

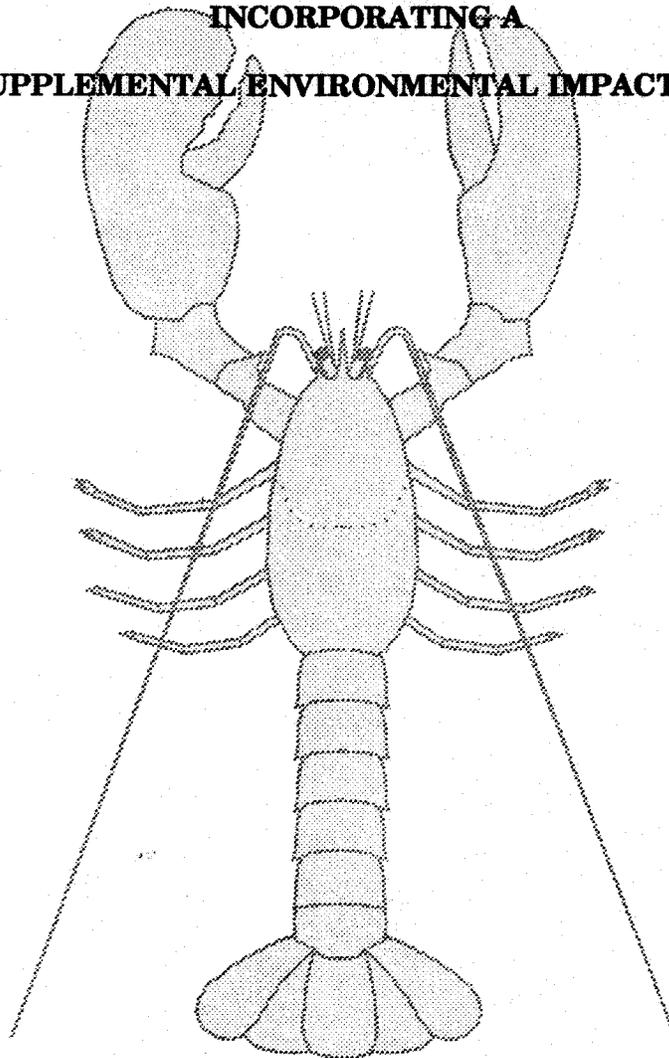
**New England Fishery Management Council**

**AMENDMENT #5**

**TO THE**

**AMERICAN LOBSTER FISHERY MANAGEMENT PLAN**

**INCORPORATING A  
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**



**New England Fishery Management Council  
5 Broadway  
Saugus, Massachusetts 01906-1097**

**January 24, 1994**

**I. COVER SHEET**

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**VOLUME II PUBLIC COMMENTS**

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### III. SUMMARY

The New England Fishery Management Council (Council) proposes Amendment #5 to the American Lobster Fishery Management Plan (FMP). The FMP has been amended four times since it was implemented in 1983. The purpose of Amendment #5 is to eliminate or prevent overfishing through adoption of a management program in the EEZ which includes the existing regulations plus additional actions. Current management measures for the EEZ require: a lobster fishing permit, trap identification, trap escape vents and an escape panel with degradable fasteners, no harvesting of egg-bearing females, no "scrubbing" of egg-bearing lobsters, a minimum carapace length of 3¼ inches, no landing of V-notch lobsters or of lobsters with tails mutilated in such a way as to obliterate a V-notch, no landing of lobster parts, and no "dumping" from a vessel which has been hailed by an enforcement agent.

The proposed new actions are intended to apply only in the EEZ. Future complementary management action may occur in territorial waters through state initiatives and/or under the auspices of the Atlantic States Marine Fisheries Commission (ASMFC). The new actions for the EEZ are:

- ◆ To freeze the minimum size limit for all lobsters at the current gauge size of 3¼ inches, thus rescinding the scheduled increases in the gauge size promulgated through Amendment #2. Under the "No Action" alternative, the gauge would be increased to 3 <sup>9</sup>/<sub>32</sub> on December 27, 1993 with a further increase to 3 <sup>5</sup>/<sub>16</sub> inches on January 1, 1995;
- ◆ To institute a new data collection system through a mandatory, uniform, logbook to obtain detailed information on landings, fishing effort, and catch rates. The information is needed for accurate stock assessments and for evaluating the management program;
- ◆ To establish a 5-year moratorium on new Federal vessel permits with a formal review of the effects of the moratorium in the third year;
- ◆ To institute a new requirement for an Operator's Permit for operators of fishing vessels engaged in the fishery;
- ◆ To require several categories of Federal vessel permits and limits on lobster landings according to the permit category;
- ◆ To develop a Stock Rebuilding Program, addressing all segments of the harvesting sector, in response to an assessment that the stock is overfished; and,
- ◆ To revise the overfishing definition.

#### IV. INTRODUCTION

Amendment #4 to the FMP, implemented on December 27, 1991 (57 FR 214), rescinded the scheduled increases in the minimum carapace length, establishing a minimum gauge size of 3¼ inches, with the proviso that a new, approvable, and comprehensive amendment (Amendment #5) would be submitted by December 27, 1993. Amendment #4 also proposed a definition of overfishing (accepted by the National Marine Fisheries Service) with a preliminary indication that overfishing may be occurring in the offshore stock. As a consequence, the Council announced its intention to develop a comprehensive amendment to the American Lobster FMP which reflected an industry consensus as to how the fishery ought to be managed so as to eliminate any overfishing.

Representatives of the U.S. lobster industry formed the Lobster Industry Working Group (LIWG) and, in the spring of 1992, began development of a comprehensive statement of management principles with the aid of the University of New Hampshire Office of Sea Grant. The LIWG submitted a report to the Lobster Oversight Committee and the Council. The industry plan was subsequently accepted by the Council as the basis for development of Amendment #5 in January, 1993.

The industry plan basically reaffirmed the current management regime, with the understanding that the minimum size should remain at 3¼ inches, but also proposed several new management measures, including a mandatory data reporting system and a short-term moratorium on new entrants to the fishery. The industry plan also included a limited entry system to be put in place on expiration of the moratorium, restrictions on the mobile gear fishery for lobster and proposed a revised definition of overfishing.

The industry plan recognized that certain provisions of the overall management regime, such as a uniform minimum size and protection for egg-bearing females, should apply to all segments of the fishery. However, the industry also stated that management should recognize that social, cultural and economic characteristics of the fishery vary by region and that the plan should allow different management approaches, by area, to achieve the common goal. The plan recommended a sub-regional approach whereby various programs would be put in place which had regional support and were designed to achieve an overall uniform result.

The Council believes that this approach to the development of a new, comprehensive amendment to the American Lobster FMP is consistent with the overall objective of the FMP:

*To support and promote the development and implementation, on a continuing basis, of a unified, regional management program for American lobster (Homarus americanus), which is designed to promote conservation, to reduce the possibility of recruitment failure, and to allow full utilization of the resource by the United States industry. The*

*management program should be sensitive to the need to minimize social, cultural and economic dislocation.*

Amendment #5 was developed through cooperative effort by the Council and representatives of the lobster industry, assisted by staff scientists from the Council, NMFS, and independent scientists.

## V. PURPOSE AND NEED FOR ACTION

### A. MINIMUM CARAPACE LENGTH

To maintain consistency with the objective of the FMP, it is desirable that the same minimum carapace length should apply to lobsters taken from both state and Federal waters. The current regulated minimum sizes for all states from Maine through New York is  $3\frac{1}{4}$  inches. Canadian minimum sizes vary from  $2\frac{1}{2}$  inches to  $3\frac{3}{16}$  inches, depending upon the management area. The preferred alternative of Amendment #5 freezes the minimum size in the EEZ at  $3\frac{1}{4}$  inches. This action is needed to avoid the automatic gauge increases mandated by Amendment #4 and to prevent serious legal and economic disruptions to the industry. The Mitchell Amendment to the Magnuson Fishery Conservation and Management Act (MFCMA) prohibits the shipment, transport, offer for sale, sale or purchase, in interstate or foreign commerce, of any whole live lobsters smaller than the Federal minimum size. If the Federal size limit is allowed to reach  $3\frac{5}{16}$  inches while the minimum size in state waters remains at  $3\frac{1}{4}$  inches, an estimated 10-15% of lobster landings from state waters would not meet the Federal standards.

### B. MANDATORY DATA COLLECTION

The American Lobster FMP (48 FR 36366) identified the need to establish a program of data collection for the lobster fishery including expansion of the weighout system, vessel logbooks, and sea sampling. The existing data collection programs, implemented principally by the states, have provided much of the information needed to properly manage the fishery, but there is a need for a uniform data collection program, grounded in a uniform mandatory logbook. Maine collects a random stratified sample of catch and effort information which is used to derive estimates of total landings and catch per unit of effort among other statistics. New Hampshire also employs a random sampling system to derive fishery statistics. Massachusetts has supplemented its catch reporting system with a vigorous sea-sampling program. Since the late 1970's, Connecticut has been collecting catch and effort information directly through a mandatory logbook. The only uniform information available from the states describing the fishery is in the form of a time series giving numbers of traps fished with landings from those traps, but such information may not be appropriate for accurate assessment of levels of effective fishing effort. The information which needs to be collected (including landings, number of traps hauled, and CPUE data) are seen by fishermen and fishery managers, alike, as necessary for assessing the status of the stock and its condition relative to criteria associated with the overfishing definition. A uniform logbook system will provide information necessary for assessing the stocks and will allow the states and the NMFS to concentrate resources on collecting detailed quantitative and qualitative information (through sea sampling, tag-recapture programs, etc.) appropriate to specific problems concerning lobster biology, seasonal movements and stock intermixture, and pre-recruit indices, among others.

### **C. OPERATOR PERMIT**

The primary purpose of most fishing permits under the MFCMA is to assist in the collection of fishery statistics, facilitate communications from Federal agencies regarding fishery issues, and to assist in various enforcement activities. Particularly in those cases where the permit has not been issued in the name of the vessel operator, permit sanctions levied as the result of violations of fishing regulations may not impact the individual actually responsible for the violation, the vessel operator.

Primarily to address the issue of accountability, there is a need for an Operator's Permit, issued specifically to individual vessel operators in the fishery. Bearers of an Operator's Permit would be held accountable for any violation of fishing regulations which occur on-board a vessel under their command while engaged in fishing or off-loading of the catch.

There is sentiment within much of the commercial fishing industry that new vessel operators who will enter the fishery in the future should meet certain conditions and satisfy certain criteria to demonstrate that they are qualified to assume the responsibility for the operation of a vessel in the fishery. Accordingly, the LIWG proposed a set of qualifying criteria which included two years of experience in commercial fishing and the requirement that at least one quarter of the applicant's earned income over a period of one year be from commercial fishing. The Council determined, however, that the income requirement may unfairly discriminate against professional operators of vessels for hire which serve as platforms for divers engaged in the recreational fishery in the EEZ. Moreover, institutionalizing a set of formal criteria may constitute unnecessary paperwork and unwarranted intrusion in the operation of small businesses. Consequently, the Council chose not to establish any criteria for new Operator Permits. It has been the custom that much of the fishing experience required to successfully operate in the fishery has been gained as a crewman aboard an established lobster fishing vessel. None of the proposed actions in the preferred alternative are anticipated to interfere with this custom.

### **D. STOCK REBUILDING PROGRAM**

The American Lobster FMP, in 1983, cautioned that the level of exploitation in the fishery was sufficient to raise concerns about the long-term viability of the fishery. These concerns remain valid despite recent record (29,089 mt in 1991) catch levels. These record catches may have been due to increased recruitment and increased fishing effort, coupled with expansion of the areal extent of the fishing grounds, but environmental factors may also be involved. The relationship between water temperature and lobster movements, activity, and landings is well documented (McLeese & Wilder 1958, Flowers & Saila 1972, Sutcliffe 1973, Dow 1977, Uzmann et al 1977, Ennis et al 1982, Caddy 1986, Drinkwater & Myers 1987, Fogarty 1988, Campbell et al 1991) and may partially explain record catch levels seen in both the U.S. and Canada in recent years. That relationship also suggests that with onset of a

cold period, significant reductions in landings may occur. It may be noteworthy that a 13% decline in total U.S. landings in 1992 occurred as water temperatures also experienced a downturn.

The most recent report of the Stock Assessment Workshop (SAW-16) has concluded that the lobster resource, as a whole, is currently overfished (according to the criteria of the overfishing definition) (NEFSC, 1993). Fishing mortality rates in the Gulf of Maine have apparently been on an increasing trend since about 1983, and have consistently exceeded the overfishing level since 1987 (Figure V.1). The calculated fishing mortality rate ( $F$ ) over the period 1989-1991 was 0.65 (48% annual rate). The level of fishing mortality which provides 10% of the maximum potential egg production per recruit at a minimum size of  $3\frac{3}{4}$  inches,  $F_{10\%} = 0.52$ . To meet the overfishing definition, fishing mortality rates in the Gulf of Maine (GOM) need to be reduced from 0.65 to no more than 0.52, a 20% reduction, if a minimum size of  $3\frac{3}{4}$  inches is maintained. Fishing mortality rates in the Southern Cape Cod to Long Island (SCCLI) inshore assessment area have apparently fluctuated without trend since about 1983, and were estimated to be 1.47 (77% annual rate) over the period 1989-1991 (Figure V.1). An unknown proportion of this mortality may be ascribed to net emigration of lobsters to the offshore area. Depending upon the female maturity schedules seen within specific regions of the SCCLI area, estimates of  $F_{10\%}$  ranged from 0.46 to 0.77. The  $F_{10\%}$  level for the SCCLI assessment area, which appeared in the current stock assessment, was 0.68 (NEFSC, 1993). Therefore, taking into consideration the variations seen in estimates of  $F_{10\%}$  together with a reasonable level of net emigration out of the SCCLI area, a 50% reduction in the fishing mortality rate is required.

The assessment of fishing mortality rates in the Georges Bank and Offshore (GBO) assessment area incorporated a range of estimates to reflect uncertainty with regard to the relative selectivity of pre-recruit lobsters to the survey gear as compared to that for fully recruited lobsters. All of the analytic procedures used in the assessment defined pre-recruit lobsters as that size range of sublegal-sized animals which will next molt into the legal-sized category. Fishing mortality rates in the GBO area have been steadily declining since 1987, and have apparently been below the overfishing level since 1990. Over the period 1988-1990, the average fishing mortality ranged from 0.24 to 0.51, depending upon whether pre-recruits are assumed to be equally vulnerable or only half as vulnerable to the survey gear as fully recruited lobsters, respectively (Figure V.1). If a net immigration of lobsters from the SCCLI area exists, then the true estimate of  $F$  for the GBO area would be somewhat higher. Therefore, with a  $F_{10\%} = 0.44$  for this stock component, the GBO resource is at least fully exploited.

The currently available stock assessment represents a very substantial improvement over previous efforts to assess the status of the resource. However, it is only the second iteration of recent attempts to craft a comprehensive assessment of the entire resource in U.S. waters. Consequently, there is a need to further refine all aspects of the assessment, including methodology in estimation of fishing mortality ( $F$ ), and the biological reference points ( $F_{10\%}$ ),

as new information becomes available.

It is commonly accepted that current levels of fishing effort are too high. The cost of maintaining an excessively large inventory of traps acts to reduce the net revenues that fishermen may realize from their labor. Total landings from all gear and the equivalent levels of total effort (expressed as total numbers of traps) appear in Table V.1. Total effort in the U.S. fishery reached one half million traps in 1946, doubled to one million traps by 1962, and doubled again reaching over two million traps in 1973. The level of effort has fluctuated without trend since the mid-1980's, varying between 2.5 million and 3.3 million traps (Table V.1).

With the finding from the most recent assessment that the over-all resource is overfished, it is necessary that a program of stock rebuilding be instituted. In general, a stock rebuilding program might include measures for reducing the fishing mortality rate while maintaining the current 3¼ inch minimum carapace length, or increasing the minimum carapace length while maintaining the current level of fishing mortality (not allowing any further increases in mortality), or a combination of an increased gauge plus reductions in fishing mortality.

## **E. MORATORIUM**

One of the major concerns in the lobster industry is that recent management action in the sea scallop and groundfish fisheries (substantial reductions in fishing effort and a moratorium on new vessels) may lead to a significant redirection of effort into the lobster fishery. In particular, the industry is concerned about a potential increase in effort in the directed lobster fishery by mobile gear. Although the lobster industry may hold certain philosophical reservations regarding moratoria in a generic sense, there is general consensus that a temporary moratorium on new vessels in the lobster fishery is needed during the next few years while the over-all fishing industry is in a transitional phase.

From a practical standpoint, management efforts needed to rebuild the resource to correct the current overfished condition would be compromised unless a cap is placed on fishing effort at current levels. The initial step to cap current effort would be to place a moratorium on the entrance of new vessels into the fishery, at least during the initial phase of the Stock Rebuilding Program. Moreover, this step will help assure that vessels which qualify under the moratorium and which will be required to assume the short-term costs associated with the Stock Rebuilding Program will also share the benefits from that program.

Table V.1. U.S. commercial lobster landings and fishing effort, territorial sea and EEZ combined.

Year	Trap Catch <sup>1</sup> (mt)	Traps <sup>2</sup> (1,000)	CPUE (kg/trap)	CPUE (lb/trap)	Total Catch <sup>3</sup> (mt)	Total Effort <sup>4</sup> (1,000 traps)
1942	5,582	278	20.1	44.2	5,582	278
1943	7,421	304	24.4	53.7	7,450	305
1944	8,094	326	24.8	54.6	8,130	328
1945	10,274	478	21.5	47.3	10,307	479
1946	10,984	587	18.7	41.1	11,012	589
1947	10,801	674	16.0	35.2	10,850	678
1948	9,390	617	15.2	33.4	9,519	626
1949	11,128	612	18.2	40.0	11,183	614
1950	10,394	579	18.0	39.6	10,521	585
1951	11,680	513	22.8	50.2	11,767	516
1952	11,194	545	20.5	45.1	11,351	554
1953	12,477	569	21.9	48.2	12,749	582
1954	12,080	628	19.2	42.2	12,465	649
1955	12,649	675	18.7	41.1	13,132	702
1956	11,515	667	17.3	38.1	12,028	695
1957	13,316	689	19.3	42.5	13,679	709
1958	11,857	754	15.7	34.5	12,349	787
1959	12,589	857	14.7	32.3	13,193	897
1960	13,310	844	15.8	34.8	14,136	895
1961	11,622	895	13.0	28.6	12,700	977
1962	12,122	909	13.3	29.3	13,378	1,006
1963	12,342	867	14.2	31.2	13,731	967
1964	12,169	904	13.5	29.7	13,915	1,031
1965	11,195	949	11.8	26.0	13,719	1,163
1966	11,572	947	12.2	26.8	13,400	1,098
1967	10,026	908	11.0	24.2	12,150	1,105
1968	12,210	966	12.6	27.7	14,755	1,171
1969	12,216	1,062	11.5	25.3	15,314	1,332
1970	12,249	1,464	8.4	18.5	15,489	1,844
1971	12,769	1,592	8.0	17.6	15,281	1,910
1972	13,513	1,716	7.9	17.4	14,626	1,851
1973	12,464	2,185	5.7	12.5	13,151	2,307
1974	11,987	2,134	5.6	12.3	12,947	2,312

<sup>1</sup> Total documented commercial catch by lobster traps.

<sup>2</sup> Total documented number of lobster traps used to take the total documented trap catch.

<sup>3</sup> Grand total commercial lobster landings from all gear.

<sup>4</sup> Total estimated number of lobster traps which would be required to take the grand total lobster landings, estimated from CPUE. This statistic represents an estimate of total effort in the fishery.

Table V.1. (continued) U.S. commercial lobster landings and fishing effort, territorial sea and EEZ combined.

Year	Trap Catch <sup>1</sup> (mt)	Traps <sup>2</sup> (1,000)	CPUE (kg/trap)	CPUE (lb/trap)	Total Catch <sup>3</sup> (mt)	Total Effort <sup>4</sup> (1,000 traps)
1975	12,897	2,198	5.9	13.0	13,699	2,322
1976	13,666	2,203	6.2	13.6	14,404	2,323
1977	13,901	2,216	6.3	13.9	14,412	2,288
1978	15,128	2,224	6.8	15.0	15,630	2,299
1979	16,440	2,197	7.5	16.5	16,912	2,255
1980	16,660	2,541	6.6	14.5	16,881	2,558
1981	17,287	2,378	7.3	16.1	17,751	2,432
1982	18,390	2,812	6.5	14.3	19,543	3,007
1983	19,955	3,168	6.3	13.9	20,329	3,227
1984	19,332	3,140	6.2	13.6	20,669	3,334
1985	20,146	2,685	7.5	16.5	21,317	2,842
1986	20,084	2,495	8.0	17.6	20,783	2,598
1987	19,841	2,930	6.8	15.0	20,826	3,063
1988	21,143	3,070	6.9	15.2	22,236	3,223
1989	22,872	3,044	7.5	16.5	23,829	3,177
1990	27,143	3,223	8.4	18.5	27,583	3,284
1991	28,220	3,142	9.0	19.8	29,089	3,232
1992	25,069				25,329	

<sup>1</sup> Total documented commercial catch by lobster traps.

<sup>2</sup> Total documented number of lobster traps used to take the total documented trap catch.

<sup>3</sup> Grand total commercial lobster landings from all gear.

<sup>4</sup> Total estimated number of lobster traps which would be required to take the grand total lobster landings, estimated from CPUE. This statistic represents an estimate of total effort in the fishery.

