management measures can be expected to result in benefits to the industry in particular and society at large. The trap certificate program is considered a significant improvement over the status quo. Since much of the program was developed by the industry, compliance is expected to be relatively high. Although it is not expected to totally control effort in the fishery and consequently enhance the efficiency of the industry, the trap certificate program contains features that address the major sources of inefficiencies in the fishery. Individual fishing operations would be adversely impacted by the program particularly during the trap reduction period, but the industry as a whole can be expected to benefit from the program. As calculated, the gain in ex-vessel revenues to the industry would range from $15.2 million to $25.3 million for the entire policy period. A reduction in habitat loss could also result from the trap certificate program, and it has been estimated to amount to $8.6 million for the entire policy period. The long-term viability of the spiny lobster stock and the fishery dependent on it is enhanced under the proposed trap certificate program. The reduction in allowable undersize lobster for use as baits is deemed to render inefficient fishing operations deploying hundreds of traps at one time. While these operations incur the cost of such regulation, the industry at large can gain from harvest of more and larger lobsters that usually command relatively higher price. The measure itemizing allowable harvesting gear is not expected to have any impacts in the short run. It is more of a device to prevent the use of other gear types that could render the trap certificate program less effective in reducing effort in the fishery. The provisions regarding night diving and lobster measurement would have relatively substantial negative impacts on commercial divers. The measure on uniform trap and buoy numbers is expected to have minimal positive impacts on the industry. The proposed set of regulations would incur an estimated positive cost of $3,600 consisting mostly of Council and NMFS costs of document preparation. The industry, however, is expected to save about $14,600, annually, beginning August 1, 1993, due to the exemption from federal vessel permits.

Pursuant to E.O. 12291, a regulation is considered a "major rule" 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; 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 ex-vessel value of the spiny lobster commercial fishery has been estimated to be about $23 million in 1989. The trap

reduction program which is a major component of this amendment is expected to generate increases in ex-vessel values of the commercial fishery. The annual effects as depicted in Table 2 shows that these annual increases in ex-vessel values would be substantially less than $100 million. The recreational sector may be expected to benefit from the proposed trap certificate program. Although valuation of this sector's benefits is not available, it is deemed that such effects would not exceed $100 million annually. Since the domestic spiny lobster fishery is largely a price taker, the proposed set of regulations is expected to minimally affect consumer price. The commercial sector may initially incur higher cost is fishing operation due to the trap reduction program since additional traps will have to bought from certificate holders; but over time as efficiency in the industry is improved, increases in fishing costs would be more than proportionately compensated by increases in revenues. Operating cost to commercial divers may increase as a result of the proposed measures on night diving and lobster measurement at sea. This cost cannot be estimated with available information. Costs to the federal government of implementing and administering the proposed set of regulations are not likely to increase. Coordination of state (Florida) and federal rules on spiny lobster may negate increases in enforcement costs. The trap certificate program in particular necessitate a start-up cost to be incurred by the state of Florida. Since the trap certificate program can also generate income to the state, such start-up cost would be more than compensated. Although the trap certificate program would eventually reduce participation in the commercial fishery, competition would not be impaired but instead rationalized by restricting effort to a level that can render the industry more efficient. As a corollary to this, investment in the fishery would also be rationalized by restricting the general incentives to overcapitalization of the fishery. Employment in the commercial fishery may decline over time to a level that the fishery can support. If the commercial fishery achieves the intended efficiency level, U.S. based enterprises would become more competitive in the lobster market which is currently dominated by imports. The provision on allowable harvesting gear would restrict innovation in the fishery. It may be noted, however, that some innovative techniques may be beneficial to the entire fishery while others may have deleterious impacts on the stock and habitat. In view of the foregoing discussion, it is concluded that this regulation, if enacted, would not constitute a "major rule" under any of the above-mentioned criteria.

6. INITIAL REGULATORY FLEXIBILITY ANALYSES

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. Since small businesses will be affected by the regulations to be promulgated under FMPs and plan amendments, this document also serves as the Initial Regulatory Flexibility Analysis (IRFA). 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.

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. The SBA defines a small business in the charter boat activity as a firm with receipts up to $3.5 million per year.