# FISHING MORTALITY RATES

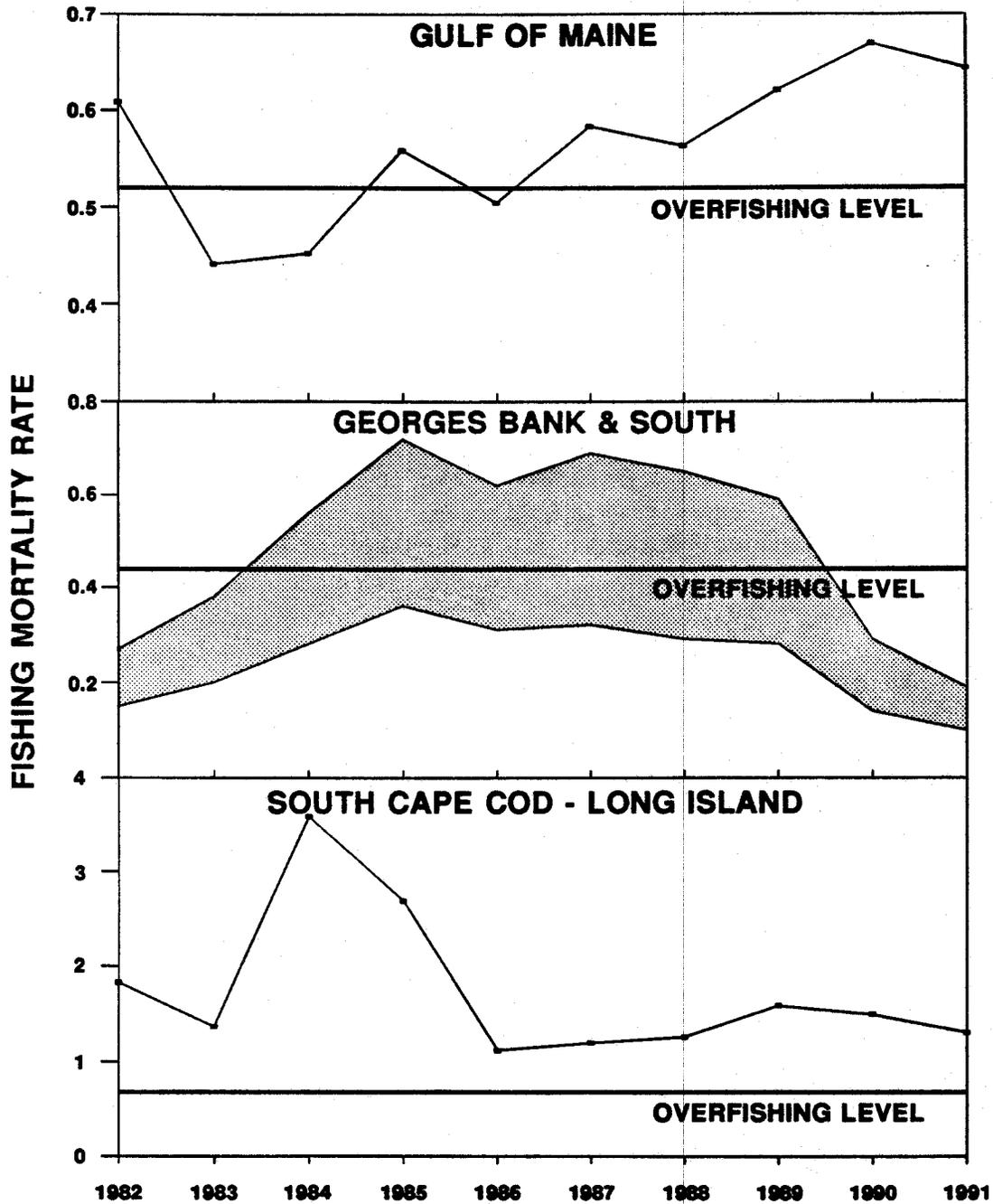


Figure V.1. Calculated fishing mortality rates for female lobsters, by assessment area, 1982-1991. Results are based on DeLury analyses. A range of estimates are shown for the Georges Bank & South offshore assessment area to reflect uncertainties regarding the relative selectivity of pre-recruits.

## **VI. PROPOSED ALTERNATIVES**

The proposed alternatives were developed jointly by the Council and ASMFC. In October, 1993, the Council approved the following alternatives for public review. A series of eleven public hearings were held during November, 1993 to receive public comment. After modifications in response to public comment, the Council approved the preferred alternative for submission as Amendment #5 on December 9, 1993.

### **A. "NO ACTION" ALTERNATIVE**

Through implementation of Amendment #4 to the American Lobster FMP, the minimum carapace length was rolled back to  $3\frac{1}{4}$  inches with the stipulation that the decrease was temporary and contingent upon the development of a comprehensive amendment which addressed controls on fishing effort with an emphasis on eliminating any overfishing. Amendment #4 further stipulated that if the comprehensive amendment was not developed within two years of the implementation date of Amendment #4, then the incremental increases in the minimum size promulgated by Amendment #2 would resume. Under the "No Action" alternative, therefore, the gauge will increase in two annual increments of  $1/32$ ", reaching a final size of  $3\frac{5}{16}$  inches, commencing December 27, 1993, but no other action would occur.

The "No Action" alternative, however, would not eliminate the currently overfished condition of the resource. The reason is that a uniform minimum size significantly larger than  $3\frac{5}{16}$  inches would be required to eliminate overfishing, even if the current level of fishing mortality was maintained.

### **B. NON-PREFERRED ALTERNATIVE**

Any new amendment must address the fact that the current stock assessment has determined that the American lobster resource is overfished. According to the Federal §602 Guidelines, when a resource under management is found to be overfished, a new management program must be designed to rebuild the stock (and must include a time-frame to accomplish that goal). Under this management alternative, only the minimum size limit would be increased. No other measures would be implemented. Therefore, the non-preferred alternative would be to immediately institute further gauge size increases, reaching a minimum size limit of at least  $3\frac{1}{2}$  inches (the gauge size needed to eliminate overfishing provided that no further increases in the fishing mortality rate occurred). If unrestricted fishing effort continues to increase (increasing the fishing mortality rate), then further gauge increases would become necessary.

## **C. PREFERRED ALTERNATIVE**

The preferred alternative addresses overfishing while retaining the flexibility to implement a mixture of management measures which might address only the minimum size limit, or only the fishing mortality rate, or a combination of both types of measures, and to allow the choice of which kinds of measures which ought to be implemented to be responsive to the social, economic, and biological conditions which exist within separate segments of the fishery. The preferred alternative includes six major provisions.

### **1. Minimum Carapace Length.**

Maintain the minimum carapace length in the EEZ at the current gauge size of  $3\frac{1}{4}$  inches to conform to and remain consistent with the minimum gauge size for all of the major lobster producing states from Maine through New York. In addition, the minimum dimensions of the escape vent to allow optimum escapement of sublegal lobsters must not be less than  $1\frac{7}{8}$  inches high by 6 inches wide for rectangular vents. For circular vents, traps must contain two openings not less than  $2\frac{3}{8}$  inches in diameter.

### **2. Mandatory Data Collection Program.**

#### **a. Vessel Reporting.**

All vessels taking and landing for sale any lobsters must record, on appropriate forms provided by the Regional Director, statistics which may include information describing the weight of lobsters landed, numbers of traps hauled (or number and length of tows made), and area or region fished, by day or trip (whichever is longer).

The initial specification of the reporting form implementing the mandatory fishing vessel logbook for the lobster fishery in the EEZ may be the Federal Fishing Vessel Trip Report. As soon as possible, the NMFS Regional Director will convene a meeting between NMFS, the Council, the states, and industry to resolve all concerns regarding the design of standardized reporting forms to be used by vessels and dealers in the lobster fishery.

The NMFS has been developing a standardized Federal Fishing Vessel Trip Report which is intended to be part of a new data collection program across all federally managed fisheries. A facsimile of the Federal Fishing Vessel Trip Report appears in Appendix A. The standard form is intended to collect information which may include the name of the vessel and its identifying numbers; crew size; type, description, and quantity of fishing gear; area(s) fished; number of trap hauls or tows; average soak time or length of tow; the species caught; pounds of fish kept and discarded; the name of the dealer and the date when the catch is sold; port of landing; and the signature and Operator's Permit number of the vessel captain. Copies of the reporting form might be filled out for each fishing trip and submitted to the NMFS Regional Director.

## **b. Dealer Reporting.**

Lobster dealers will be required to record, on forms provided by the Regional Director, statistics that may include, but are not necessarily limited to, the weight of all landed lobsters at the first transaction (regardless of whether the lobsters were harvested from State waters or the EEZ), the name of the vessel, and the name of the Operator's Permit holder landing the lobsters. Copies of the reporting form may be required to be filled out for each transaction at the discretion of the NMFS Regional Director and submitted to the Regional Director.

A significant portion of the catch of lobsters may be sold by harvestors direct to restaurants or other outlets. For the purpose of obtaining required fishery statistics from such transactions, specific arrangements will be developed between the States and the NMFS. State programs, which meet NMFS approval, may allow dealers to use either a federal Dealer Permit or a federally endorsed state Dealer Permit.

## **3. Operator Permit.**

### **a. Operator Permit.**

All operators of fishing vessels engaged in the commercial fishery for American lobster in the EEZ must possess an Operator Permit issued by the NMFS. Such operators will be held accountable for violations of fishing regulations and could be subject to permit sanctions.

Party and charter boats which may be engaged in the recreational fishery for lobster in the EEZ, using any gear, or vessels for hire which support divers who may be engaged in the recreational fishery for lobster in the EEZ, are exempt from the requirement to obtain an Operator's Permit, provided that no lobsters may be bartered or offered for sale, and may possess no more than 6 lobsters per person on board.

All operators of fishing vessels engaged in the commercial fishery for lobster may immediately be issued an Operator Permit, subject to the following requirements:

- 1) Any operator of a vessel fishing for lobster in the EEZ must have an Operator Permit issued by the NMFS Regional Director.
- 2) An operator is defined as the master or other individual on board a vessel who is in charge of that vessel. (This definition is specified in the Code of Federal Regulations, CFR 50 part 620.2)
- 3) The operator is required to submit an application, supplied by the Regional Director, for an Operator Permit in the American lobster fishery. An Operator Permit may be issued for a period of up to three years. All operators of fishing vessels engaged in the

American lobster fishery may immediately be issued an Operator Permit upon filing the application form with the Regional Director and meeting the other requirements in this part.

4) The applicant would provide his/her name, mailing address, telephone number, date of birth, and physical characteristics (height, weight, hair/eye color, etc.) on the application, and would be requested to provide his/her social security number. In addition to this information, the applicant must provide two passport-size color photographs.

5) The Operator Permit is not transferable.

6) Holders of Operator Permits must carry the permit aboard fishing vessels while engaged in fishing operations or while off-loading and must have it available for inspection by an authorized officer. All vessels, while engaged in fishing for American lobster or while off-loading must have aboard one or more bearers of an Operator's Permit.

7) The Regional Director may, after publication in the *Federal Register*, charge a permit fee.

#### **b. Dealer Permit.**

Any dealer of American lobster must have a Lobster Dealer Permit issued by NMFS. A dealer wishing to obtain a Lobster Dealer Permit must submit an application, supplied by NMFS, to be issued a permit for the period from January 1 through December 31 of each year. The Lobster Dealer Permit must be maintained at the place of business, will expire upon change in ownership of the business, is not transferable, and must be available for inspection upon request by an authorized officer. Holders of a Lobster Dealer Permit will be held accountable for violations of fishing regulations and could be subject to permit sanctions.

#### **4. Moratorium.**

Commencing on implementation of Amendment #5, no new vessel permits will be issued to vessels which did not possess a valid Federal lobster fishing permit and land lobsters, or to vessels or fishermen which did not possess a Federally endorsed state permit and land lobsters, prior to the control date, subject to the following considerations and the guidelines for the control date (given below).

Party and charter boats which may be engaged in the recreational fishery for lobster in the EEZ, using any gear, or vessels for hire which support divers who may be engaged in the recreational fishery for lobster in the EEZ, are exempt from the moratorium, provided that no lobsters may be bartered or offered for sale, and may possess no more than 6 lobsters per

person on board.

Any holder of a state lobster license endorsed for fishing in the EEZ which was obtained subsequent to the control date and has been held continuously since 1991 shall qualify under the moratorium if the license holder can document lobster landings through verifiable catch records (to include but not be limited to the original captain's log and dealer's receipts of landings) of at least 1,000 pounds in 1991 or 1992, and if the state issuing the Federal endorsement has failed to notify applicants of the establishment of the control date, and if the applicant was not also a holder of a Federal lobster permit.

**a. Length of the Moratorium.**

The Council has determined that the moratorium shall extend over a period of 5 years, commencing on the date of implementation of Amendment #5. During the third year of the moratorium, the Council will conduct a formal review of the effects of the moratorium to determine whether the action is having the effect which the Council had intended.

The Council may choose to extend the moratorium for a specified period or terminate it, through appropriate rulemaking, if the Council determines that such action is consistent with the stock rebuilding program. With expiration of the moratorium, the Council may choose to authorize issuance of new vessel permits (either with or without qualifying criteria).

**b. Control Date.**

On January 9, 1991, the Council established a control date for the American lobster fishery. Subsequently, the Council determined that the control date should be the date that the initial action was published in the *Federal Register*. Thus, the control date is March 25, 1991, and it is subject to the following guidelines:

1. It is the intent of the Council that in the event that a system of assigning fishing rights is developed as part of the American Lobster Fishery Management Plan, such assignments shall be based on historical levels of participation in the fishery prior to March 25, 1991, with consideration for recent investments that have not yet been reflected in measures of participation.
2. New or re-rigged vessels will be given consideration in the assignment of fishing rights if;
  - a) They were under construction or re-rigging for directed lobster fishing as of March 25, 1991, as evidenced by written construction contracts, work orders, equipment purchases, or other evidence of substantial investment and intent to participate in the lobster fishery; and,

- b) They possessed a lobster permit and landed lobster prior to March 25, 1991.
3. The public is further notified that it is the intent of the Council to consider historical participation to transfer with a vessel for transfers made after March 25, 1991, unless such transfer is accompanied by a written document indicating the agreement of both buyer and seller that any future fishing rights applicable to that vessel are not being transferred with the vessel.
  4. The Council further intends that any system of assigning fishing rights will take into consideration the following concerns relative to individuals or corporations that have sold a vessel within the time that may be chosen to determine historical fishing rights;
    - a) The degree of economic dependence upon the lobster fishery, including, but not limited to the percentage of income derived from the lobster fishery;
    - b) The extent of past participation in the lobster fishery;
    - c) The demonstration of intent prior to March 25, 1991 to re-enter the lobster fishery with another vessel.

**c. Appeal of Permit Denial.**

1. Any applicant denied a permit may appeal the denial. The appeal must be in writing. Any of the following grounds may form the basis for review:
  - a) The denial was based on mistaken or incorrect information or data;
  - b) The applicant was prevented by circumstances beyond his/her control from meeting relevant criteria; or
  - c) The applicant has new or additional information which might change the initial decision.
2. The applicant will have the right to an oral hearing.
3. Boats appealing a no-permit decision will be allowed to fish until the appeal process is resolved. An appeal of a moratorium permit denial shall be filed within one year of the date of implementation of Amendment #5.

**d. Permitting Program.**

The Council proposes to establish a new Federal vessel permitting program for all vessels,

regardless of gear type, engaged in the commercial lobster fishery in the EEZ. The initial specification of the new permitting system incorporates three categories of vessel permits, as described below. The Council may modify the described system, through the framework process, if it becomes necessary to meet the Council's objective of rebuilding the lobster resource.

Category A, Vessel Permit. Any vessel operating non-lobster pot gear which qualifies under the rules of the moratorium but is unable to demonstrate, by the best available documentation, that they accomplished at least one (1) trip prior to the control date which resulted in landings of at least 300 pounds of lobsters may be issued a Category A permit. Issuance of Category A permits will commence as soon as possible after implementation of Amendment #5. Commencing with the date of implementation of Amendment #5, vessels which have received a Category A permit may not land more than 100 lobsters, by count, per day or per trip, whichever is longer.

Category B, Vessel Permit. Any vessel operating non-lobster pot gear which qualifies under the rules of the moratorium and is able to demonstrate, by the best available documentation, that they accomplished at least one (1) trip prior to the control date which resulted in landings of at least 300 pounds of lobsters may be issued a Category B permit. Issuance of Category B permits will commence as soon as possible after implementation of Amendment #5. Commencing with the second year of implementation of Amendment #5, vessels which have received a Category B permit and operate in the lobster fishery in a Management Area requiring measures to address overfishing will be subject to restrictions which are equivalent to those placed on lobster trap vessels operating in the same Management Area.

Category C, Vessel Permit. Any vessel operating lobster pot gear which qualifies under the rules of the moratorium may be issued a Category C permit, commencing as soon as possible after implementation of Amendment #5. Commencing with the second year of implementation of Amendment #5, vessels which have received a Category C permit and operate in the lobster fishery in a Management Area requiring measures to address overfishing will be subject to restrictions which are equivalent to those placed on non-lobster trap vessels operating in the same Management Area.

Vessels electing to apply for either a Category A permit or a Category B permit will be subject to catch restrictions during the first year of plan implementation as discussed in the following section.

**e. First-Year Restrictions.**

None of the potential measures discussed in the section describing the Stock Rebuilding Program will become available for implementation until one year after Amendment #5 becomes effective. This fact still leaves the potential for a significant increase in fishing

mortality during the first year through displaced effort from other fisheries. Therefore, to avoid exacerbating the overfished condition of the resource to the extent possible, the Council proposes the following measures designed to have a braking effect on the fishery. The proposed restrictions would be in effect only during the first year of implementation of Amendment #5 over the calendar year, 1994, and would expire as the framework process came on line by the beginning of the second year (1995).

In the calendar year, 1994, the total catch of all vessels which qualify under the moratorium and operate any gear other than lobster pots should not exceed 4.5 million pounds. A catch level of 4.5 million pounds corresponds to 8 percent of the total landings of lobsters in 1992. If the total catch by such vessels reaches 6 percent of the 1992 catch level (3.35 million pounds) during the course of the year, then all such vessels will be limited to 100 lobsters, by count, per day or per trip, whichever is longer, for the remainder of the year.

The Council chose to establish a numerical cap on allowable landings during the first year primarily for the purposes of enforcement. This action does not imply that the Council is predisposed towards quota management. The Council's intent is to preserve the maximum possible flexibility with regard to the choice of management measures. The choice of 1992 landings was made as an effort towards preserving the status quo during the first year of plan implementation.

## **5. Stock Rebuilding Program.**

### **a. Management Areas.**

Amendment #5 proposes the creation of four Management Areas in EEZ waters; Gulf of Maine Inshore, Southern New England Inshore, Middle Atlantic Inshore, and Offshore (Figure VI.C.1). The boundary lines for the proposed Management Areas may be adjusted and any Area may be redefined or subdivided, as appropriate. The four proposed Management Areas are described as follows:

**Area 1. Near-shore EEZ Waters of the Gulf of Maine.** Beginning at the seaward boundary of the territorial waters of the state of Maine at the intersection with the international boundary between the U.S. and Canada; thence southerly along the boundary to the LORAN C 9960-Y-44400 line; thence southwesterly along the 44400 line to 70° W. Longitude; thence south along the 70° meridian to the LORAN C 9960-W-13700 line; thence southeasterly to the LORAN C 9960-Y-44100 line; thence southwesterly to the intersection of the 44100 line and the seaward boundary of the territorial waters of the state of Massachusetts; thence northerly along the seaward boundary of the territorial waters of the states of Massachusetts, New Hampshire, and Maine to the beginning point.

Area 2. Near-shore EEZ Waters of Southern New England. Beginning at the intersection of the LORAN C 9960-Y-44100 line and the seaward boundary of the territorial waters of the state of Massachusetts; thence easterly along the 44100 line to the intersection with the LORAN C 9960-W-13700 line; thence southeasterly to the intersection with the LORAN C 9960-Y-43700 line; thence westerly to the intersection with the LORAN C 9960-W-14610 line; thence northerly along the 14610 line to an intersection with a line running from Montauk Point on Long Island to Lewis Point on Block Island; thence westerly along said line to the intersection with the seaward boundary of the territorial waters of the state of New York easterly of Montauk Point; thence north to the intersection with the territorial waters of the state of Rhode Island; thence easterly along the seaward boundary of the territorial waters of the states of Rhode Island, and Massachusetts to the beginning point (see Figure VI.C.2 for a detailed view of the proposed boundary line in the Montauk Point - Block Island area).

In response to public comment, the Council has determined that the exact definition of the seaward boundary line of Management Area 2 which is contiguous with part of Management Area 3 (the LORAN C 9960-Y-43700 line) remains to be resolved. Accordingly, the Council has determined that the Effort Management Teams for Management Area 2 and Management Area 3 will be authorized to jointly consider the area between the LORAN C lines 9960-Y-43700 and 9960-Y-43500, with the eventual delineation of the area boundaries to result from a recommendation from these two EMT's for Council action.

Long Island Sound, being part of the territorial sea and not part of the EEZ, is not specifically part of Area 2. However, since Amendment #5 was developed as a joint effort by the Council and ASMFC, Long Island Sound might be established under ASMFC regulations as a separate management area.

Area 3. EEZ Offshore Waters. Area 3 is defined as the EEZ waters seaward of zones 1, 2, and 4, and westerly of the international boundary between the U.S. and Canada, with the proviso that the boundary line contiguous with Area 2 be resolved as discussed above.

Area 4. Near-shore Waters of the Middle Atlantic. Beginning at the intersection of a line between Montauk Point and Lewis Point on Block Island with the seaward boundary of the territorial waters of the state of New York east of Montauk Point; thence easterly along said line to the intersection with the LORAN C 9960-W-14610 line; thence southerly along the 14610 line to the intersection with the LORAN C 9960-Y-43700 line; thence southwestwardly to the intersection of the LORAN C lines 9960-Y-43500 and 9960-X-26400; thence southerly

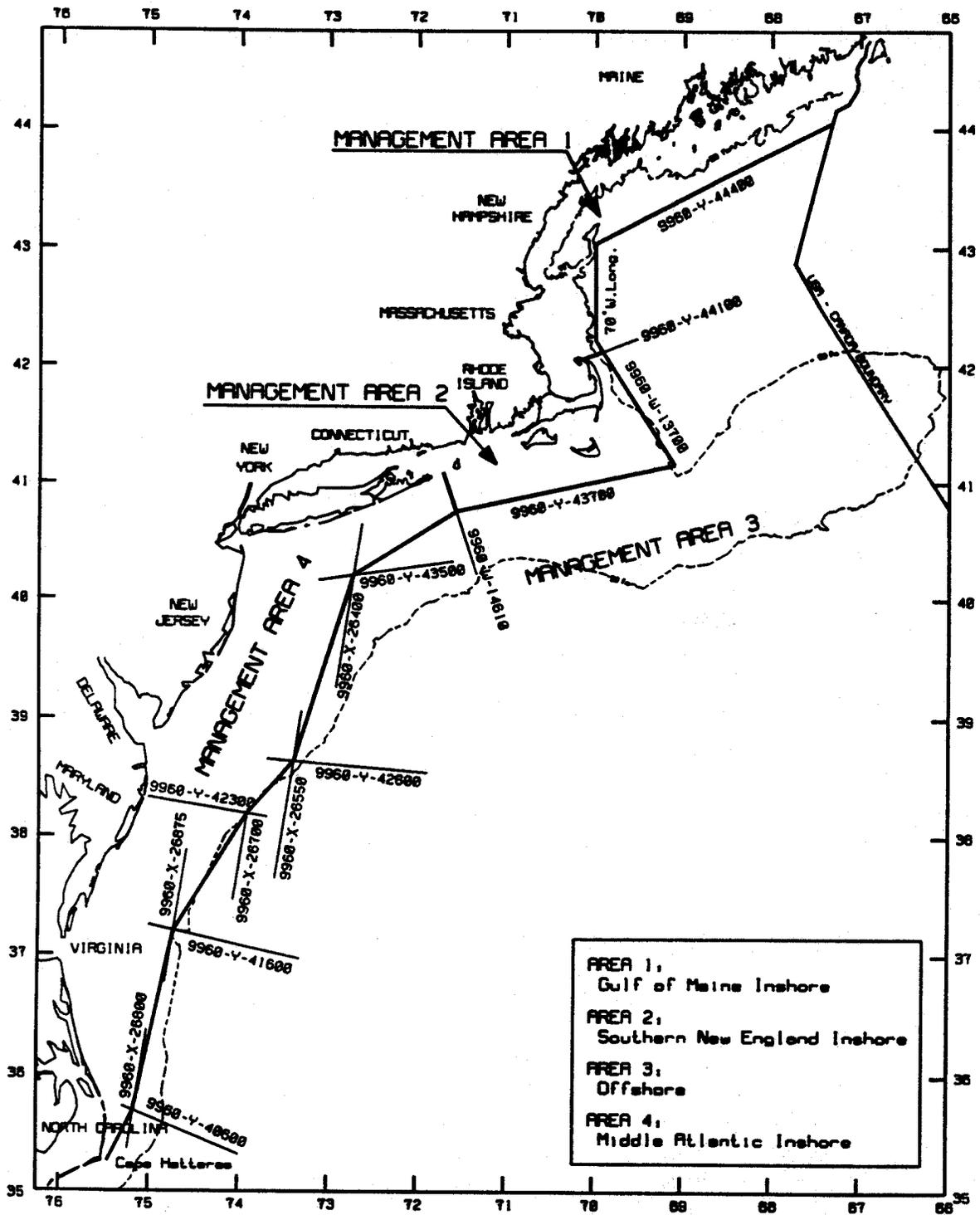


Figure VI.C.1. American lobster Management Areas established for the purposes of regional lobster management. Boundaries are defined principally by LORAN-C lines.

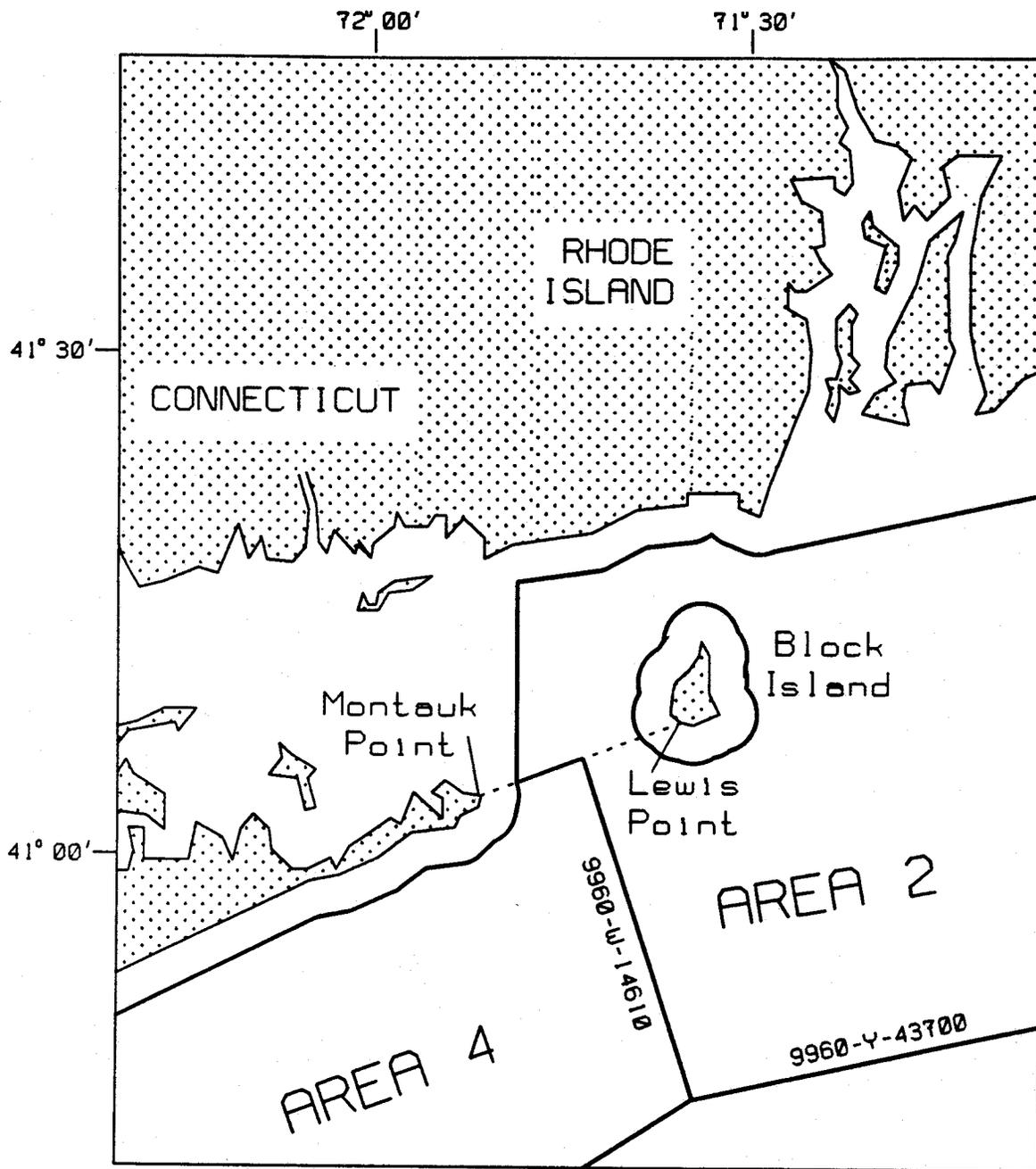


Figure VI.C.2. Detailed view of the boundary line between Management Areas 2 and 4 in the Montauk Point - Block Island area. State territorial waters are exempt from all Management Areas.

to the intersection of the LORAN C lines 9960-Y-42600 and 9960-X-26550; thence southerly to the intersection of the LORAN C lines 9960-Y-42300 and 9960-X-26700; thence southerly to the intersection of the LORAN C lines 9960-Y-41600 and 9960-X-26875; thence southerly to the intersection of the LORAN C lines 9960-Y-40600 and 9960-X-26800; thence southerly to a point directly east from Cape Hatteras at the seaward boundary of the territorial waters of the state of North Carolina; thence northerly along the seaward boundary of the territorial waters of the states of North Carolina, Virginia, Maryland, Delaware, New Jersey, and New York to the beginning point.

**b. Effort Management Teams (EMT).**

Amendment 5 proposes the establishment of Effort Management Teams (EMT), one EMT for each Management Area. Each EMT will be comprised of a common, core group of representatives from the NMFS, the states, and the Council (to be appointed by the affiliated agency) plus a group of area-specific industry representatives. The industry representation for each EMT will be appointed by the Council and will be comprised of separate sub-panels representing the industry within the separate Management Areas (1-4). Meetings of each of the EMT's will typically include the common, core group of agency representatives together with the appropriate industry sub-panel when considering management proposals for a particular Management Area. Issues having a broader context spanning more than one Management Area will require participation of the corresponding industry sub-panels.

The EMT's shall maintain a consultative relationship with the Council's Lobster Committee. Immediately upon establishment of the EMT's following implementation of Amendment #5, the EMT's shall begin developing their recommendations to the Council (through the Council's Lobster Committee) regarding the initial specification of the Stock Rebuilding Program to be established within each Management Area. Each EMT shall make their report no later than six (6) months following implementation of Amendment #5. By the end of the second year of implementation of Amendment #5, and at least annually thereafter, the EMT's shall report to the Lobster Committee the extent to which the objectives of Amendment #5 are being achieved, and will include in their report recommendations for further management actions if required. The EMT's shall be required to continuously monitor aspects of the specified management program and make annual reviews regarding the most appropriate position for boundary lines between Management Areas.

The Council requires that fishing mortality rates and biological reference points ( $F_{10\%}$ ) are reviewed annually in conjunction with the development of updates to the resource stock assessment under the SARC/SAW process. In the event that new information requires a revision of the biological reference points, the goal of the Stock Rebuilding Program shall be to ensure, to the extent possible, that any necessary impacts on the fishing industry associated with the program remains approximately the same in all Management Areas.

The EMT will consult with lobster fishermen operating within each Management Area

through the representative sub-panel sitting on the EMT with the intent of reaching consensus regarding the specific measures to be applied within each area, including such measures as individual transferable trap limits (ITT) and individual transferable quotas (ITQ) and other such measures which may require a plan amendment. The EMT will then determine whether the suite of measures specified will meet the goals established by the Council for the specific Management Area under the Stock Rebuilding Program. Depending upon that determination, further consultations may be required.

The EMT will be guided in its deliberations by the most current resource stock assessment which is available. Based on the most current assessment to date, the Council has determined that the Gulf of Maine segment of the resource is overfished and should be rebuilt within a 5-year period by reducing the fishing mortality rate a total of 20% at the rate of 5% per year. The Council also finds that the Southern New England inshore resource is overfished and should be rebuilt within a 10-year period by reducing the fishing mortality rate a total of 50% at the rate of 5% per year.

To achieve the goal of eliminating any overfishing which may be occurring in a manner which assures that all segments of the harvesting sector will share the burden, Amendment #5 proposes that the EMT's will make their recommendations regarding the Stock Rebuilding Program within each Management Area through consideration of the following optional measures which may be applicable to all segments of the harvesting sector within the Management Area:

Measures which may be implemented under the framework process:

- ◆ A minimum size limit Any gauge size larger than 3¼ inches could be used in combination with measures to control or reduce fishing mortality to address overfishing. If a gauge size of at least 3½ inches were employed, then only measures to control fishing mortality (to avoid further increases) would be required. Any chosen minimum size should be uniform within all Management Areas to facilitate enforcement. This measure would be applicable to all vessels, commercial and recreational.
- ◆ A maximum size limit A maximum gauge (for example, 5 inches) may increase egg production provided that the population includes large females. In areas where virtually no large females currently survive, effort reductions would also be necessary to make this an effective measure. This measure could be implemented within individual Management Areas, but it may create intra-state enforcement problems (eg., Massachusetts north and south of Cape Cod). If implemented within a specified Management Area, then the measure would be applicable to all vessels, commercial and recreational, operating within the same Management Area.
- ◆ Trap Limits Limitations on the total number of traps which individuals may operate

could generate substantial economic benefits. Trap limits would be difficult to enforce and it is uncertain how effective they would be in reducing fishing mortality. The number of trap hauls is a better measure of effective effort (better correlated with fishing mortality) than the number of traps in the water. A 1% reduction in fishing mortality might require a 2% or 3% or greater reduction in the number of traps. To have any benefits, either biological or economic, the traps which would still be fished cannot be fished any harder or hauled more often than they were before implementation of the measure. At present, it is not possible to determine a trap limit which would meet the biological targets. Moreover, it is likely that restrictions would be required on trap construction and configuration. Trap limits could be applied at varying levels between Management Areas. Despite the uncertainties associated with this measure, it holds the potential for significant economic (and biological) advantages. This measure would be applicable only to trap vessels.

- ◆ Seasonal closures Closures of designated Management Area(s) for specified periods of time during which all trap gear would be removed from the area for the duration of the closure. Landing of lobster by mobile gear or any other commercial gear from the same area(s) might be prohibited for the same period of time. Landings of other species would not be affected. It would be necessary to place some control on effort to maintain the status quo during the open season. Effort could neither be increased nor transferred. Seasonal closures could be utilized to enhance the total value of the fishery. Closures during the molting season might enhance egg production and reduce fishing mortality on females by allowing more females to egg out.
- ◆ Closed areas or zones Removal of all trap gear from a designated area or zone and closure of the same area or zone to fishing for lobster by mobile gear or any other commercial or recreational gear for an extended period of time for the purpose of creating a refuge. The closed area could be any appropriate size. Closed areas could be located within any one or more of the Management Areas, recognizing that close coordination between Federal and state management agencies might be required. The effectiveness of this measure could be enhanced if specific molting or nursery areas could be identified.
- ◆ Restrictions on allowable fishing times Restrictions on the length of time per day that traps may be hauled (or directed mobile gear tows or other commercial gear may be employed), or restrictions on the days per week that directed fishing for lobster may occur. Trap gear or other fixed gear may be left in place under this option. Allowable fishing times or periods may be tailored to preferences within individual Management Areas. Additional requirements might be needed to control gear and vessel upgrades. For example, it might be necessary to specify trap configuration, allowable crew size, hydraulic capacity of the pot hauler, etc.
- ◆ Restrictions on allowable catches Vessels possessing documentation (by the best

available records) with regard to specific catch levels over the period 1989-1992, will be assigned their average annual catch as the initial annual allocation for the second year of implementation of Amendment #5. In subsequent years, over the rebuilding period, annual allocations to individual identified vessels will be reduced (or increased) at the same rates that are realized in catches by all other vessels, regardless of gear type, operating within the same Management Area. At the end of the rebuilding period, catch allocation levels will be maintained, but may be subject to adjustment consistent with the most recently available quantitative stock assessment. The specific vessels identified in this part will also be subject to the common restrictions designated for the particular Management Area (including minimum size limits, maximum size limits, or other restrictions) as appropriate.

- ◆ Additional restrictions on gear This option could cover any means for modifying the fishing characteristics of fishing gear used for the purpose of taking lobster. For example, it has been suggested that larger-sized vents might be required in lobster pot gear so as to allow a certain proportion of legal-sized lobsters to escape a lobster pot.
- ◆ Any other restrictions which the Council/ASMFC may designate for the purpose of reducing or controlling fishing mortality rates. A measure may be designed to operate in combination with some other measure (such as a seasonal closure for reducing fishing mortality) which would prevent additional effort (without necessarily reducing effort). Such a measure would be imposed for the purpose of controlling fishing mortality at the status quo without actually reducing it. Some other measure, not specifically noted above, may be designed to actually reduce fishing mortality.

### c. Framework Process.

The Council will initiate development of the Stock Rebuilding Program by soliciting recommendations from the Effort Management Teams. With Council approval of the recommended management measures, public hearings will be held to receive comments on the proposed Stock Rebuilding Program. After consultation with the Council and ASMFC and upon the recommendation of the Council and ASMFC, the Regional Director will promulgate appropriate regulations to implement the Stock Rebuilding Program within one year after the date of implementation of Amendment #5. The delay in the starting date for the Stock Rebuilding Program of up to one year following implementation of this amendment will provide the opportunity for fishermen within each Management Area to reach a consensus as to which of the options listed above should apply in their respective Management Area.

The Council and ASMFC, through consultation with the ASMFC Lobster Scientific Committee within the SARC/SAW process and with the EMT, shall continue to monitor the

effectiveness of the Stock Rebuilding Program and to ensure, to the extent possible, that regional measures (within a Management Area) do not shift costs from one Management Area to another. The plan monitoring effort shall also make annual determinations whether the program is making adequate progress in meeting the goal of eliminating any overfishing. If it is determined that the initial specification of the Stock Rebuilding Program is inadequate to meet the goal of the program, then the Council, in consultation with ASMFC, shall consider additional measures according to the procedure outlined above. After Council action, with public hearings, the NMFS Regional Director, in consultation with the Council and ASMFC, shall promulgate appropriate regulations as may be necessary to modify the Stock Rebuilding Program.

#### **6. Default Measure**

If the Council fails to take action under the framework process in any year after the first year of plan implementation to implement measures consistent with the stock rebuilding program, then management of the fishery in the EEZ will be assumed by the Secretary of Commerce.

## VII. REVISED DEFINITION OF OVERFISHING

Recruitment overfishing may be defined as fishing at a combination of the minimum size limit (age at entry) and fishing mortality rate such that the ability of the stock to replace itself on a continuing basis is jeopardized. Recruitment overfishing reduces the reproductive potential of the stock below a critical threshold leading to a significant decline or even the total collapse of the stock. The §602 regulations, Guidelines for Fishery Management Plans, require each FMP to specify an objective and measurable definition of overfishing. When overfishing is found to occur, those regulations require specification of a program for rebuilding the stock over a period of time specified by the Council which is acceptable to the Secretary of Commerce.

### A. THE CURRENT DEFINITION OF OVERFISHING

The current definition of overfishing, implemented with Amendment #4 to the American Lobster FMP, is:

**The American lobster resource is considered to be overfished when, based on information concerning the status of the resource throughout its range, it is harvested at a fishing mortality rate (F) and minimum size combination that results in a calculated egg production per recruit of less than 10 percent of a non-fished population.**

### B. THE REVISED DEFINITION OF OVERFISHING

The definition of overfishing is revised as follows:

**The American lobster resource is considered recruitment overfished when, throughout its range, the fishing mortality rate (F), given the regulations in place at that time under the suite of regional management measures, results in a reduction in estimated egg production per recruit to 10% or less of a nonfished population.**

The development of the status of the stock report and the evaluation of fishery induced effects will consider information based upon one or more indices including but not limited to:

- a) larval abundance index in surface waters,
- b) larval settlement index (the relative success of each new year class in reaching the benthos),
- c) pre-recruit indices by year class,
- d) landings,
- e) size composition of the landings,

- f) spawning stock biomass,
- g) numbers of egg-bearing females,
- h) effort levels and catch per unit of effort,
- i) possible development of relationships of biological parameters to water temperatures, or other environmental parameters,

## VIII. AFFECTED ENVIRONMENT

### A. INTRODUCTION

#### 1. The Species and Its Distribution.

The American lobster, *Homarus americanus*, is a bottom-dwelling, marine crustacean that has a shrimp-like body and ten legs, two of which are enlarged to serve as crushing and gripping appendages. The American lobster is widely distributed over the continental shelf of the Western North Atlantic. It belongs to a group of decapod crustaceans called "clawed lobsters"; and its counterparts in the Eastern North Atlantic are the European lobster, *H. gammarus*, and the Norwegian lobster, *Nephrops norvegicus*. Along the inshore waters of the Western North Atlantic, the American lobster ranges from Labrador to Virginia; and along the outer continental shelf and slope within the U.S. exclusive economic zone (EEZ) it ranges from Georges Bank to North Carolina. It has been found in waters of the intertidal zone and to as deep as 700 meters (about 2,300 feet). The meat of the lobster, which is located primarily in the claws and the tail, is so highly prized that it supports one of the most intense and valuable fisheries in North America.

#### 2. Principal Areas of Production.

The major lobster population centers are located within the Gulf of Maine and the New Brunswick and Nova Scotia coastal waters. These areas support inshore fisheries which supply 90 percent of the total landings of American lobster. In waters of the United States, there are two important areas of population; inshore and offshore. One way of showing the delineation between inshore and offshore populations is to examine catch data broken down between state waters and the EEZ. Table VIII.A.1. indicates that 80 percent of the 1992 landings in the northern Gulf of Maine came from state waters. Overall, 73 percent of 1992 landings were from state waters. Typically, however, the coastal fishery is not strictly defined by the seaward boundary of the territorial sea, but extends from the shoreline out to a depth of 40 meters (22 fathoms). This population supports the coastal trap fishery and accounted for 86 percent of the U.S. landings in 1992. A secondary area of production is on the continental shelf and margin from Corsair Canyon to Cape Hatteras and the central Gulf of Maine in depths to 600 meters (333 fathoms). This population supports an offshore lobster fishery that employs both traps and bottom trawls and accounted for nearly 14 percent of the U.S. landings in 1992. The remainder of 1992 landings (0.1 percent) was taken by other gear.

#### 3. Stock Identification.

The management unit addressed by this FMP probably includes numerous local groups of lobsters. Lobster are basically territorial, and their home ranges generally do not exceed a few kilometers. Although discrete groups may exist, they are difficult to define; and the degree to which mixing occurs, as recruits or as adults, is not known. Newly-hatched

Table VIII.A.1. The catch of American lobster in state territorial waters and the EEZ by state in 1992 (metric tons)

State	State Waters		EEZ		Total Landings
	Landings	Percent	Landings	Percent	
Maine	9,757	80	2,439	20	12,196
New Hampshire	555	80	139	20	694
Massachusetts	4,386	64	2,432	36	6,818
Rhode Island	1,362	45	1,698	55	3,060
Connecticut	1,027	89	123	11	1,150
New York	1,529	95	79	5	1,608
New Jersey	380	69	171	31	551
DEL-MAR-VA		0	12	1	12
<b>TOTAL</b>	<b>18,996</b>	<b>73</b>	<b>7,093</b>	<b>27</b>	<b>26,089</b>

Source: Lobster Plan Development Team, 1993.

lobster larvae are planktonic and, therefore, can be dispersed over wide areas. Lobster also become more mobile after they mature, and numerous tagging experiments have shown directed movement particularly of the larger lobsters. Along the Maine coast some large, mature lobsters move in a southwesterly direction (Dow, 1974; Krouse, 1977). Egg-bearing lobster along the Eastern shore of Cape Cod move into Cape Cod Bay during the summer months (Morrissey, 1971). Lobsters that inhabit the outer edge of the continental margin move inshore and offshore seasonally, as well as laterally, between canyon areas (Uzmann, Cooper and Pecci, 1977).