Determination of Significant Impact on a Substantial Number of Small Entities: In general, a regulation affecting more than 20 percent of subject small entities is construed to impact a "substantial number" of small entities (NMFS Guidelines on Regulatory Analyses of Fishery Management Actions, 1989). One of the criteria for a regulation to have a "significant impact" on small business entities that has direct relevance on the matter at hand is for a regulation to impact more than 5 percent of the industry's annual gross revenues. The proposed trap certificate program would directly affect all commercial trap users. It is estimated that there are 4,134 SPLs of which 2,391 individual holders and 90 businesses would obtain trap certificates based on reported landings, and the rest would each receive ten trap certificates. On this basis it is concluded that the proposed trap certificate program and *a fortiori* the set of all proposed measures are concluded to impact a substantial number of small entities. The trap certificate program has been calculated to result in an annual increase in ex-vessel revenues of about 14 percent. On this account, it is concluded that the set of all proposed measures would have a substantial impact on the fishery. Thus, it is concluded that the proposed regulation would have a significant impact on a substantial number of small entities, and an IRFA is thereby required. Considering that the significant impact discussed with respect to the trap certificate program is positive, only an abbreviated IRFA is included herein. An RIR was done to satisfy the requirements of E.O. 12291 and the results of that analysis apply for the purposes of the IRFA since all the firms involved are small business entities. Therefore, most of this IRFA will consist of references to the RIR. Other information required for the IRFA is contained either in other sections of this framework adjustment or in the FMP, as amended, and will be referenced as appropriate.

Explanation of Why the Action is Being Considered: Refer to Section 3-A of this document: Problems and Issues in the Fishery.

Objectives and Legal Basis for the Rule: Refer to Section 3-B, C, and D of this document: Management Objective and Optimum Yield in this amendment.

Identification of Alternatives: Refer to Section 4 of this document - Proposed Management Actions.

Cost Analysis: Refer to this document's Section 5.4 - Analysis of Impacts of Management Measures and Section 5.5 - Public and Private Costs of Management.

Competitive Effects Analysis: The industry is composed of small businesses, and therefore there are no disproportional small vs. large business effects.

Identification of Overlapping Regulations: The proposed set of regulations does not create overlapping regulations with any state regulations or other Federal laws. On the contrary, the proposed regulations are intended to achieve harmony with regulations in the state of Florida.

7. ENVIRONMENTAL ASSESSMENT

Physical Environment

The proposed actions will reduce impacts on the physical environment from unintentional setting of traps on coral. This will occur as numbers of traps are reduced through the trap certificate program. See Section 5.4 for further discussion of habitat effects.

Fishery Resource

The proposed actions will, in the long-term, increase the spawning potential and yield of the stock. Short-term impacts on the resource are not anticipated.

Human Environment

The proposed actions will benefit those persons who fish traps by increasing their catch per unit of effort and net profit over the long-term. Over the short-term marginal fishermen may be displaced but will be compensated for leaving the fishery.

Effect on Endangered Species and Marine Mammals

The proposed actions will effect a major reduction in traps reducing the potential for impacts on marine mammals or endangered and threatened species. Turtles have been reported to destroy traps and eat confined lobster. There has been concern expressed that a potential exists for turtles to become entangled in buoy lines, but no documentation exists of that problem. On March 6, 1992 a Section 7 Consultation was held. The conclusion was that neither the fishery nor the proposed actions were likely to jeopardize the continued existence of threatened or endangered sea turtles or marine mammals.

Effect on Wetlands

The proposed actions will have no effect on flood plains, wetlands, or rivers.

Mitigating Measures Related to the Proposed Action

No adverse environmental impacts are expected with the proposed actions, therefore, no mitigating actions are proposed.

Unavoidable Adverse Effects

There are no unavoidable adverse effects resulting from the proposed actions.

Irreversible and Irretrievable Commitments of Resources

There are no irreversible commitments of resources caused by implementation of these actions.

Finding of No Significant Environmental Impact

The proposed amendment is not a major action having significant impact on the quality of the marine or human environment of the Gulf of Mexico. The proposed actions create a greater degree of cost efficiency in the commercial spiny lobster industry and alleviate problems related to the mortality of undersize lobster which should increase yield from the fishery. The proposed actions should not result in impacts significantly different in context or intensity from those described in the Environmental Impact Statement of the FMP and Environmental Assessments published with the regulations implementing Amendments 1, 2, and 3.

Having reviewed the environmental assessment and available information relative to the proposed actions, I have determined that there will be no significant environmental impact resulting from the proposed actions. Accordingly, the preparation of a formal environmental impact statement on these issues is not required for this amendment by Section 102(2)(c) of the National Environmental Policy Act or its implementing regulations.