As a consequence of the demonstrated large scale movement patterns and stock admixture exhibited by many lobster populations, attempts to define discrete lobster stocks based on morphology, parasite infestation, and biochemical and genetic markers have been equivocal. Differences between inshore and offshore lobsters based on parasite infestation has been used to infer stock differentiation (Uzmann, 1970). However, studies using electrophoretic techniques and mitochondrial DNA (Barlow & Ridgeway, 1971; Tracey *et al*, 1975) have shown low levels of genetic variability and little clear evidence of stock separation. Low sample sizes may have contributed to the lack of statistical significance in some of the studies. Examination of morphometric and meristic variables provides some evidence of differences between inshore and offshore populations (Saila & Flowers, 1969) but levels of correct classification using discriminant functions were not high.

Consideration of large scale hydrographic factors suggests that areas within the Gulf of Maine may be connected by a common larval supply. Larval drift from northeastern Georges Bank may contribute to Gulf of Maine populations. Similarly, offshore lobsters in the southern New England region probably contribute larvae to adjacent coastal areas.

Life history parameters, especially growth and maturation rates, differ markedly among regions. Sharp demarcations exist between coastal lobster populations in the Gulf of Maine, offshore lobsters in the Georges Bank & South offshore area, and the warmer -water populations in inshore areas south of Cape Cod. These life history differences have important implications for the determination of biological reference points such as yield per recruit and egg production per recruit. A single overall rate of growth, maturation schedule, and fecundity cannot be applied to all components of the stock. Moreover, significant regional differences exist in fishing practices and in the regulatory environment. The overall assessment of the lobster resource requires these differences between various regions be accounted for. The initial attempt at a regional approach to assessment of the resource considered two separate lobster population groupings: 1) the Gulf of Maine (inshore and offshore), and 2) Southern New England - Georges Bank offshore (NEFSC, 1992). The most recent stock assessment (NEFSC, 1993) considered three separate assessment areas: 1) Gulf of Maine (GOM), 2) Georges Bank & South - offshore (GBO), and 3) South of Cape Cod to Long Island Sound - inshore (SCCLI) (Figure VIII.A.1). The assessment recognized that a currently unquantifiable exchange of lobsters exists between the GBO and SCCLI assessment areas. Although the biological parameters are so different between these two regions, a combined analysis was also attempted with inconclusive results.

#### **4. Stellwagen Bank Marine Sanctuary.**

On October 7, 1992, Congress reauthorized Title III of the Marine Protection, Research and Sanctuaries Act and passed an amendment which designated Stellwagen Bank as a National Marine Sanctuary. The area, located between Cape Cod and Cape Ann, Massachusetts, is known to support a rich and diverse population of marine life at various times of the year, including several species of endangered whales, groundfish, bluefin tuna, and lobster. Commercial fishing is not a regulated sanctuary activity, and will continue to be the responsibility of the NEFMC.

The Sanctuary designation places a prohibition on the "exploration for, and mining of, sand and gravel and other minerals" and requires a consultation process of agencies proposing actions which are likely to destroy, cause the loss of, or injure any Sanctuary resource. To the extent that certain activities with deleterious effects on commercially important species may be affected, the designation may have positive impacts on the lobster fishery.

The coordinates defining the Stellwagen Bank Marine Sanctuary are given in the following table.

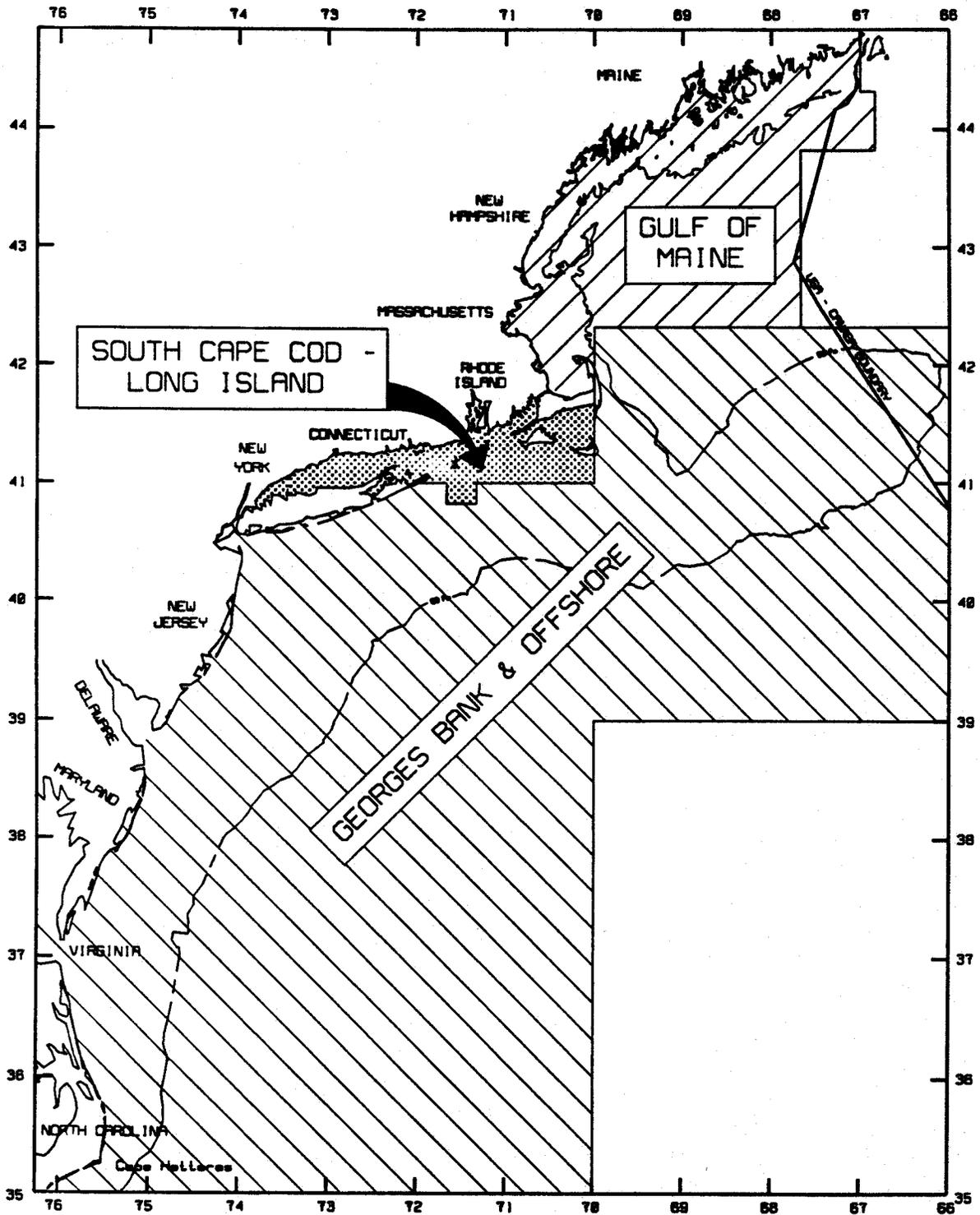


Figure VIII.A.1. The three stock assessment areas; Gulf of Maine (GOM), Georges Bank & Offshore (GB&O), and South Cape Cod - Long Island (SCCLI), used in the most recent stock assessment (SAW 16).

## STELLWAGEN BANK MARINE SANCTUARY

Point	Latitude	Longitude	Approximate Loran Coordinates	
S1	42°34.0'	70°23.5'	13737	44295
S2	42°28.8'	70°39.0'	13861	44295
S3	42°18.6'	70°22.5'	13810	44209
S4	42°05.5'	70°23.3'	13880	44135
S5	42°11.0'	70°04.0'	13737	44135

### B. PHYSICAL ENVIRONMENT

#### 1. Overview.

Habitat may be defined by environmental factors which include temperature, salinity, dissolved oxygen, light intensity, current, and substrate. However, contaminants from man's manipulation of the environment cannot be overlooked as potentially impacting on the well-being of the lobster resource and fishery. These environmental factors can be considered relative to three life history stages of the lobster: eggs/embryos, larvae/postlarvae, and juveniles/adults.

#### 2. Temperature.

Environmental influences on the reproductive and developmental processes of lobster can occur in a number of ways. Water temperature may have a significant impact; temperature must reach seasonal extremes (i.e., decline to ~8-10 °C during winter) to maintain a balance between the synchronization of the molt and ovarian cycles of female lobster (Aiken and Waddy 1985). Warmer winter temperatures favor molting and oocyte resorption (Aiken and Waddy 1986) although photoperiod has been implicated as a factor governing spawning (Nelson *et al.*).

Temperature has a strong effect on embryonic development with the onset of hatching varying with year and location and the temperature history of individual females (Aiken and Waddy 1986). Since temperature can affect the rate at which the embryo assimilates lipids, delayed hatching may result in the premature utilization of lipid reserves which are important to survival during the pelagic larval stages.

The duration of the planktonic phase is dependent upon seawater temperature. Time from hatching to stage IV is approximately 10 days at 22-24 °C and nearly 2 months at 10 °C. At 5 °C larvae generally die without reaching stage IV (Templeman 1936).

Temperature may have a significant impact on juvenile and adult lobster growth, survival and reproduction. Aiken and Waddy (1986) reported that juvenile and adult lobsters are found seasonally in waters ranging from 0 °C to 25 °C. Acclimation to the upper lethal limit depends upon acclimation temperature but tolerance to any temperature declines as optimal dissolved oxygen and salinity levels decrease.

### 3. Currents.

Larvae tend to concentrate in surface waters where currents converge and in windrows where floating debris may provide refuge (Cobb *et al.* 1983; Harding *et al.* 1982). Thus, wind-induced circulation patterns, for example, prevailing southwesterly winds in the northeast U.S. during the period of larval availability, may influence larval recruitment to coastal areas (Fogarty 1983). The active swimming capability of Stage IV postlarvae may also affect distribution patterns.

### 4. Salinity.

The impermeable egg membrane may provide some measure of protection for the embryo against low salinity because embryos require a longer adaptation time to low salinities than hatchlings or prelarvae (Charmantier and Aiken 1987). Larval lobsters are sensitive to salinities below 20 ppt and swim to greater depths to avoid lower salinity surface waters. In contrast, juveniles and adults can tolerate a broader range of salinities, from 15-32 ppt (Harding 1992).

Stage IV lobsters will delay settlement if faced with unsuitable habitat (Botero and Atema 1982; Cobb *et al.* 1983). Larval stages 1-3 were more adaptable to low salinities than stage IV (Charmantier *et al.* 1984) and less resistant to elevated salinity than postlarvae and juveniles (Charmantier *et al.* 1985). No stage 3 or 4 larvae survived salinities below 12.5 ppt. No larval molting occurred beyond a salinity of approximately 40 ppt. Salinity presents a greater problem for pelagic larvae subject to rainfall than for juveniles and adults (Aiken and Waddy 1986). Although excessive run-off can lower bottom salinities and cause mortality. Lobsters prefer higher salinities (20-25 ppt) over lower (10-15 ppt) (Jury 1992). Males can tolerate lower estuarine salinities better than females.

### 5. Dissolved Oxygen.

Miller *et al.* (1992) found that larval lobsters appear twice as sensitive as juveniles and adults to reduced DO. The result may be retarded growth and molt rate.

Juvenile and adult lobsters approaching molt are more susceptible to low DO since oxygen consumption peaks at this time (Penkoff and Thurberg 1982). Oxygen consumption also increases with stress, feeding, increased activity and water temperature (McLeese 1956).

## **6. Light Intensity.**

Larval lobsters are phototaxic. A minimum light intensity is required to attract larvae to the sea surface but early stage larvae seek lower depths in bright sunlight (Templeman 1933). Juvenile and adult lobsters in Long Island Sound remained in burrows when ambient light exceeded  $4 \times 10^{-2} \mu\text{W}/\text{cm}^2$  (Weiss 1970). Emergence from burrows occurred 25 minutes after sunset when underwater light intensity was  $2 \times 10^{-2} \mu\text{W}/\text{cm}^2$  from June - November. During December and January they waited until 40 minutes after sunset ( $0.02 \times 10^{-2} \mu\text{W}/\text{cm}^2$ ).

## **7. Substrate.**

The pelagic larval period ends when stage IV postlarvae settle to the bottom. Postlarvae will actively seek suitable substrate with a series of descents and will delay molting to fifth stage until successful settlement is completed. Howard and Bennett (1979) and Pottle and Elnor (1982) found that lobster tend to choose gravel rather than silt/clay substrates. However, when Botero and Atema (1982) included macroalgal-covered rock in the choice options, it was preferred by settling lobster, followed by rocks on sand, mud, and sand. Cobb et al. (1983) found postlarvae settle rapidly into rock/gravel, macroalgal-covered rock, salt-marsh peat, eel grass, and seaweed substrates. Barshaw *et al.* (1985) and Barshaw and Bryant-Rich (1988) observed postlarval lobster to settle quickly into eelgrass, followed by rocks with algae in sand, then mud. Barshaw and Bryant-Rich (1988) emphasized the importance of macroalgal-covered rock habitat and the faster settlement of post larval lobster into it compared to rock and mud, and a lower rate of lobster mortality experienced on it. Although mud habitat is the least preferred, the demonstrated ability of lobster to burrow into it (MacKay 1926; Cobb 1971; Berrill and Stewart 1973; Botero and Atema 1982) implies that when mud habitat is the only option, postlarvae will settle into it and construct and maintain burrows there. Under experimental conditions Stage IV lobsters settled within 34 hours of searching on macroalgal-covered rocks, within 38 hours on scattered rocks in sand, and within 62 hours over mud bottom (Harding 1992).

The importance of macroalgal covered rock, eel grass, peat and other habitat types which greatly exceed the total area that inshore cobble represents throughout the range of the lobster may have been underrated when considering a bottleneck hypothesis (Caddy 1986) which isolates cobble as the key habitat. Appropriate habitats protect postlarvae from predation and provide food and shelter thereby minimizing movement and exposure. Lobster may not leave their burrows until they reach a carapace length between 20 and 40 mm (Bryant-Rich and Barshaw 1988). However, a shift from this shelter-based existence to a wider ranging, foraging lifestyle may occur with the greater energy needs and possible mitigation of predation associated with increasing body size.

Lobsters in this early benthic phase (5-40 mm CL) were found by Wahle (1988) and Wahle and Steneck (1991) to be most abundant in cobble and macroalgal-covered bedrock and rare

in featureless mud, sand, or bedrock. However, it is difficult to conclude that shelter-providing substrate, cobble in particular, represents a natural demographic bottleneck when juvenile lobsters occur in other substrates, e.g. eelgrass, bedrock, and mud (Addison and Fogarty 1992). The definition of suitable lobster habitat is complex with its attractiveness determined by shelter sites, prey distribution, species composition, abundance and availability. The range of habitat types available to juvenile lobsters increases as pressure from predation declines. The need for specific shelter size may be resolved by the lobster's ability to manipulate its environment which can result in the construction of suitable shelter from otherwise uninhabitable substrate. The excavation of shelters under man-made objects is common among juvenile and adult lobsters and may be important on featureless bottom (Cooper and Uzmann 1977).

## **C. BIOLOGICAL ENVIRONMENT**

### **1. Lobster Life History.**

Growth and reproduction are keyed around the molting cycle. The lobster is encased in a hard external skeleton that provides protection and body support. The skeleton is cast off periodically, which allows the body size to increase and mating to take place.

Mating occurs when the female is soft after molting. Sperm is deposited and stored until the eggs are laid, which can be up to two years. When the eggs are laid, they are fertilized and attached to the underside of the tail, where they are carried for 10 to 11 months. Females are called "berried" during the time they are carrying the eggs. Hatching begins about mid-May to mid-June as water temperatures rise to about 15°C and may continue to mid-summer.

Newly-hatched lobsters go through a free-swimming, larval stage during the first four molts, or for about 15-25 days. At this time they are planktonic and disperse according to the prevailing water movements. After the fourth molt the larvae resemble the adults and begin to seek the bottom.

Lobsters molt about 20 to 25 times between hatching and sexual maturity. Ten of these molts are during the first year, and by age five they average one per year. Lobsters reach legal, commercial size after five to seven growing seasons, depending on water temperature. After sexual maturity, females molt and carry eggs in alternate years so that the molt frequency of the female may be only half that of the male; and older females tend to be smaller than males of the same age. A significant proportion of lobsters are landed before reaching sexual maturity, particularly in the Gulf of Maine.

### **2. Stock Assessment.**

Previous stock assessments of American lobster have used size-based population models to estimate mortality rates since ageing is not feasible for the species. A comprehensive assessment of inshore and offshore components of the stock was first attempted at SARC 14 (NEFSC, 1992). The analysis evaluated two provisional stock units (Gulf of Maine and Offshore Southern New England/Georges Bank) using two different approaches. Length-based cohort analysis (Jones, 1974) was applied to data from five separate inshore and offshore populations. Fishing mortality rates were estimated, ranging from 0.5 to 2.0. However, the method was considered provisional since combined inshore/offshore components were not evaluated simultaneously.

A second approach to lobster assessment was tested at SARC 14. A modified DeLury model was used to examine landings data (numbers) and research vessel trawl survey catch-per-tow indices for pre-recruit and fully-recruited lobsters to develop estimates of fishing mortality for the two stock areas (Conser and Idoine, 1992).

The analyses presented at SARC 14 for the first time linked inshore and offshore components of the resource so that stock status could be evaluated relative to the overfishing definition adopted by the Council. However, the SARC 14 lobster assessment was considered very provisional for a number of reasons:

- ◆ inshore stock components south of Cape Cod could not be evaluated since required data were not available at the time,
- ◆ length-based cohort analyses should have included both inshore and offshore catch at length data (but, again much of the required data were not available at the time),
- ◆ only a portion of the available time series of NMFS research vessel survey indices for pre-recruit and fully-recruited lobsters were utilized, and trawl survey series for Massachusetts, Rhode Island, and Connecticut were not incorporated in the analysis,
- ◆ the analysis for the Gulf of Maine should have taken into account the effects of v-notching and the maximum gauge (five inches) enforced in Maine waters.

For these and other more technical reasons, SARC 14 cautioned that estimates of fishing mortality rates and stock status relative to the overfishing definition were "... very preliminary and thus will likely change, perhaps substantially...".

SARC 16 (NEFSC, 1993) developed a much more comprehensive assessment which (1) incorporated three lobster stock assessment units encompassing the entire range of the species in US waters, (2) extended and expanded research vessel trawl survey abundance indices for pre-recruit and fully-recruited lobsters from surveys by NMFS, Massachusetts, Rhode Island, and Connecticut, (3) improved estimates of the landings and catch size composition for the three assessment areas, (4) calculated new estimates of biological

reference points which account for the effects of v-notching and maximum size limits, and improved the length-based cohort assessment technique to incorporate the molt-probability growth model and the actual cyclic pattern of landings through the year.

For the purposes of the modified DeLury analysis, trawl survey abundance indices were developed for two size categories of lobsters: (1) fully recruited individuals with carapace lengths equal to or larger than the minimum size limit, and (2) a pre-recruit size class which includes all those lobsters which may be expected to molt to a size at least as large as the minimum carapace length during the 12-month period between the trawl surveys. In view of the differing growth rates between the three assessment areas, the pre-recruit size class may include those lobsters with carapace lengths ranging, at a minimum, from  $2 \frac{5}{8}$  inches to  $2 \frac{7}{8}$  inches, and at a maximum, just below the minimum size,  $3 \frac{1}{4}$  inches. Fully-recruited lobsters are all those with carapace lengths of  $3 \frac{1}{4}$  inches and larger.

In the Gulf of Maine assessment area, trawl survey abundance indices for both size groups increased throughout the late 1970's to the mid-1980's. Abundance declined between 1986 and 1988, and subsequently increased to time-series highs in 1990. Abundance has sharply decreased since 1990. The abundance of fully-recruited lobsters has varied without trend since the mid-1970's in the Georges Bank and Offshore assessment area. Conversely, the abundance of pre-recruits has increased steadily over the time period. In the South Cape Cod-Long Island assessment area, surveys by Rhode Island and Connecticut both indicate that abundance indices for both lobster size groups have increased since the early 1980's. There is conflicting evidence whether or not declines have occurred during 1991 and 1992.

The estimated level of fishing mortality in the Gulf of Maine assessment area for the period 1989-1991 was  $F = 0.65$ , and significantly has been steadily increasing at the rate of about 5.5 percent per year since 1983. This level of  $F$  is substantially higher than the most likely estimate of  $F_{max} = 0.29$ . The estimated level of  $F_{10\%}$  is 0.52, indicating that fishing mortality rates need to be reduced 20 percent, assuming no change in current management measures, to meet the overfishing definition.

For the Georges Bank and Offshore assessment area, the estimated level of fishing mortality for the period 1989-1991 ranged  $F = 0.17-0.36$ , depending upon assumptions regarding the relative selectivity of pre-recruits to the survey trawl. Fishing mortalities have apparently been declining since about 1985. Calculated biological reference points are  $F_{max} = 0.17$ , and  $F_{10\%} = 0.44$ , indicating that this segment of the resource may not be overfished according to the definition of overfishing, but is probably fully exploited.

In the South Cape Cod - Long Island assessment area, fishing mortality rates have been uniformly very high, ranging 1.12 - 1.59, without any significant trend over the period 1986-1991. The current (1989-1991) average was estimated at  $F = 1.47$ . The estimated level of  $F_{max} = 0.38$ , and  $F_{10\%}$  is 0.68, indicating that overfishing is occurring and that current fishing mortality rates need to be reduced to achieve management goals.

Past tagging data have indicated that significant interchange occurs seasonally between southern New England inshore populations and the offshore areas on the shelf and slope. These results suggest that some portion of the apparent level of fishing mortality in the inshore areas may be due to net emigration of larger lobsters to the offshore areas. Conversely, this effect might result in an underestimate of the true fishing mortality in the Georges Bank and Offshore assessment area. One of the recommendations for further research given in Section VIII.D.6. points out the need to resolve the question of stock identification, particularly as related to inshore/offshore components south of Georges Bank.

Notwithstanding some uncertainty with regard to the effects of lobster migrations, fishing mortality rates in the South Cape Cod - Long Island assessment area are too high and need to be reduced about 50 percent, assuming no change in current management measures, to meet the overfishing definition.

Since overfishing is occurring in both the Gulf of Maine assessment area (which accounts for about 71 percent of the landings) and the South Cape Cod - Long Island assessment area (14 percent of the landings), while the Georges Bank and Offshore assessment area (15 percent of the landings) is at least fully exploited, the aggregate resource is determined to exceed the reference overfishing level and is currently in an overfished condition.

### **3. Relationship to Other Species.**

The carnivorous habits of lobster larvae and postlarvae result in their almost exclusive dependence upon zooplankton during their first year (Lavalli 1988). In larval stomach analyses performed by Juinio and Cobb (1992), nine taxonomic prey groups were found. Copepods and decapod larvae are common prey items but cladocerans, fish eggs, nematodes and diatoms have been noted.

Adult lobster are omnivorous, feeding largely on crabs, molluscs, polychaetes, sea urchins, and sea stars (Ennis 1973; Carter and Steele 1982a,b; Weiss 1970). Fish and macroalgae are also part of the natural diet. Lobster are opportunistic feeders so their diet may vary regionally depending upon the abundance of prey species.

Lobster are in turn preyed upon by bottom or reef inhabiting species, including teleost fish, sharks, rays, skates, octopuses, and crabs (Philips *et al.* 1980). Larval and postlarval lobster are subject to heavy predation. Even after settlement they are vulnerable to mud crabs, cunner, and an array of other bottom feeding finfish species depending upon prevailing habitat type and suitable shelter. When not burrowbound, the foraging early benthic phase and larger juvenile lobsters are prey for sculpin, cunner, tautog, black sea bass, and sea raven (Cooper and Uzmann (1977), Atlantic cod, wolffish, goosefish, tilefish, and several species of sharks consume lobsters up to 100 mm CL (Cooper and Uzmann 1977; Herrick 1909). It has been suggested that large, hard-shelled lobster are immune to predation (Herrick 1909). Nevertheless, man is probably the most effective predator on this species.

## **D. HUMAN ACTIVITIES**

### **I. Description of the Lobster Fishery.**

**a. History of the fishery.** Commercial lobster fishing goes back to pre-Revolutionary days, but expanded rapidly during the latter half of the 19th century. In 1880 total landings in the United States were 9,208 MT. By the turn of the century, Maine had become the leading lobster-producing state. A lobster canning industry existed in Maine from about 1840 until 1895 when Maine adopted a law which prohibited the taking of lobsters less than 10.5 inches in total length (about 2.9 inches carapace length). This law was adopted because the live lobster industry persuasively lobbied for it, claiming that it was needed in order for the industry to get the highest price for its product. After its passage canners could no longer compete with live lobster dealers because they could not afford to pay for lobsters large enough to be sold on the live market. Although the live lobster industry may have argued for the 1895 minimum size increase as a conservation measure, the law was adopted for economic and political reasons rather than for its value as a conservation measure.

The fishery has predominately been conducted with traps. Although the fishery fluctuated the first half of this century, the number of traps being fished remained fairly constant from 250,000 to 300,000. However, in the post World War II era, and particularly the 20 year period from the late 1950's to the late 1970's, the fishery expanded rapidly. The number of traps fished in the inshore fishery reached a record high of about 2.2 million in 1990.

In addition, a new fishery developed offshore. Although offshore trawlers were known to harvest some lobsters in earlier times, the fishery remained essentially a shoal-water, coastal trap fishery well into the 1950's. Increased demand for lobster and improvement in the technology of mobile gear stimulated rapid development of an otter trawl fishery for lobster, principally around the canyon areas located in deep water along the continental margin off Southern New England. Reported landings of trawl-caught lobsters grew from 128 MT to 2,500 MT between 1950 and 1965. The new fishery rapidly expanded to an offshore area ranging from Corsair Canyon on the eastern margin of Georges Bank to Norfolk Canyon off the Virginia coast. However, after peaking at almost 3,200 MT in 1970, the trawl landings declined to about 600 MT in 1976, as effort was shifted to the offshore trap fishery.

Success of the offshore trawl fishery and the advent of the hydraulic trap haulers during the 1960's stimulated the development of deep water trap fishing technology. During the late 1960's the deep water trap fishery expanded rapidly, but in the early 1970's, serious economic problems were experienced from initial overcapitalization and from gear conflicts, principally with distant water trawl fleets. During the mid-1970's, the deep water trap fishery extended across the continental shelf in the area from Massachusetts to New Jersey and along the shelf edge from Lydonia Canyon to Norfolk Canyon. Annual total landings from the offshore fishery fluctuated between 2,000 MT and 4,000 MT through the mid-1980's, peaking at 5,000

MT in 1990.

Inshore and offshore landings of American lobster. (1,000 MT)

	1983	1984	1985	1986	1987	1988	1989	1990	1991
Offshore	2.4	4.2	2.6	3.4	3.3	3.0	3.3	5.0	4.7
Inshore	17.6	16.4	18.0	17.8	17.3	19.2	20.7	22.6	24.0

Source: NOAA/NMFS, 1992.

**b. Recreational fishery.** Information on the number of recreational lobster fishermen is available only for New Hampshire, Massachusetts, Rhode Island, Connecticut and New York, states in which a license is required to fish lobsters for recreational purposes. Recreational fisheries are conducted with a number of techniques, which include traps and diving with SCUBA equipment. While diving for lobsters is prohibited in Maine and New Hampshire, it can be an important component of the fishery in other areas. In Maine, where a license is required to fish lobsters for any purpose, all licensed lobster fishermen are classified as "commercial". However, a number of those fishermen are known to fish for lobsters only for recreational purposes. Recreational lobster fishing occurs in New Jersey, but its importance is not known, since the state does not currently issue licenses except for pot gear.

It is unlikely that a recreational trap fishery of any magnitude exists beyond three miles from shore. Similarly, recreational fisheries in areas south of New Jersey are unlikely due to a low availability of lobsters in the near shore waters of the states concerned.

**c. Commercial fishery.** Landings have risen steadily from 1970 reaching a record high of 29,089 metric tons (almost 66 million pounds) in 1991 (Table VI.1.). Fishing effort has shown a similar trend. Numbers of lobster pots in the trap fishery exceeded one million for the first time in 1969, rising steadily to over three million in 1984. No significant trend in numbers of traps has been observed in more recent years, although total effort reached a record level of 3.2 million traps in 1990 (Table VI.1.). Catch rate data are more difficult to interpret because of the influences by temperature, seasonal effort patterns, and the frequency with which traps are hauled. However, there has been observed a relatively continuous increase in landings per trap since the mid-1980's, an observation which is consistent with the most recent assessment information which indicates that populations (particularly in the Gulf of Maine) have been increasing over a similar time period. This evidence suggests that levels of effort (numbers of traps) are unlikely to decline and may exhibit further increases in the future.

The increase in commercial landings and effort is a manifestation of the trap fishery.

Other gear types do not exhibit similar increases. The offshore lobster fishery using otter trawls has been in decline from a record high of 3,196 metric tons (7 million pounds) in 1970 to an average of about 560 metric tons (1.2 million pounds) for the period, 1988-1992 (Table IX.B.4.). This trend might be reversed if restrictions on fishing effort and landings in the New England groundfish (Multispecies), Atlantic sea scallop, and summer flounder fisheries cause otter trawl vessels to redirect fishing effort to the lobster fishery.

Table VIII.D.1. Total landings and value (unadjusted) of American lobster by state in selected years.

State	1979		1986		1991	
	Pounds (1,000)	Value (\$1,000)	Pounds (1,000)	Value (\$1,000)	Pounds (1,000)	Value (\$1,000)
ME	22,133	39,901	19,704	46,171	30,789	72,265
NH	780	1,362	NA	NA	1,800	4,900
MA	9,553	19,804	14,470	36,873	15,900	43,643
RI	2,289	5,138	5,514	16,218	6,580	18,184
CT	808	2,068	1,668	NA	2,600	8,100
NY	703	1,852	1,407	4,114	2,695	7,699
NJ	805	1,727	1,123	3,446	1,673	5,382
DE	36	113	NA	NA	100	300
MD	93	238	58	197	26	106
VA	1	1	1	3	1	1

#### d. Processing, Marketing and Consumption.

Processing By far the largest portion, approximately 87 percent, of the domestic catch of American lobster is marketed live or freshly cooked at the point of final sale. The remaining portion is marketed as fresh or frozen meat which has been shucked from lobsters which become weakened or injured at various points in the distribution chain. In addition, in the Mid-Atlantic region, some lobster is marketed as lobster parts. Only a small proportion of the lobster industry does any type of processing. Beginning in 1990, however, a number of firms, principally in Maine, began production of frozen whole lobster and tails. At the same time, there was a large increase in the exports of lobster from New England to Atlantic Canada for the purpose of freezing. Previously, the only frozen lobster on the market was the very small lobsters from the Gulf of St. Lawrence region. The new product originating in Maine and from some firms in Atlantic Canada uses "market" sized lobsters and is intended to compete with the larger, "serving sized", frozen langostino or spiny lobster tails.

Distribution Although the number of steps in the distribution chain is variable by geographic region, in general the individual fisherman sells his catch to a dealer, who will

hold the lobster for sale to a wholesaler. These wholesalers in turn market the lobster either to restaurants, retail outlets or institutions.

In areas such as Maine, where the coastline is marked with many protected embayments subject to tidal flushing, tidal impoundments as well as floating "lobster cars" are used to store live lobsters until they are distributed to dealers or wholesalers. A more recent and more common storage method, both for the producers and dealers at various points on the chain of distribution, is the use of circulating sea water tanks which may, depending on the climate and region, be temperature controlled

The tidal impoundments, or lobster pounds, serve a number of purposes, depending on both the current market for lobster and the season. At times, pounds are used for extended storage of lobsters, either to allow recently molted lobsters to harden their shells, or to serve to level the market in periods of slack supply or demand. A number of large storage facilities serve a speculative purpose, holding lobster in expectation of price advances. Some pounds may have recently begun to hold lobster through molt periods when the weight and value can increase significantly. Because lobster catch is dependent on the season, pounds are used primarily to maintain a steady supply in the face of variable production rates. Lobster cars and tanks serve as short-term storage facilities and for holding of daily shipments to market. An intensive two-way trade with Canada also is essential to the industry's ability to provide steady supplies to the market. This trade involves the importation of Canadian lobsters at times when U.S. supplies are weak (regulated Canadian seasons are set so that Canadian landings occur when U.S. landings are low) and the export of U.S. lobsters (for pounding and freezing) in the fall when U.S. supplies are strong. In addition, there is an almost continuous (non-seasonal) export of lobster from the U.S. to Canada via the major distribution centers around Boston and New York. For all practical purposes, there is a single North American lobster market that is restrained by national boundaries only in-so-far as seasons and differences in the legal size of lobster require.

Bulk lobster shipments are transported by truck and by air, in specially constructed insulated packages made of fiberboard or Styrofoam. Express air or postal delivery shipment of small quantities by order to individual consumers is a common method of sale. In addition, seasonal sales by supermarkets in the U.S. and Europe are often accompanied by airfreight shipments of up to 70,000 lbs.

Prices The apparent value of the lobster catch has increased steadily in recent years. In 1991 the value to the fishermen of domestic commercial landings was \$165 million, up from \$86.5 million in 1981 and \$33.5 million in 1970. The average ex-vessel, or price per pound received by fishermen for their catch has increased from \$2.31 in 1981 to \$2.61 in 1991. However, if the trend in ex-vessel prices of lobster is compared to other prices, it becomes apparent that increases in lobster prices have not risen as much as the prices of other fishery products. For example, from 1983 to 1991 the general fish price index (ex-vessel) rose 13.7 percent, whereas the ex-vessel lobster price index increased by only 7.6

percent (NOAA/NMFS, 1991)

Vessel prices fluctuate seasonally, from a low in early fall to a high in mid-winter when fewer lobsters are taken and holiday season demand is high. Prices fall again in mid-April as domestic landings pick up from the winter slump and supply is augmented with imports from Canada.

Different sized lobsters command different prices per pound at the market, depending on the season and demand. The smallest legal sized lobsters, known as chickens and weighing about one pound, are generally the least valuable per pound next to culls or damaged lobsters, though occasionally demand for them has driven their price above that for other categories. Prices increase with the size of the lobster until a threshold size, about three pounds, is reached. Above this size, the lobster is too large for the general restaurant trade, and the price per pound decreases somewhat due to depressed demand.

Wholesale prices have generally been 40 percent higher than ex-vessel prices, and tend to move up and down very closely with ex-vessel prices. Because a major portion of the lobster sold is served by restaurants and other institutions, the retail market and retail price are difficult to evaluate. Institutions and restaurants require generally stable or predictable supplies of lobster, which makes the quantity remaining for retail sale very sensitive to changes in landings. Thus, the retail price and availability can be highly variable, depending on fluctuations in supply.

In addition, retail prices for the live product may vary widely depending upon both season and geographic region. While lobster can be purchased by consumers at near ex-vessel prices from lobstermen in the producing coastal areas, the price in other parts of the country or in retail establishments is often several times higher.

Processed lobster prices reflect the considerable loss which occurs from live weight to meat weight of lobsters. Hard shell lobsters will yield approximately 20 percent of their weight in meat. Molted lobsters will yield only about 12.5 percent of edible meat. Fresh cooked meat may be worth more than 18 dollars per pound. In contrast, canned and prepared products containing relatively small quantities of meat processed from cull or damaged lobsters may sell for prices below two dollars per pound.

Product distribution The distribution chain for American lobster consists of several steps. The lobsterman sells his catch to a dealer or buyer. The dealer then sells his stock to a wholesaler. Dealers often function as wholesalers. Wholesalers and brokers market their stock either to retail outlets or to restaurants. Lobster cooperatives frequently operate as dealer-wholesalers, eliminating outside middlemen. Because few alternative outlets exist for many lobstermen, the wholesaler frequently has the ability to make the market. Wholesale prices tend to reflect differences in handling and transportation costs between the major markets but are otherwise equalized. Because lobstermen must often deal with only one local

wholesaler-dealer, and because firms at this level frequently augment their sales with imported product and maintain storage of lobsters for speculation, the wholesalers' operation has potential to be very profitable.

Markets The lobster industry is characterized by the small number of major sellers involved. Several large New England dealers control the marketing of a significant portion of the total available production.

Although in the past the Fulton Fish Market absorbed much of the Maine and Canadian production, by the early 1980's that situation had changed with an increase in direct air shipment of lobster from dealers and wholesalers. The Massachusetts catch is consumed primarily in local areas or utilized by the Boston market. The other coastal states, including Rhode Island, New Hampshire, Connecticut and New Jersey all produce less lobster than is consumed locally; thus they rely on supplies from Maine and Canada. Considerable quantities of American lobster are marketed as far south as Miami, and with the increasing use of air transport, live American lobsters are becoming less of a rarity in the inland and west coast states. However, the New England and New York markets continue to provide the largest regional outlet. Recent marketing research and trends are looking to sell lobsters in the opening markets overseas.

Imports Domestic production is not sufficient to supply the great demand for American lobster in the United States, and a substantial proportion of the lobster consumed here is imported from Canada. In 1990, the United States imported 32.9 million pounds of live lobster from Canada which was 53.9 percent of the total U.S. landings for that year (NOAA/NMFS, 1991). The amount of lobster imported from Canada has increased over the years from the 13.5 million pounds imported in 1981 to 32.9 million pounds imported in 1991. In 1988 the United States imported 69 percent of the total value of Canadian exports (DFO, 1990). It is obvious from the available information that a substantial portion of U.S. lobster supply is of Canadian origin and the U.S. imports the largest share of Canadian lobster production.

Role of Cooperatives Cooperatives play a very significant role in the processing and marketing of lobsters. For example, there are eighteen fishery cooperatives in the State of Maine, and virtually all deal in some aspect (marketing, purchase of supplies, processing) of the lobster fishery. Cooperatives are also very important in the lobster fisheries in Rhode Island and Massachusetts.

#### **e. Social - Cultural Description of the Fishery.**

The lobster fishing industry is dominated by fishermen who have a wide range of fishing experience in lobstering and other commercial fisheries. Some lobstermen fish only for lobsters, mainly because their operations make it difficult to fish other species. The vast majority of lobstermen, however, regularly switch fishing activities to other species of fish.

In fact, some fishermen regularly switch fisheries on a seasonal basis.

An understanding of the factors affecting the shifting between fisheries is important in the effort to effectively and efficiently regulate the use of the resource. Both regulations and economic forces have an effect on fishing patterns. In some cases restricting fishing on one species merely means increasing effort on another. The degree to which species switching occurs depends on the ability and willingness of fishermen to switch species and their availability to appropriate gear.

By reviewing observed data on gear switches that occurred between lobster fishing and other fisheries in Maine and New Hampshire in the late 1970's and early 1980's, the social, cultural, and economic relationships between lobster fishing and other species fishing can be discerned. From this review, effects and impacts of various management measures can be assessed.

Two other social or cultural aspects of the lobster industry are also important in the assessment of regulatory impacts on the fishery. The lobster industry has evolved into a highly self-organized and self-governed common resource industry. Lobster fishermen are, culturally, very important to the home port and coastal region in which they land their catch. The development of the sub-local lobster culture within coastal communities has resulted in an highly organized, albeit informal, self-governance of the resource by individual lobstermen. This self-governance takes form through territoriality and harbor-specific social units.

Species (Gear) Switching During the late 1970's and early 1980's, the total New England fishing fleet was expanding. There were more commercial trawlers, purse seiners, gill netters and sardine carriers operating from Maine and New Hampshire ports than there were in 1970. In addition, these boats were clearly larger, better equipped, and had more versatile fishing gear (Acheson, 1989).

During this time period, there was a general shift out of lobstering and into other kinds of fishing--especially groundfishing with gill nets and otter trawls. Economics played a large role in this species switching. Revenues to fishermen was relatively stable at this time, but their costs had increased dramatically. During this time, lobster catches hovered around 20 million pounds; and prices paid for lobsters rose slowly. However, as a result of the Arab oil embargo, there was a sharp rise in the costs of gas and the costs of traps, bait and boat prices went up appreciably. In 1983, fishermen had no more purchasing power than they had in 1974. Some were experiencing a decline in real income. At the same time, net revenues to the groundfishing industry had increased dramatically due to large increases in both the size and value of the groundfish catch (Acheson 1988).

Economic factors also underlie the switch from dredging for scallops in the winter and lobster in the summer/fall to groundfishing. After 1980, when the scallop beds in the eastern part of Maine were being depleted scallops proved to be a unstable source of income. These

fishermen then found themselves switching between lobstering and scallops, which were both faltering industries. Thus, these men were entering groundfishing which, at that time, was a more profitable industry.

Some of the men who left lobster fishing adopted gill nets and others went into otter trawls. The men who adopted otter trawls had a good deal more invested in their fishing businesses. Otter trawling requires much larger vessels whereas gillnetting can be done from relatively small boats. In addition, the men who adopted gill nets were generally older than those who adopted otter trawls and consequently had more years of experience in the fishery. This indicates that gill nets are an intermediary gear. Many of the men who adopted them wanted to switch out of the failing lobster industry for part or all of the year, but could not or were not willing to switch completely into other fisheries requiring far more capital and skill. These people were primarily lobster fishermen. They wanted to keep their lobster boats so they could switch into that fishery in the late summer and fall. Many of these fishermen were in their late 40's or 50's, who were past their prime and wanted to fish inshore so they could be home every night.

There is little evidence of entrants into fisheries from persons in non-fishing jobs becoming captains of boats whose primary gear was a bottom trawl, pair trawl, midwater trawl, or purse seine. When men purchased boats using those types of gears, they always had experience in the lobster fishery first and or extensive experience as crewmen on vessels using those kinds of gears. As in any other industry, success in fishing requires skill and experience. Pair trawls, midwater trawls, etc. require more investment and skill than other kinds of fishing. Men with no experience in fishing cannot go from a land based job into vessels fishing with pair trawls, beam trawls, or other groundfishing gear.

Thus, in-experienced people find it easier to enter lobster fishing; some then switch to fishing with large vessels offshore. Nine individuals interviewed, who made this switch began their careers in lobster fishing and then began to do some gillnetting. By 1973 gill nets had become the major type of gear these men used, although most of them were still involved in lobster fishing at some time in the annual cycle. By 1979 or 1980, these men had become full-time ground fishermen and had taken on larger boats equipped with bottom trawls. This latter switch involved much more investment in the fishery.

Information about older lobster fishermen (see Acheson 1989; 1979) demonstrate that a very high percentage have had experience in other fisheries. Some 28% of the lobster fishermen over the age of 60 have been captains of large vessels fishing for other species offshore. They are men who have turned to lobstering in their latter years in an effort to stay in the fishery, but avoid the very long hours and long separations that are characteristic of trip fishing offshore.

Two general conclusions can be made regarding species switching. First, the primary reason to change fisheries is economic. People change gears and target species in an effort

to get into a fishery with higher earning potential.