Approved:_____ _____
Assistant Administrator for Fisheries Date

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8. OTHER APPLICABLE LAW

Impacts on Other Fisheries

Data available to the Council indicate this amendment will have no initial impact on other fisheries. Over the long-term some trap fishermen displaced from the fishery may enter other fisheries.

Habitat Concerns

Habitats and related concerns were described in the FMP and Amendment 2.

Vessel Safety Considerations

There are no fishery conditions, management measures, or regulations contained in this amendment that would result in the loss of harvesting opportunity because of crew and vessel safety effects of adverse weather or ocean conditions. The Councils have concluded that none of the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions. Therefore, there are no procedures for making management adjustments in the amendment due to vessel safety problems because no person will be precluded from a fair or equitable harvesting opportunity by the management measures set forth.

Coastal Zone Consistency

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires that all federal activities which directly affect the coastal zone be consistent with approved State coastal zone management programs to the maximum extent practicable. The proposed changes in federal regulations governing spiny lobster in the EEZ of the Gulf of Mexico and South Atlantic will make no changes in federal regulations that are inconsistent with either existing or proposed state regulations.

This amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Georgia, Mississippi, North Carolina, and South Carolina to the maximum extent possible; Texas does not have an approved Coastal Zone Management program. This determination has been submitted to the responsible state agencies under Section 307 of the Coastal Zone Management Act.

Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to control paperwork requirements imposed on the public by the federal government. The authority to manage information collection and record keeping requirements is vested with the Director of the Office of Management and Budget. This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

The Councils propose, through this amendment, to establish no additional permit or data collection programs. The amendment does propose exempting trap fishermen from the permitting requirements of the FMP, beginning with the 1993-1994 fishing season. Therefore, the reporting burden on the public and cost to the government will be reduced through this amendment.

Federalism

No federalism issues have been identified relative to the actions proposed in this amendment and associated regulations. The affected states have been closely involved in developing the proposed management measures and the principal State officials responsible for fisheries management in their respective states have not expressed federalism related opposition to adoption of this amendment. Therefore, preparation of a federalism assessment under Executive Order 12612 is not necessary.

9.0 REFERENCES CITED AND SUBMITTED FOR THE RECORD

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Table 1

Description of Management Measures

Management Item		Proposed Measures	Rejected Measures
A.	Trap Certificate Program	Require that all persons fishing commercially with traps in the EEZ off Florida identify each trap with a trap tag issued under the State trap certificate program. Such persons would be exempted from the requirement for a vessel permit under the FMP, but could obtain the FMP tailing permit.	Status quo - Do not extend the state of Florida's trap certificate program to the EEZ.
B.	Undersize Lobsters as Attractants	Revise the FMP measure to conform to that of Florida, i.e., holding only 50 undersize lobsters or up to one lobster per trap in case the vessel has more than 50 traps aboard.	Status quo - Allow fishermen to hold up to 100 undersize lobster in a live well aboard a vessel while in the EEZ to use as attractants in baiting traps.
C.	Allowable Harvesting Gear	Revise the FMP to conform with the Florida rule specifying allowable gear in the spiny lobster commercial fishery in the EEZ off Florida.	Status quo -
D.	Night Diving Possession Limit	Limit the possession of spiny lobsters taken by divers at night from the EEZ off Florida to the bag limit.	Status quo -
E.	Measurement of Lobsters by Divers	Require that spiny lobsters harvested by divers in EEZ waters be measured while still in the water.	Status quo -
F.	Uniform Trap and Buoy Numbers	Require trap and buoy numbers to be at least two inches in height.	Status quc -

Table 2

Impacts of the Trap Certificate Program on the Ex-vessel Revenues of the Spiny Lobster Commercial Fishery