Second, skill is critically important in changing fisheries. People do not change into fisheries with which they have no experience. Usually people gain the experience necessary to enter another fishery by changing gears over the annual round. That is, they begin using a new type of gear for a few weeks or months and then gradually increase the proportion of time they use this type of gear. They may then purchase a larger and better equipped boat and use the new type of gear exclusively. Some kinds of gear demand very large vessels. One does not go pair trawling with a lobster boat. The only way that one can enter this industry is to hire on as a crewman on a boat that goes pair trawling.

Lobstering can be viewed as the "entry level" occupation for the entire fishing industry in New England. It is very common for men to begin fishing for lobsters from a small skiff as teenagers, and then become full time lobster fishermen after high school. This means they have to purchase an inboard powered boat and a larger gang of traps. Large numbers of fishermen fish for lobsters throughout their careers. However, a certain number of lobster fishermen turn to fishing for other species such as groundfish, scallops, etc. In one sample of captains of large vessels (i.e. beam trawlers, purse seiners, etc.) fully 87% had been lobster fishermen at some point in their careers. In old age, again there is a return to the lobster industry. Again, this is a day fishery, and one that allows people to fish on a part-time basis.

Social Organizations - Territoriality One of the most unique feature of the lobster industry is the system of territoriality that is very much in evidence in Maine, New Hampshire and the north shore area of Massachusetts. In northern New England in particular and along the entire lobster fishing coast, lobstermen have divided the inshore lobster fishing grounds into "territories". These lobster territories most often correspond to a particular harbor in which a group of lobstermen land their catch. These distinct social groups of lobstermen in the various ports along the New England coast have been coined "harbor gangs".

In order for a new lobster fishermen to begin lobstering the entrant needs to acquire a valid state or federal lobster license and be admitted into a harbor gang. Once a person has gained entry to a gang, he may only go fishing in the area of that gang. Each harbor where boats are moored ordinarily has its own harbor gang and lobster-fishing territory.

Close to shore, boundaries are precise and defined to the yard. Here boundaries are marked by geographical features on shore---a cove, or point of land, etc. Boundaries around offshore islands are marked in terms of the island itself or by reference to points on the mainland. Offshore, boundaries are less often defined.

The willingness to maintain territories is connected with the amount of competition for lobster bottom. In the summer, when the productive area is smaller, and the influx of part-timers results in intense competition, fishermen monitor their territorial rights very

closely. In the winter, when fishermen are placing traps offshore, there is less competition, boundaries are not defended so rigidly and thus a good deal of cross species fishing results.

Violation of boundaries meets with no set response. An older, highline fishermen from a well established family might get away with incursions for a long time. An unpopular person, a young person, or a relative newcomer might be sanctioned almost immediately. Violators of boundaries are usually warned, sometimes verbally, but most usually by minor molestation of their lobstering gear (i.e. taking the lobsters and leaving the doors open). If the boundary violation persists, the traps are destroyed--usually by "cutting off" the warp line and buoy and sinking the trap in deep water where it is difficult to find.

Periodically a group of people will cooperate to defend a territorial boundary, but usually trap cutting is done by one person acting alone. However, all trap cutting incidents are kept very quiet both to reduce the possibility of retaliation and the chances of losing one's lobstering license. Although small scale trap cutting incidents are well advertised and there is a well developed body of myth concerning "lobster wars", large scale trap cutting incidents are very rare. This characteristic underlines the fact that the rules and practices concerning territoriality are well understood and obeyed in the industry.

It needs to be noted, however, that the entire territorial system is technically illegal, since it means expropriating part of the public domain for the use of a group of people. Such territories are also defended by illegal means.

However, there is some evidence that the territorial system does have some beneficial results. The territorial system effects some ownership rights over a resource and the harbor gangs involved have an informal limited entry system. In those areas where entry is most restricted, lobsters are larger, there is a higher catch per unit of effort, and the numbers of berried lobsters is higher as well (Acheson 1975).

Harbor-Specific Organizations ("Harbor Gangs") Outside of the lobstermen's direct family, the most important people in a fishermen's life are the men who fish for lobsters from the same harbor. The existence of such groups is well known in fishing circles, but they have no agreed upon name. These groups have been called "harbor gangs" even though this term is rarely used by fishermen themselves.

Membership in harbor gangs has a strong influence on many important aspects of a lobsterman's career. Most importantly, it controls entry into the industry since people without membership in a gang have no where to fish. Gangs are important in other respects as well. People identify as members of gangs, and are identified as such. Members of gangs obtain a good deal of valuable information from each other concerning fishing locations, marketing and innovations. Gang members can be counted on to aid each other in times of emergency at sea.

In addition, harbor gangs are reference groups. One measures one's own success or failure with men of the harbor gang. A man is a "highliner" or "dub" only in the context of a harbor gang. One does not compare oneself with draggersmen or herring fishermen even though they might live next door.

Lobster fishermen from the same harbor gang ordinarily have multi-stranded ties with each other. Almost all live in the town where the harbor is located. Many are members of long-established families. Many have grown up together, and members of their families have known one another and intermarried for generations. The further south one goes in New England, the more likely that lobster gangs will contain more people who have only recently arrived to the region and to the occupation. But even in Connecticut ports, there are numbers of fishermen whose families have been in fishing for more than a single generation.

The amount of interaction among gang members varies considerably. Some members are quite solitary, while others spend many hours each day hanging around the wharves talking to each other. Some dealers provide a place for their fishermen to sit, talk, and drink coffee. Interaction between gang members can be quite minimal. In Maine the convoluted coastline makes it difficult for people from harbors in the same region of the coast to visit easily. Under these conditions, "gang" sub-cultures and identities have a chance to flourish (Acheson 1988).

Entry into harbor gangs is complicated. Anyone seeking to go lobstering experiences a certain degree of hostility from established fishermen who understandably do not want to share their territory and reserve of lobsters with another fishermen. New fishermen normally have some traps molested for the first few months. Some fishermen have said that this amounts to almost an initiation. However, some would-be entrants never are accepted, and others have considerable difficulty. The amount of resistance a person meets depends on their own personal traits, the area he is attempting to enter, and the amount of income they obtain from fishing.

A local boy has relatively little difficulty entering a harbor gang. This is particularly true if his close relatives are members of the gang, if he has grown up in town, or if he begins fishing at an early age and expands his operation gradually. Entry into the industry is most difficult for a person from outside of the community or state with no connections to the industry, who begins fishing a large gang of traps, and has another source of income (Acheson 1979). Generally, It is much easier to enter gangs on the mainland. Harbor gangs on some of the island--especially privately owned islands--assume fishing rights are reserved for the members of the island community or island-owning family (Acheson 1979).

In all cases, a part-time fishermen will have more difficulty gaining acceptance than a man who wants to go fishing full time, even though the full time fisherman will undoubtedly catch more lobsters. This hostility stems from a feeling that people with one job should not be taking lobsters from those who depend on the industry for their sole support, and the fact

that the part time fishermen do not know the rules of the industry well. Indeed, few of the part-timers have the opportunity to learn "the lobster game" in a normal way. Most full time fishermen from lobstering families serve a stint as a "sternman" for their father or someone else. This gives them the opportunity to learn the techniques and sub-culture of lobster fishing.

Few part time fishermen have been sternmen for any length of time. Part-timers tend to learn on their own. Some novice part time fishermen simply follow more experience fishermen and dump traps in the same places, which results in gear tangles. They are also thought to have a cavalier attitude toward other men's traps and have been known to open them on occasion to see what experienced fishermen are catching. The dislike of part-time fishermen is exacerbated by the fact that they cannot be sanctioned except at great risk because they have so little to lose and another job.

In Maine, people from old established families like to say that lobstering is reserved for people like themselves--those with a history in the area. But lobstering is not a closed industry. Though residence and membership in established families play a role, not all lobstermen are from fishing families, and many persistent newcomers have entered the industry.

Two factors appear to be of critical importance in influencing entry into harbor gangs. If a boy begins fishing from a skiff in grade school or high school, and goes to school in the town, he is likely to have little difficulty. Second, people who are known to molest other people's gear tend to not last long in the fishing business. Part-timers and other who have not gone through the normal acculturation process are apt to make up a high percentage of people who have had trouble on this score.

Industry participation in resource management The lobster industry is highly regulated. Lobster fishermen must have a state license; they are required to mark their traps a gear with their license number; they must mark their buoys with a color combination registered with the State. Their traps must have an escape vent. Lobstermen must obey the minimum size regulations (3 1/4 inches on the carapace); and in Maine they must not take lobsters over 5 inches on the carapace. In addition, they are forbidden to take lobsters with eggs on them.

Fishermen generally obey these rules. To be sure, some oversized males and some shorts are taken home for family consumption, but compliance with these laws is high ---especially in view of the fact that there are few fish wardens. Moreover, fishermen who violate the law repeatedly are sometimes severely sanctioned by other fishermen themselves.

Lobstermen have been very effective in influencing legislation to regulate their industry. This is not to suggest that the fisheries bureaucracy has no effect on regulations or that fishermen control the process completely. But it is fair to say that real changes in the regulatory environment have come about when large numbers of people in the industry have

reached a consensus and have communicated their wishes to the legislature. Conversely, when the fishermen massively oppose a bill, it is often defeated. The history of lobster regulation in Maine in the past 20 years gives some insight into the processes involved. In the mid 1970's, there were no attempts to introduce legislation to change the legal size limits since there was no support in the industry for such legislation. One bill was introduced into the State Legislature to limit traps and licenses, but it was defeated by groups of well organized fishermen, who hired a very effective lobbyist.

In 1986-87, a study was done on the attitudes towards management proposals. This study showed that in the 1980's fishermen were more inclined to management than they were in the mid 1970's (Acheson 1975b). The change was due to a severe cost/price squeeze which was gripping the industry. Virtually all fishermen agreed that there were too many traps in the water and too many fishermen. Many favored some kind of limited entry program and a limited number of traps. In addition, the fishermen almost unanimously said they would approve of a law requiring escape vents on traps to allow undersized lobsters to escape. Most of the fishermen interviewed said they favored retention of the five-inch law, but opinion was severely divided on the question of raising the legal minimum size to  $3\frac{5}{16}$  inches. None of the fishermen said they wanted to see the "notched tail" law abolished because they regarded it as the most important and effective conservation regulation--one that ensured that millions of breeding females are returned to the water and survive so they can breed again.

Throughout the late 1970's and 1980's federal and state agencies continued their efforts to have enacted a federal fisheries management plan that would increase the minimum size of lobster in 1/32 inch increments over a period of five years to a minimum limit of  $3\frac{5}{16}$  inches and abolish the V-notch law and the five inch oversize measure. Lobster fishermen, however, opposed these measures. The regulations that have been passed are the results of political pressure by all of the interested parties. In 1984, a bill was passed in the Maine legislature requiring vents on all traps. It was approved with minimum difficulty since it has substantial support in both the bureaucracy and the industry.

In the spring of 1986, bills were presented in the Maine legislature to increase the legal minimum size measure, abolish the 5 inch maximum size measure, and introduce trap limits for various classes of licenses. Intense lobbying efforts by fishermen and industry leaders persuaded the legislature to postpone action on all of these matters until the next legislative session.

In an effort to come to grips with federal fisheries management plans, the Maine Lobstermen's Association, proposed an unusual compromise. The lobster industry would support an increase in the minimum size measure, which many thought was unnecessary, if the Federal and State governments maintained the 5 inch oversize measure and the "notched-tail law, which the government scientists and administrators wanted to abolish. The Maine legislature passed a bill that went into effect in 1988 incorporating all features of this compromise plan. It included not only rules which the biologists and managers

thought were important, but those regulations which fishermen thought were important for the well being of their industry.

There is additional evidence of the concern that fishermen have for the future well being of their industry. They have proven to be very good collectors of valuable data on research projects concerning fisheries management. In 1974, 14 lobster fishermen were asked to record detailed data on sizes, and numbers of lobsters caught in some 10,000 lobster traps and the location of those traps (Acheson 1975a).

#### **f. Other Management Programs**

International Fisheries Program The American lobster has never been directly managed under international agreement. Prior to enactment of the Magnuson Act, many fisheries outside the jurisdiction of the United States (12 miles at that time) were managed under the auspices of the International Commission of Northwest Atlantic Fisheries (ICNAF). That organization established management policies and allocated harvests among member nations, but implementation and enforcement were left to the member nations. American lobsters, however, were managed by the United States rather than ICNAF, since they were declared to be "creatures of the continental shelf". The Canadian lobster fishery is managed by the Department of Fisheries and Oceans (DFO). There is no official coordinated management effort between the DFO and the NEFMC. By and large, however, Canadian and U.S. management of the fishery is conducted with harmonious regulations. In addition, to rules comparable to those in use in the U.S. (minimum size, etc.) Canada imposes a system of regional closures and limits the number of lobster licenses.

Federal Fishery Management Plans Fisheries for groundfish (cod, haddock and yellowtail flounder), Atlantic herring, scallops, surf clams and ocean quahogs, squid, mackerel and butterfish are currently under regulation by other fishery management plans. Fishermen fishing for lobsters are subject to these other plans if their activities are likely to result in the harvest of any of these other species. Similarly, fishing for any of these other species may subject a fisherman to the provisions of this plan if his activities are likely to result in the harvest of lobsters.

State Fisheries Programs Most of the fishery for the American lobster in the United States occurs within state waters. Historically, each state has managed its lobster fishery independent from other states, although the need for a compatible management programs has long been recognized. Table VIII.D.2. presents a comparison of current State regulations.

The major State lobster regulations include: license requirements, catch/effort reporting, gear regulations, and fishing activity regulations, restricting the taking of berried lobsters and restrictions on the size of lobsters that can be taken. The last two of these are universally in force among the lobster-producing states.

Two measures implemented and enforced by the state of Maine should be noted in particular. In addition to the minimum size, Maine enforces a maximum size limit of 5". No other state maintains this regulation. Maine also operates a V-notching program. Fishermen voluntarily cut a notch in the tail of each berried female lobster, before returning it to the water.

The state also purchases berried females from pounds and returns them to the sea after notching them. It is unlawful in Maine to possess a lobster with a notch in the tail. The notch stays with the lobster through two molting cycles. Although the conservation benefit of these measures is neither proven nor disproved, they are widely accepted by the Maine fishermen as having a conservation value.

Both New Hampshire and Massachusetts, at various times in the past, had similar V-notch programs and both abolished them. One of the arguments against V-notching has been that notched lobsters may fall victim to gaffkemia and other infections and die. These concerns stem from studies in lobster pounds where population density is great and where water movement is possibly restricted, leading to generally higher incidence of diseases. It is worth noting that research indicated that new integument forms very quickly over the edges of the cut tissue and that unless infection sets in before the integument forms, likelihood of death from infection decreases to the otherwise usual level. No adequate studies of infection in natural ocean surroundings have been done.

Amendment 2 to the FMP prohibited the possession of v-notched lobster in the EEZ but, to date, only Maine prohibits the landing of v-notched lobsters.

Over the years, there have been attempts to coordinate management practices between states through informal cooperative agreements, but they have met with only limited success.

Table VIII.D.2. Lobster regulations by state.

	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC
<b>License Requirements</b>											
None Required									X		X
Required to Fish Lobster	X	X	X	X	X	X	X	X		X	
Required to Land Lobster	X	X	X	X	X	X				X	
Required to Deal Lobster	X	X	X	X	X						
<b>Legal Provision for Aquaculture Firms</b>		X	X	X	X	X	X				
<b>Fisherman Classification</b>											
None									X	X	X
Commercial	X	X	X	X	X	X	X	X			
Recreational		X	X	X	X	X	X	X			
<b>Catch/Effort Reporting</b>											
Not Required							X		X	X	X
Annual Reporting		X	X	X	X	X		X			
Daily Reporting					X						
<b>Gear Regulations</b>											
By License Class		X	X	X	X	X				X	
quantity	X	X	X			X		X			
type	X	X	X		X	X		X			
Owner I.D. Required	X	X	X	X	X	X		X			
Escape Vents Required	X	X	X	X	X	X	X	X	X		X
Degradable Escape Panel Required		X	X	X		X					
<b>Fishing Regulations</b>											
By License Class or Method			X	X		X		X			
number of licenses			X								
catch quotas						X		X			
area	X	X	X			X					
season	X		X					X			
day or time of day	X	X	X	X	X			X			
<b>Prohibited Activity</b>											
landing berried females	X	X	X	X	X	X	X	X	X	X	X
landing v-notch lobsters	X	X									
landing lobster parts	X	X	X	X	X	X		X	X	X	X
<b>Regulated Activity</b>											
landing lobster meat	X	X	X	X	X	X		X		X	X
landing lobster parts						X	X		X	X	X
minimum size of 3¼ inches	X	X	X	X	X	X	*	*	*	*	*
maximum size of 5 inches	X										

X Implemented or approved  
\* Under consideration

Since 1972, the lobster-producing states of Maine through North Carolina and the National Marine Fisheries Service have cooperated under the auspices of the NMFS State/Federal Fishery Management Program to provide a uniform approach to management of the lobster fishery. All participants agreed to work toward implementation of common precepts that were developed under the program.

The initial effort of the State/Federal program was to move towards a minimum carapace size of  $3 \frac{3}{16}$  inches. In the development of Amendment 4, however, it became apparent that industry favored limiting the minimum carapace size to no more than  $3 \frac{1}{4}$  inches. Amendment 4 instituted this size limit to increase uniformity between the FMP and the individual states' size limits. Currently all the major lobster producing states, Maine through New York, match this limit. The measure is under consideration, but not yet implemented in New Jersey, Maryland, Virginia, and North Carolina. New Jersey allows the landing of lobster parts which meet certain size criteria. New York also allows the landing of detached tails which correspond to the  $3 \frac{3}{16}$  inch minimum size requirement.

## **2. Anthropogenic Impacts on Lobsters and Their Habitat.**

Human activities can have a significant impact on the lobster resource and its environment. Siltation and turbidity from deforestation, poor agricultural practices, urban development, quarrying, dredging, construction, or oil drilling can destroy lobster habitat and adversely affect larval growth, development, and survival (Aiken and Waddy 1986; Harding 1992). Ocean dumping can affect bathymetry, sediment grain size, and trace element concentration disturbing benthic biota and population structure (Aiken and Waddy 1986). The disposal of soft sediments from harbor dredging can directly impact lobster habitat and disrupt food resources; however, the dumping of coarse, uncontaminated material may enhance lobster habitat once it is colonized with prey organisms (Harding 1992).

For over 60 years (1924-1986) a marine dump site off New York in the New York Bight apex (12-mile site) received an annual average of 8 million metric tons of sewage sludge from sewer districts in the New York/New Jersey area. This location, at the head of Hudson Canyon, has been noted for its heavy metal contamination, high fecal coliform counts, black ooze substrate, and anoxic layer of bottom water. The area has been largely devoid of fishing practices. Elevated incidence of shell disease and black gill disease was observed in crustaceans collected at this site.

Since dumping at the 12-mile site ended in 1987, followed by a shift to a deepwater, 106-mile site, studies have shown some improvement in contaminant levels, bacterial counts, and in the low dissolved oxygen readings which previously characterized the area. However, shortly after dumping began in the 106-mile site reports were made by offshore fishermen of a high rate of shell disease in lobsters and rock crabs in that area and a concurrent decline in landings. As a result, a joint NOAA/EPA Working Group met between 1988 and 1989 to assess if a relationship existed between shell disease prevalence and crustacean population

fluctuations, determine if shell disease is pollution-related, and if shell disease results in mortality (Sindermann *et al.* 1989). The conclusions were that mortalities from shell disease have been observed in laboratory or impounded situations. Shell disease may pre-dispose crustaceans to predation or disease-related mortality, but there is no conclusive evidence that shell disease causes fluctuations in crustacean populations in the New York Bight apex. Evidence has been published that shows an association between habitat degradation and shell disease, however, there was no conclusive evidence to associate shell disease in offshore populations with sludge dumping at the 106-mile site. Subsequent studies conducted in the 12-mile site have been unable to conclude, due to highly variable data, if improvements in shell disease prevalence have occurred since the sludge dumping was suspended.

The construction of the Canso Causeway in Nova Scotia is believed to have interfered with larval distribution patterns and stopped larval lobster recruitment to the Atlantic coast from St. Georges Bay in the southern Gulf of St. Lawrence. A long-term population decline precipitated leading to the conclusion that bridges or tunnels are preferable alternatives to causeways (Harding 1992).

Thermal patterns may be altered by effluents from municipalities, industrial plants, and power plants resulting in local effects on larval survival, growth, and development (Harding 1992; Sastry 1980).

Lobster resources adjacent to industrialized areas are exposed to a number of pollutants. Embryos and larvae are very sensitive to contaminants. Connor (1972) estimated that larvae are 14-1000 times more susceptible than adults. The deleterious effects of petroleum products, industrial chemicals, and heavy metals are well published and include reduced survival, growth, molt inhibition, regeneration, malformation, and changes in metabolism, energetics, and behavior (Aiken and Waddy 1986).

Lobsters are highly sensitive to certain pollutants, particularly pesticides. Organochlorines (DDT, PCDD, Endosulfan, Endrin, Dieldrin, Chlordane), pyrethroid pesticides (Permethrin, Cypermethrin, and Fenvalerate) and organophosphate pesticides have very low lethal thresholds for lobster (Harding 1992).

Heavy metals such as copper, mercury, zinc, and lead are toxic at various concentrations. First stage lobster larvae are quite sensitive to heavy metals. Although mortality resulted from test exposures to all three metals, toxicity to mercury was the greatest for first stage larvae followed by copper, then cadmium. Exposure to higher concentrations of copper (56 vs. 30 mg/L) was necessary for a lethal effect on juveniles and adults; however, only sublethal effects were observed in juveniles from significant cadmium contamination while adults were not affected. Pollutants such as PCB's, may not have detrimental effects upon lobsters themselves but may render them unfit for human consumption. Large quantities of PCB's were discharged, by electrical component manufacturers, into New Bedford Harbor and the adjacent Acushnet River in Massachusetts over several decades (Weaver 1984). The harbor

sediments and biota still contain relatively large concentrations of PCB's which resulted in a significant segment of this estuarine system being closed to commercial lobstering.

Many studies have been conducted on the effects of crude oil on lobsters. Toxicity varies with the level of refinement of oil and the concentration to which the animals are exposed. For example, the more highly refined no. 2 fuel oil is more toxic than no. 6 oil. Responses to exposure range from mortality to sublethal effects of chemosensory interference or loss of coordination and equilibrium (Harding 1992). Larval forms are particularly sensitive since oil co-occurs in surface waters with them. Oil pollution also severely and negatively effects the small food organisms critical to larval lobsters. Larvae which were fed oil contaminated Artemia exhibited disruption in energetics (including reduced lipid levels), molting delays, reduction in respiration rate, slowed growth rate, and changes in the oxygen/nitrogen ratio (Capuzzo and Lancaster 1981; 1982; Capuzzo et al. 1984).

Oil pollution also effects lobsters in their adult stages. For example, laboratory studies have indicated that small quantities of crude oil can interfere with specific, perhaps chemosensory, behavior of lobsters. Feeding behavior has been shown in these studies to be affected, with the period between first noticing food and going after it being doubled. Because of changes in feeding and other behavior, it is possible that crude oil will interfere with the ability of male lobsters to detect sex pheromones released by female lobsters, which could severely interfere with reproductive activity.

Drilling muds also can be toxic at lethal and sublethal stages. Potentially lethal components of drilling muds include petroleum hydrocarbons, asphalts, aromatic lignosulphates, heavy metals and calcium-like cations such as barium and strontium. Observed reactions of lobsters to these include, depending on the concentrations, impaired coordination, cessation of feeding loss of mobility and death. Inhibition of burrowing behavior of Stages IV and V lobsters has been demonstrated. Drilling muds also affect habitat by their tendency to settle in depressions or flow downhill, a particular problem for lobsters whose natural habitat is offshore canyon areas.

Human impact on the American lobster resource has its greatest impact through commercial fishing practices. In most of the state's inshore lobster fisheries where over 80% of the lobsters are captured, more than 90% of those landed are new recruits. Cull lobsters (those with missing or regenerating claws) are attributed to anthropogenic as well as natural causes. An annual average of 16% of the marketable lobsters and 19% of sublegal lobsters sampled from commercial lobster trapping operations in Massachusetts coastal waters were culls (Estrella and Cadrin 1992). Inter- and intra-specific aggression in lobster traps, as well as handling by fishermen contribute to claw loss which may also occur in the wild as a result of not only territoriality but molting. The relative contribution of each potential cause is unknown. The regulation of escape vents in traps has helped to reduce in-trap aggression.

Mobile gear fisheries competing for lobster have been observed to contribute to lobster

shell damage and even mortality. Observations of fresh shell damage and claw loss were made when investigating the impact of bottom trawling off Duxbury Beach, Massachusetts (Estrella 1989). A strong relationship with molt stage was clearly defined. The prevalence of fresh shell damage in new-shelled lobster was consistent with the results reported by Ganz (1980) in Rhode Island waters and Smith and Howell (1987) in Long Island Sound. Although Spurr (1977) did not record molt stage of the lobster he studied off New Hampshire, he reported that the highest damage incidence occurred in July. This is when new-shelled lobster are expected to be abundant.

There is a high probability that delayed mortality will occur with new-shelled lobster which are damaged by trawling operations. Smith and Howell (1987) observed delayed mortality in 33.3% of the new-shelled lobster they tested. Similar results were found by Witherell and Howe (1989) who calculated 29.5% mortality.

Among potential trawl-induced injuries, other than death, claw loss significantly impacts market value. Krouse (1976) calculated that cull lobster weighed from 14 to 20 % less than fully clawed lobster. However, an overlooked impact of culling is its effect in reducing the growth rate due to the energy partitioning between molt and regeneration (Aiken 1980). This can delay recruitment to minimum commercial size, and, if maturity is more a function of age than size, as it is in the spiny lobster (Davis 1981), then the size at maturity will be lowered.

Claw loss can also affect lobster behavior. It is possible that since dominant lobster "claim" the optimal shelters, lobster which are behaviorally subordinate due to claw loss are forced to congregate on less optimal habitat, i.e. open sand or mud areas which lack structure. A number of lobstermen claim that there are areas which they refer to as "hospital grounds" where large numbers of culls can be found. This hypothesis needs to be investigated.

The impact of trawling on sandy habitat is negligible and of short-term duration (Estrella 1989; Spurr 1977). Graham (1955) and Gibbs *et al.* (1980) found no detectable changes in benthic fauna as a result of trawling in their sandy study areas. Smith and Stewart (1985) concluded that no longlasting impressions or habitat loss resulted from trawl door furrowing in soft mud bottom and only minor sediment disturbance (<1" depth) occurred in the sweep path.

Bridger (1970) stated that the nature and extent of marks in the substrate depends on the gear used and composition of the seabed. It should be emphasized that research results may differ on hard bottom areas. It seems logical that lobster vulnerability should not be as great on rough rocky substrate where boulders would prevent the sweep from riding close to the bottom. However, nocturnal vs. diurnal behavior may be important factors in lobster catchability. Smith and Stewart (1985) discussed the potential for greater lobster activity during daytime in dark deep water environments compared to lighter shoal areas.

Ideally, similar research should be conducted on all bottom types.

Ghost traps can be detrimental to the lobster resource and fishery. They have been estimated to continue to fish at a rate of 10% the effectiveness of a baited trap with 25% of the ghost trap lobsters dying (Pecci *et al.* 1978). This has been estimated to represent approximately 3% to 6% loss in annual landings in the U.S. (Harding 1992). Regulations addressing ghost fishing through a requirement of biodegradable escape panels or hinges are now in place in most states.

### **3. Description of Programs to Protect, Restore, Preserve, and Enhance Lobster Habitat.**

Federal marine pollution research and monitoring activities are coordinated by NOAA National Ocean Pollution Program Office. Short and long-term anthropogenic effects on the marine environment are also assessed. NOAA's Ocean Pollution Program Office coordinates interagency responsibilities while the Ocean Assessments Division (OAD) of the Office of Oceanography and Marine Assessments, National Ocean Service manages assessments.

**a. Federal and state programs.** The MFCMA provides for the conservation and management of living marine resources (which by definition includes habitat), principally within the EEZ, although there is concern for management throughout the range of the resource. The MFCMA also requires that a comprehensive program of fishery research be conducted to determine the impact of pollution on marine resources and how wetland and estuarine degradation affects abundance and availability of fish.

The MFCMA established Regional Fishery Management Councils that have the responsibility to prepare fishery management plans which address habitat requirements, describe potential threats to that habitat, and recommend measures to conserve those habitats critical to the survival and continued optimal production of the managed species. The NMFS Habitat Conservation Policy (*FR 48(228):53142 - 53147*), specifically Implementation Strategy 3, established the basis for a partnership between NMFS and the Councils to assess habitat issues pertaining to individually managed species.

Other NMFS programs relative to habitat conservation are found in the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, the Fish and Wildlife Coordination Act, the Federal Power Act, and the Anadromous Fish Conservation Act of 1965. NMFS shares responsibilities with the FWS for conservation programs under these laws.

In addition to the above mentioned NMFS authorities, other laws regulate activities in marine and estuarine waters and their shorelines. Section 10 of the River and Harbor Act of 1899 gives the Army Corps of Engineers (COE) authority to regulate construction in navigable waters of the U.S. Section 404 of the Clean Water Act of 1977 gives the COE and EPA authority to regulate the discharge of dredge and fill material into waters of the U.S.,

including wetlands. The COE and EPA jointly administer the 404 program. The EPA, in conjunction with the COE, developed the 404(b)(1) Guidelines which govern COE issuance of section 404 permits. The EPA has veto authority over COE permit decisions. Section 401 of the Clean Water Act gives the EPA or States with approved programs, authority to regulate any activity which may result in discharge into navigable waters. The EPA and COE each have regulatory responsibilities under the Marine Protection, Research, and Sanctuaries Act of 1972.

All of the activities affected by these laws have the potential to adversely affect living marine resources and their habitat. NMFS, EPA, FWS, and state fish and wildlife agencies have authority to review these activities, assess the impact of the activities on resources within their jurisdiction, and comment on and make recommendations to ameliorate those impacts to regulatory agencies. Review and comment authority is provided by the Fish and Wildlife Coordination Act of 1934 (as amended 1958) and the National Environmental Policy Act of 1969. Consultative authority extends to all projects which modify waters of the U.S. and require federal permits or licenses, or that are implemented with federal funds.

Other legislation under which NMFS provides comments relative to potential impacts on living marine resources, their associated habitats, and the fisheries they support include, but are not limited to, the Coastal Zone Management Act of 1972; the Marine Protection, Research and Sanctuaries Act of 1972; and the Endangered Species Act of 1973 (Section 7 consultation). A more detailed discussion of the pertinent legislation affecting the protection, conservation, enhancement, and management of living marine resources and habitat can be found in the NMFS Habitat Conservation Policy (*FR 48(228):53142-53148*).

In addition, NMFS and the other federal resource agencies are involved in other programs with the States (e.g., NMFS Saltonstall-Kennedy and Wallop-Breaux programs) that provide grants to conserve fish habitats and improve fisheries management.

**b. Council policy.** Recognizing that all species are dependent on the quantity and quality of their essential habitats, it is the policy of the New England Fishery Management Council to:

Conserve, restore and enhance habitats upon which commercial and recreational marine fisheries depend, to increase their extent and to improve their productive capacity for the benefit of present and future generations. (For purposes of this policy, habitat is defined to include all those things physical, chemical and biological that are necessary to the productivity of the species being managed.)

This policy shall be supported by four policy objectives which are to:

- (1) Maintain the current quantity and productive capacity of habitats supporting important commercial and recreational fisheries, including their food base. (This

objective will be implemented using a guiding principle of NO NET HABITAT LOSS.)

- (2) Restore and rehabilitate the productive capacity of habitats which have already been degraded.
- (3) Create and develop productive habitats where increased fishery productivity will benefit society.
- (4) Ensure that any fishery management plan which is prepared by the Council with respect to any fishery shall include readily available information regarding the significance of habitat to the fishery and assessment as to the effects which changes to that habitat may have upon the fishery.

The Council shall assume an active role in the protection and enhancement of habitats important to marine and anadromous fish. It shall actively enter federal decision-making processes, to include entering into Memoranda of Understanding with regulatory agencies, where proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council. Participation may be pursued by whatever form appropriate, including but not limited to Memoranda of Understanding.

**c. Habitat information needs.** The Council staff participated in the Northeast Region Fisheries Data Needs Workshop held March 31 - April 1, 1993. Habitat information needs was one of the items discussed in the context of overall data needs. Among the data needs that were identified at this workshop are site-specific information on where and when fishing is taking place, and a reworking of existing databases to make them useable in a geographic information systems, GIS, model. A further point was made at the workshop that "several basic research questions have to be answered on marine habitats." The data monitoring needs are large-scale but only need to be complied over a short time series. The workshop produced a data needs table which included some habitat data needs and which was organized by both collection and application parameters. The workshop also laid out the second phase of the data redesign initiative which will consider appropriate data collection vehicles.

#### **4. Recommendations for Habitat Conservation.**

Under the MFCMA, the Regional Fishery Management Councils have the responsibility not only to prepare fishery management plans, but to address habitat requirements, describe potential threats to habitat and recommend measures to conserve those habitats critical to the survival and continued optimal production of managed species. The National Marine Fisheries Service (NMFS) Habitat Conservation Policy (48 CFR 53142-53147), and specifically Implementation Strategy 3, provides the basis for a partnership between NMFS and the Councils to assess habitat issues.

The Magnuson Act, however, limits the Council's role to commenting on proposals that would affect fishery resources and their habitats. Decisions on such projects rest principally with the Army Corps of Engineers (ACOE) and the Environmental Protection Agency (EPA). Other federal agencies, including the U.S. Fish and Wildlife Service and the U.S. Coast Guard are involved in this process as well. In order for the Council to effectively manage fishery resources, more cooperative relationships should be fostered between managers and other habitat protection agencies.

In addition to habitat protection in the EEZ, protection for coastal habitats also is essential because of its role at some point in the life cycle of all inshore and most offshore species. For example, the condition of offshore resources may be compromised when forage species (which may depend on coastal habitats) are reduced as a consequence of degradation of the inshore environment. Because of the link between habitat quantity and quality and fishery production, the Council is concerned about impaired habitat quality and committed to assuming an active role in habitat protection.

Specifically with respect to American lobster resources, the following recommendations address habitat loss and degradation as mandated under federal law, including the Magnuson Act, Fish and Wildlife Coordination Act, Clean Water Act, Endangered Species Act, Marine Mammal Protection Act, Marine Protection, Research and Sanctuaries Act, Section 10 of the Rivers and Harbors Act, Oil Pollution and Control Act, Comprehensive Environmental Resources Compensation and Liability Act, Coastal Zone Management Act, Federal Power Act and others.

**Habitat Recommendations: (RESERVED)**

**5. Recommendations for Further Research.**

a. The mapping and characterization of lobster habitat types needs to be accomplished throughout U.S. waters. Changes in species composition by area, from a hard bottom complex to a soft bottom complex and prey diversity on each bottom type should be determined. This information is an important precursor to recruitment assessments and to mobile gear impact studies.

b. Mobile gear impact research has been conducted on sand and mud substrates. Valuable data has been collected on its effects on lobster and habitat; however, similar research is sorely lacking on hard bottom habitat.

c. There is a need to resolve the question of stock identification, particularly as related to inshore/offshore components south of Georges Bank. Appropriate genetic studies are highly recommended and a compilation and analysis of existing tagging data should be undertaken prior to any new tagging studies.

d. More precise and accurate estimates of stock sizes and fishing mortality rates may be developed if uncertainties regarding the relative selectivity of of pre-recruit and fully-recruited lobsters to bottom trawl survey gear are resolved. Appropriate field studies of lobster availability and research vessel gear selectivity are considered a priority.

e. Field studies are urgently needed to evaluate differences in fishing power and lobster selection characteristics between NMFS and state research vessel bottom trawls to allow integration of historic state and federal trawl survey databases and to optimize future cooperative survey work. Proper integration of all existing databases will allow preparation of much more rigorous stock assessments.

f. A scientifically rigorous study of V-notching practices in the Gulf of Maine fishery is needed to reduce uncertainty in estimation of biological reference points.

## **IX. ENVIRONMENTAL CONSEQUENCES**

### **A. BIOLOGICAL IMPACTS**

#### **1. Introduction.**

Under the "no action" alternative, the aggregate  $\frac{1}{16}$  inch increase in the minimum size limit in Federal waters would be expected to result, over time, in a slight increase in the spawning stock size, but that increase would not be sufficient to eliminate the overfished condition of the resource, even with no further increases in the fishing mortality rate. It is also expected that this alternative would result in a small increase in yield per recruit. Both effects would be minimal since only about 29 percent of total landings are from Federal waters. It is very unlikely that the states would institute complementary increases in the minimum size for territorial waters, although other measures addressing fishing effort might be considered.

The preferred alternative will reduce fishing mortality and eliminate overfishing in Federal waters over the planning horizon. Considering only that portion of the resource resident in Federal waters, the preferred alternative should result in significant increases in the spawning stock size and in yield per recruit. But the major portion of the resource is found in state waters. As the framework process becomes effective and regional measures to reduce fishing effort are adopted it is possible that, over the short term, effort may be shifted from Federal to state waters. However, by virtue of the fact that Amendment #5 has taken a regional approach with industry choosing the specific measures to be adopted, the likelihood is maximized that states might adopt complementary measures in adjacent territorial waters, thus benefiting the resource as a whole.

#### **2. Quantitative Impact Assessment. (RESERVED)**

### **B. ECONOMIC IMPACTS**

#### **1. "No Action" Alternative.**

If no action is taken at this time the minimum size in Federal, but not State, waters will increase in two  $\frac{1}{32}$  inch increments to  $3\frac{5}{16}$  inches as mandated by Amendment #2.

The economic impacts of this change would arise from five principal effects upon the market:

(1) The larger average size and smaller number of lobsters supplied to the market would cause a realignment of prices and gross revenues to the industry. A 1992 study for the NEFMC (Richardson, 1992 pp. 86-90) estimates the impacts of the two previous  $\frac{1}{32}$  inch

gauge increases (which applied to both Federal and State waters) to be negligible (i.e., one to two percent which is well within the expected range of error of the available data). The smaller supply, price and revenue effects that would be expected to arise from a change in the minimum size applying only to Federal waters, consequently, would also be expected to be negligible.

(2) The increasing difference between Canadian and U.S. minimum sizes would have the effect of removing about 8-10% of potential Canadian supplies from the U.S. market. In this case the effect of a change in the Federal minimum size would be comparable to that experienced with the first two gauge increases because a change in the Federal minimum size would apply to all Canadian imports. The applicable U.S. law is the so-called Mitchell bill which prohibits the import of live lobster at a size below that established in the Federal fishing zone. The overall supply, price and revenue effects, implicit in the Richardson estimates mentioned above, would also be expected to be minimal.

(3) The Mitchell bill also prohibits interstate trade in live lobster below the minimum size in Federal waters. For each of the producing states this would mean anywhere from 8-12% of total landings would need to be reserved for domestic (i.e., within the state) consumption. If enforced, this provision of the Mitchell bill would cause relatively strong downward pressures on the price of small (under the Federal minimum size) lobsters landed from state waters. This would be the case especially in Maine where 10-15% of all lobsters landed are within this size class, where a considerable part of exvessel demand is for pound-stock lobsters destined for out-of-state markets, and where in-state consumption is low relative to the volume of landings.

(4) The withdrawal of Canadian supplies of small lobsters (2 above) and state supplies of small lobsters from the overall market would be expected to reduce the ability of the market to match supplies to demand, especially at certain times of the year. This could lead to more volatile prices and a lowered reliability of supply. Both these impacts have complicated, but generally negative, effects on the market that affect client (wholesale distributors, restaurants, etc.) preferences and hence demand and ultimately prices. It is not possible to estimate these impacts given available data.

(5) Finally, differences in the Canadian and U.S. minimum sizes would be expected to change the relative competitive position of Canadian and U.S. exporters to Europe and Asia. Because size preferences in overseas markets are variable depending on local tastes (Japan and northern Europe appear to prefer small lobsters and other markets large) and because the timing of local demand is also variable by season (leading to differential abilities of the U.S. and Canadian industries to meet those demands), the net effect of gauge differences is not readily apparent and, given the lack of appropriate data, not subject to estimation. One response of the market to the last gauge increase was the movement of the operations of some U.S. exporters to the Canadian Maritimes. This response to the gauge differences allows the U.S. dealer access to all Canadian and all U.S. lobsters and improves his

competitive position in the export market. Unfortunately, this response also tends to export economic activity to Canada.

## **2. Preferred Alternative.**

This section summarizes the major economic impacts of the preferred alternative. It does not include an evaluation of minor impacts such as increased paperwork required under the mandatory reporting system. Because this amendment essentially provides framework procedures for implementing a stock rebuilding program in the future, it includes only a few measures that have major impacts at present. The three measures that will have immediate impacts in terms of restricting the landing of lobsters are the moratorium, restrictions on the catch of lobsters by recreational fishermen and the first-year restrictions on the landing of lobster using gear other than lobster traps.

**a. Moratorium.** The major impact of the moratorium will be on any fishing operations that currently depend on lobster landings for a part of their income but which will not be able to continue to land lobsters from the EEZ. The moratorium will prevent the issuance of new permits for additional lobster fishing operations in the EEZ. Additionally, it may prohibit the landing of lobsters by an unknown number of fishermen who currently land lobsters but who did not have a federal or federally endorsed lobster permit before the March 1991 control date. Unfortunately, it is difficult to evaluate the impacts of the moratorium because of differences among state and federal permit systems and because the permit data is not very well organized and cross-referenced.

The NMFS estimates that between the control date and the present time 1,544 new permits were issued (Table IX.B.2.). Except for new permits issued for vessels that would qualify under the moratorium but were transferred or replaced, the remainder of these vessels permits were issued would not qualify under the moratorium rules. There is no information, however, about how many of the new permits represent vessel transfers or replacements, or about how much lobster is landed by these new permit holders or the extent to which the new permit holders depend on their catch of lobsters for income. To obtain a federal permit, applicants for any other federal fishing permit in the northeast must check a box on an application form at no additional cost. Consequently many applicants can obtain a permit whether or not they expect to catch any lobsters. Additionally, the adoption of the lobster control date by the New England Council might have increased the incentive for applicants to obtain a permit with the belief that the permits would increase in value if they were somehow eventually grandfathered-in under a limited entry program.

Table IX.B.1. Number of Commercial Lobster Permits - 1993

Source		Number of State Permits (Resident)	Number of Federal or Federally Endorsed Permits
Maine		6,200 <sup>1</sup>	2,260
New Hampshire		859	66
Massachusetts	Coastal	1,624	869
	Offshore	711	711
Rhode Island	Lobster only	182	0
	Multipurpose	718	0
Connecticut		449	90
New York		1,207	334
New Jersey		65	0
NMFS		0	4,084
TOTALS		11,302	14,568

Notes:

<sup>1</sup> Estimated, based on 1992 data. Some federal permit holders also have federally endorsed state permits.

The largest category of new permits is for the lobster trap fishery. An unknown number of these reportedly have been issued to lobstermen who already have federally endorsed state permits but who mistakenly believed that they might not qualify under a moratorium in the EEZ if they didn't also have a federal permit. Alternatively the increase in the number of permit applications may have been from, 1) lobstermen who fish in state waters but want to preserve their option of eventually being able to fish in the EEZ, 2) lobstermen who currently fish in federal waters but who do not have a federal or federally endorsed permit, or 3) lobstermen who have actually extended their operations from state waters into the EEZ. Impacts of the moratorium would be more significant on these last two categories of permit holders because it would curtail existing rather than potential fishing activities. Other data, however, suggest that the increase in the number of permits may have resulted from more permit applicants rather than an increase in the level of activity in the EEZ lobster trap fishery.