Fishing Season	Traps (1,000)	Landings Under Status Quo (1,000 lbs.)	Landings Under the Proposed Trap Measure (1,000 lbs.)	Difference in Landings (1,000 lbs.)	Increase in Ex-vessel Revenues at $3/lb ($1,000)	Increase in Ex-vessel Revenues at $5/lb) ($1,000)	Discounted Increase in Ex-Vessel Revenues at $3/lb ($1,000)	Discounted Increase in Ex-vessel Revenues at $5/lb ($1,000)
1992-93	750.0	6,445.3	6,445.3	0	0	0	0	0
1993-94	675.0	6,445.3	6,670.3	225.0	675.0	1,125.0	613.6	1,022.7
1994-95	607.5	6,445.3	6,872.8	427.5	1,282.5	2,137.5	1,059.9	1,766.5
1995-96	546.8	6,445.3	7,055.1	609.8	1,829.2	3,048.8	1,374.3	2,290.6
1996-97	492.1	6,445.3	7,219.1	773.8	2,321.3	3,868.9	1,585.5	2,642.5
1997-98	442.9	6,445.3	7,366.7	921.4	2,764.2	4,607.0	1,716.3	2,860.6
1998-99	398.6	6,445.3	7,499.6	1,054.3	3,162.8	5,271.3	1,785.3	2,975.5
1999-00	358.7	6,445.3	7,619.2	1,173.8	3,521.5	5,869.2	1,807.1	3,011.8
2000-01	322.8	6,445.3	7,726.8	1,281.4	3,844.3	6,407.2	1,793.4	2,989.0
2001-02	290.6	6,445.3	7,823.6	1,378.3	4,134.9	6,891.5	1,753.6	2,922.7
2002-03	261.5	6,445.3	7,910.8	1,465.5	4,396.4	7,327.4	1,695.0	2,825.0
TOTAL					27,932.2	46,553.7	15,184.2	25,306.9

Notes: 1. Assumed number of traps is 750,000 and is reduced by 10% every year starting in fishing year 1993-1994 ending in fishing year 2002-2003.
2. Status quo landings are assumed to be the average for fishing years 1987-1988 through 1990-1991 and held constant throughout the policy period.
3. Landings under trap certificate program are status quo landings adjusted by adding 3 pounds for every trap reduced (see text for discussion of this assumption).
4. Revenues are derived by multiplying increased landings by price, with price taken to be $3/lb or $5/lb.
5. 10% interest rate is used for discounting.

Source of basic data: Florida Marine Fisheries Commission, 1991.

Table 3

Impacts of Trap Reductions on Habitat

Fishing Year	Traps (1,000)	Trap Reductions (1,000)	10% of Trap Reductions (1,000)	Habitat Area Saved (1,000 sq. ft.)	Value of Habitat Area Saved ($1,000)	Discounted Value of Habitat Area Saved ($1,000)
1992-93	750.0	0	0	0	0	0
1993-94	675.0	75.0	7.5	180.0	1,980.0	1,800.0
1994-95	607.5	67.5	6.8	162.0	1,782.0	1,472.7
1995-96	546.8	60.8	6.1	145.8	1,603.8	1,205.0
1996-97	492.1	54.7	5.5	131.2	1,443.2	985.7
1997-98	442.9	49.2	4.9	118.1	1,299.1	806.6
1998-99	398.6	44.3	4.4	106.3	1,169.3	660.0
1999-00	358.7	39.9	4.0	95.7	1,052.7	540.2
2000-01	322.8	35.9	3.6	86.1	947.1	441.8
2001-02	290.6	32.3	3.2	77.5	852.5	361.5
2002-03	261.5	29.1	2.9	69.7	766.7	295.6
TOTAL				1,172.4	12,896.4	8,569.1

Notes: 1. Assumptions on the number of traps and trap reduction schedule are the same as those adopted in Table 2.
2. 10% of all traps used is assumed to damage the bottom habitat.
3. The area damaged by each trap is 24 square feet per fishing season.
4. The dollar value of damaged habitat area is $11 per square foot.
5. 10% interest rate is used for discounting.

Source of basic data: Florida Marine Fisheries Commission, December 1991.

Table 4

Summary of Effects of the Proposed Measures

Management Measures	Impacts of Proposed Management Measures
A. Trap Certificate Program	Positive effects on industry revenue of about $15.2 to $25.3 million and on habitat valued at about $8.6 million; may reduce inefficiencies in the commercial sector of the fishery
B. Undersize Lobsters as Attractants	Positive effects on industry revenue, but may render certain operations inefficient
C. Allowable Harvesting Gear	Minimal negative impacts
D. Night Diving Possession Limit	Significant adverse effects on commercial divers
E. Measurement of Lobsters by Divers	Increases harvesting cost of divers, but may have positive net effect on both the commercial and recreational sectors
F. Uniform Trap and Buoy Numbers	Positive effects on the industry

Note: For each management measure, the status quo is the rejected alternative.

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