Table IX.B.2. Number of Federal Lobster Permits Issued Since the March 25, 1991 Control Date.

Type of Gear	Number of Permits
Lobster traps	1,025
Bottom trawls	55
Gillnets, entanglement nets	21
Commercial hook gear	7
Rod and reel	28
Diving gear	309
Dredge vessels	10
Other or unknown gear	89
<b>TOTAL</b>	<b>1,544</b>

Except in Maine, state lobster permit data do not indicate that there has been a large increase in the number of lobstermen fishing in the EEZ (who would be displaced by the proposed moratorium). In New Hampshire, Massachusetts, and Connecticut the number of federally endorsed state permits decreased from 1,814 in 1990 to 1,736 in 1993. In Maine the number of federally endorsed state permits increased from 1,782 in 1991 (1990 data was not available) to 2,260 in 1993, but other data such as the total number of state permits and the number of traps and landings show no corresponding expansion in lobster fishing activities. Although permit data is not available for 1990 and 1993, the total number of state permits decreased from 6,940 in 1991 to 6,162 in 1992. And while there is inadequate information about changes in the number of traps fished since the control date, particularly in the EEZ, the pattern of lobster landings in Maine has mirrored those in New Hampshire and Massachusetts. In all three states, landings increased in 1991 but then declined in 1992 compared to 1990 levels. In other words, because there was no increase in Maine landings for these years compared to the landings patterns of other nearby states, there does not seem to be a substantial increase in lobster fishing in the Gulf of Maine EEZ that corresponds to the increase in the number of federally endorsed permits in Maine and which would be adversely impacted by the moratorium.

**Table IX.B.3. Change in the Number of Federal and Federally Endorsed Lobster Permits Since the Control Date**

Source		Number Before the Control Date	Number of Permits in 1993
Maine		1,782 <sup>1</sup>	2,260
New Hampshire		63	66
Massachusetts	Coastal	926	869
	Offshore	731	711
Rhode Island		0	0
Connecticut		94	90
New York		NA	334
New Jersey		0	0
NMFS		3,415 <sup>2</sup>	4,084 <sup>2</sup>

Notes:

<sup>1</sup> Data are from 1991 because similar data from 1990 were not available.

<sup>2</sup> Some federal permit holders also have federally endorsed state permits.

NA Not available.

Table IX.B.2. indicates that 1,025 new federal permits have been issued to lobster trap vessels since the control date. But it is unlikely that this represents a real increase in the numbers of trap fishermen. New lobster fishermen typically begin in state waters unless they have a lot of experience in the offshore fishery and have accumulated enough capital to finance offshore operations. As mentioned earlier the total number of state lobster permits has not increased by a similar amount. While there has probably been an expansion into federal waters as increased competition in inshore areas has caused some lobstermen to move into federal waters, most of the increase in the number of federal permits since the control date probably represents an increase in applications by fishermen who either already have federal endorsements or who fish primarily in state waters. Unfortunately, current fisheries data is not adequate to document this conclusion.

Because of the absence of programs for the federal endorsement of state permits in Rhode Island and New Jersey, it is not possible to determine specifically if there has been an increase in the number of lobstermen or lobster traps in the EEZ by fishermen already licensed by these states. In New Jersey, however, the number of state permits for the territorial sea trap fishery decreased from 70 in 1991 to 65 in 1993. In New York, permits may be federally endorsed, but data from before the control date is not available.

The potential impact of the moratorium on vessels fishing with gear other than lobster traps may be put into perspective by referring to Table IX.B.2. Some of the new permit

holders who fish with gear other than lobster traps are already subject to state restrictions. Those from Maine are prohibited from landing any lobsters in Maine ports and those from Massachusetts are restricted to landing no more than 100 pounds in Massachusetts ports. According to this information (Table IX.B.2.), 55 bottom trawl vessels, 21 fixed net and 10 dredges will not be able to land any lobsters that they would otherwise. The dredge vessels would not be as severely affected as the trawl vessels because dredges have historically caught less lobsters (see discussion of restrictions on vessels in permit category A). Although lobsters can be caught with hook and line gear, hook and line fishermen probably do not catch enough lobsters to be adversely affected to any significant degree.

**b. Restrictions on Recreational Fishermen.** Divers and rod and reel fishermen who are recreational fishermen should not be affected by the moratorium because they would be able to keep up to six lobsters per person aboard the vessel. Although there is no data on landings by recreational divers, they have commented at public hearings that they will occasionally catch more than six lobsters. This limit, however, corresponds to the recreational catch limit in New York and the Council believed that it would not be restrictive for the vast majority of recreational outings on which lobsters are caught. While there are commercial lobster divers in New England, particularly off of Provincetown, these operations reportedly take place entirely in state waters.

**c. Restrictions on Vessels in Permit Categories A and B.** Two restrictions might have an impact on lobster landings by vessels that qualify under the moratorium. (1) The proposed action would restrict lobster landings to 100 lobsters for category A vessels (vessels fishing with gear other than lobster traps and which qualify under the moratorium but which cannot document landings of at least 300 pounds of lobsters on at least one trip prior to the control date. (2) The proposed action includes a target quota that might restrict the lobster landings to 100 lobsters per trip by category B vessels (vessels fishing with gear other than lobster traps and which qualify under the moratorium and which can document landings of at least 300 pounds of lobsters on at least one trip prior to the control date). The Council adopted these measures to prevent large transfers of fishing effort from scallop and groundfish fishing to lobster fishing. The Council did not intend for these measures to change historical (prior to the control date) fishing patterns.

For the purpose of this analysis, 100 lobsters are assumed to weigh about 125 pounds. The actual weight of 100 lobster may be slightly less in heavily exploited inshore areas and substantially more in lightly exploited offshore areas. Figure IX.B.1. shows the cumulative distribution of lobster landings by otter trawl vessels. For example, in both the Gulf of Maine and Southern Cape Cod to Long Island Sound areas about 80-85% of otter trawl trips landing lobsters, landed 125 pounds or less. In the Georges Bank and Offshore area, some 75% of the sampled trips had lobster landings at or below this level. In other words, most trips and presumably, most vessels would not be substantially restricted by the 100 lobster limit.

Category A limits could also apply to vessels other than otter trawlers, such as scallop

dredges and gillnets. Again, the 100 lobster limit would not force these vessels to discard lobsters that were caught solely as a bycatch rather than as a targeted species. For example, on 9 of the 12 scallop dredge trips included in the NMFS 1992 weigh-out data on which lobsters were landed, less than 125 pounds of lobsters were landed. The high landings on the 3 other trips indicated that lobster were being targeted and that those vessels would probably fall into category B if they landed similar trips before the moratorium.

To address the needs of the non-lobster-trap vessels that historically have depended on lobsters for a substantial share of their income, the Council created permit category B. This category will be comprised of vessels which can document landings of more than 300 pounds on at least one trip prior to the control date. The proposed action intends to limit the catch of lobsters in the non-trap fishery to no more than 4.5 million pounds (based on 8 percent of 1992 lobster landings of 25,328 metric tons -- 56 million pounds). To accomplish this, it would not limit lobster landings by the non-trap vessels unless lobster landings for all vessels using gear other than lobster pots reaches 3.35 million pounds during the first year after implementation. In other words, unless there are large shifts in fishing effort into the lobster fishery, this provision will not be implemented. According to NMFS commercial fisheries weigh-out data (Table IX.B.4. and Figure IX.B.2) about 2.5% of total lobster landings or an annual average of 1.2 million pounds (562 metric tons) were landed by otter trawls with an additional 190,000 pounds by other gear during the most recent five-year period (1988 - 1992) for which there is data.

From comments at the public hearings, the Council has determined that the NMFS weigh-out database probably underestimates the actual landings by gear other than lobster pots. The true catch level by this gear sector may not be currently estimable. If there is a large shift in fishing effort into the lobster fishery, then a cap would be needed to keep lobster fishing mortality from substantially increasing, particularly in the overfished Southern Cape Cod-Long Island Sound and Gulf of Maine resource areas.

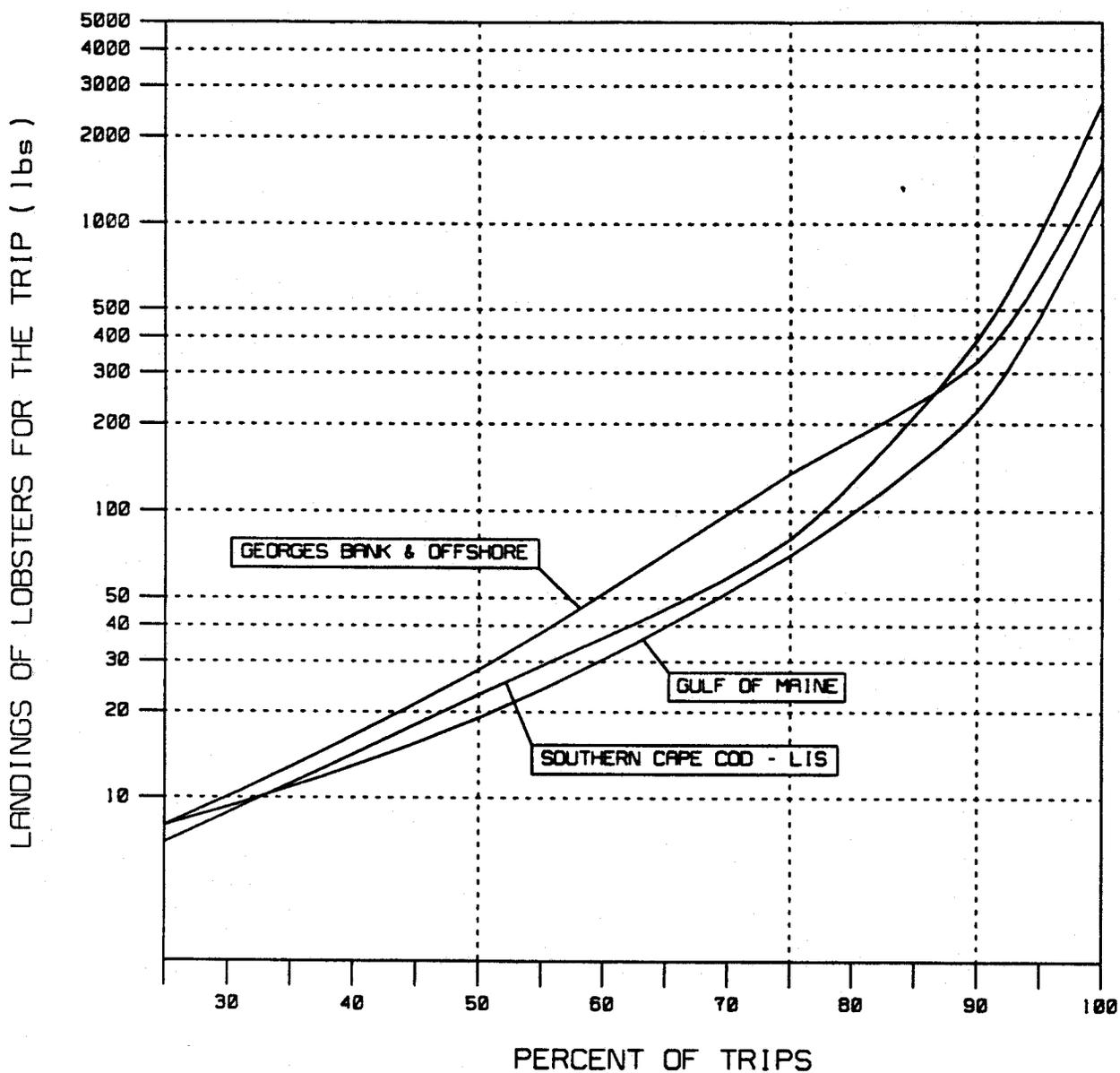


Figure IX.B.1. Cumulative distribution of trip catches of lobster by otter trawl vessels determined from sea-sampling data for the period 1989-1992, for the three assessment areas, all shown on a logarithmic scale for clarity. The figure shows, for example, that 90 percent of the trips that were sampled landed 400 pounds or less of lobster.

Table IX.B.4. Lobster landings (metric tons) by gear type, 1964-1992, from the NMFS weighout database.

Year	Offshore Pots	Inshore Pots	Other Pots	Trawls	Other Gear	Total	Percent Trawl Gear
1964	0	12,163	14	1,727	10	13,914	12.4
1965	0	11,191	29	2,481	18	13,719	18.1
1966	0	11,566	49	1,776	10	13,401	13.3
1967	0	10,023	46	2,046	14	12,129	16.9
1968	0	12,210	45	2,476	25	14,756	16.8
1969	0	12,215	4	3,074	20	15,313	20.1
1970	0	12,251	23	3,196	19	15,489	20.6
1971	1,317	11,453	19	2,477	14	15,280	16.2
1972	2,889	10,623	6	1,092	16	14,626	7.5
1973	1,945	10,518	5	671	11	13,150	5.1
1974	1,743	10,253	5	954	8	12,963	7.4
1975	1,935	10,962	3	782	19	13,701	5.7
1976	2,044	11,621	3	598	14	14,280	4.2
1977	2,008	11,882	4	504	14	14,412	3.5
1978	2,199	12,937	4	483	8	15,631	3.1
1979	1,946	14,535	4	413	14	16,912	2.4
1980	1,657	14,818	2	392	12	16,881	2.3
1981	1,401	15,848	2	327	173	17,751	1.8
1982	2,808	16,449	3	269	14	19,543	1.4
1983	2,442	17,519	2	360	6	20,329	1.8
1984	3,556	16,588	10	504	11	20,669	2.4
1985	2,789	17,449	10	386	682	21,316	1.8
1986	2,532	17,139	10	476	625	20,782	2.3
1987	3,165	17,050	11	512	87	20,825	2.5
1988	2,310	18,938	11	618	358	22,235	2.8
1989	2,604	20,571	8	565	28	23,776	2.4
1990	3,939	22,927	11	691	14	27,582	2.5
1991	5,730	22,617	16	706	19	29,088	2.4
1992	3,284	21,785	15	231	13	25,328	0.9
<b>Weighted Average 1964-1992</b>							<b>6.41%</b>

# LOBSTER LANDINGS BY GEAR TYPE

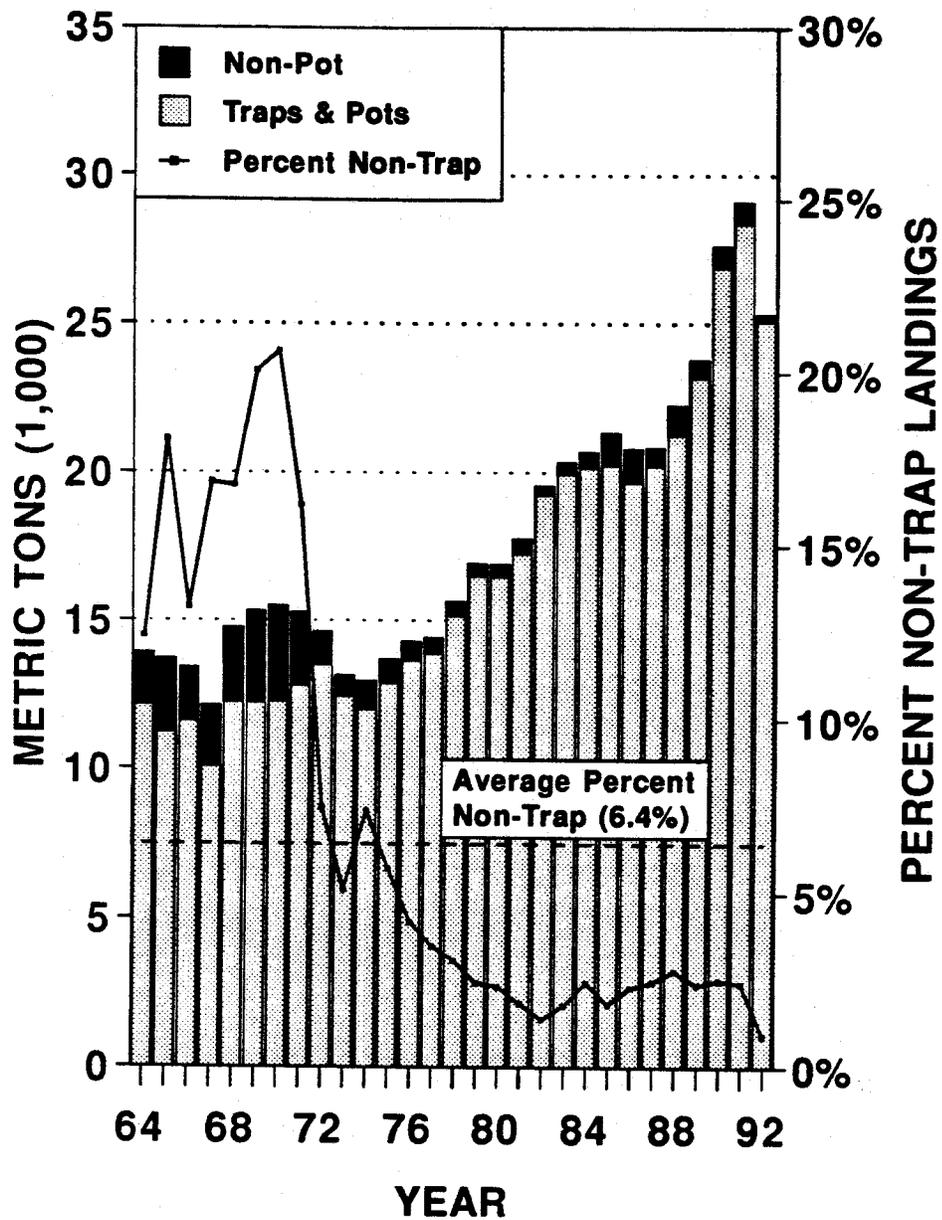


Figure IX.B.2. Lobster landings by gear type over the period, 1964-1992, from the NMFS weighout database.

## C. SOCIAL IMPACTS OF PROPOSED ACTION

### 1. Introduction to the Social Impacts Assessment.

The purpose of the social impact analysis is to provide the public and managers with systematic information concerning the relative social benefits and costs of proposed alternatives relative to taking no action. While the economic analysis, contained in Appendix IV, describes projected impacts of the action on resource supply and demand, prices, individual and fleet revenues, and employment, this social impact assessment describes the changes that might occur in the social relationships between persons and/or groups, within the communities, and within broader regional social systems resulting from the proposed action relative to taking no action.

NMFS has issued guidelines on how this assessment should be conducted (Operational Guidelines, 1992). Four variables are identified as being essential to such an analysis: demographic characteristics, fishery related services and employment factors, the costs (services) and benefits (tax revenues) to local jurisdictions, and the non-economic social and cultural aspects. The first three variables are discussed in other sections of this document (except that local tax information was not presented). This section examines, to the extent that the data permits, the impacts on lifestyles, family and community relationships.

The lack of consistent, long-term, systematic data collection, particularly on the small-scale fleet, severely hampers the assessment of the potential impacts of Amendment #5. Mid-range and small vessels, especially those that fish days and are opportunistic (switching gear and species as the season, availability, and inclination dictate), are particularly under-represented in the collection of statistics on catch and earnings. Sociological and cultural data is even more broadly uncollected than fishery statistics.

For the purposes of establishing a baseline, and for projecting the impacts in this section, the primary data source is interviews with fishermen and others familiar with the industry. Consequently, the analysis focuses largely on fishermen's perceptions of the management process and its ability to successfully manage the resource. The fishermen's perspective is an important consideration in management, due in part to the voluntary compliance that is needed for the management program to be successful.

This lack of systematic data was pointed out by Peterson and Smith in their report, *Small-Scale Commercial Fishing in Southern New England* (Woods Hole Oceanographic Institution Technical Report, August 1981), but little has been done in the last ten years to remedy this situation. Interviews for this assessment have included some of the under-60-foot vessels that fish days, but should not be construed as truly representative of the group. Information on the impacts on the large vessels is also biased, emphasizing the views of owner-operators and fishing organizations' representatives.

Many fishermen disagree with the catch and economic projections included in this document, and they genuinely fear that the proposed measures threaten the financial survival of today's fishermen. At least two possible conclusions are evident about the social impacts of the proposed action: first, the social and economic changes resulting from the effort reduction program will be substantial; and, second, because the effort reduction program would substantially change the way the fishery is managed, the program will probably redistribute benefits among vessels of different sizes, from different ports and which catch a different mix of species. The extent of this redistribution, and in what directions, cannot be determined and is the subject of considerable debate.

The socio-cultural impacts of Amendment #5 will not be uniform across the region, across vessel sizes or even across gear types. Nor will the impacts be the same for each community, each generation of fishermen, each ethnic group, and each organization. It is partly this certainty (that the impacts will vary) that creates anxiety among all who are involved in the fishing industry. Anxiety about the likely impacts dominates the conversation and thoughts of fishermen as the Council struggles to cut back fishing effort among the disparate elements of the industry.

## **2. Impacts on Individuals, Families, and Communities.**

The effectiveness of any management system depends not only on whether or not the regulations are based on accurate information and proper scientific analysis, but on whether or not the industry complies with the regulations. In fisheries management, compliance with regulations relies to some extent on voluntary compliance because of the difficulty of enforcing regulations at sea.

Decisions about compliance, however, are also affected by a perception of what the impacts of that compliance will be on an individual's ability to make a living or survive financially. The uncertainty about what the impacts will be at an individual level, both in the short term and the long term, causes many fishermen to be extremely negative about the impacts of the proposed fisheries management measures.

The bioeconomic analysis of the proposed measures predicts a gradual recuperation of lobster stocks and an initial dip and gradual recuperation in revenues and profits in comparison to taking no action. Long-term bioeconomic benefits (ten years and beyond) of the proposed action exceed the impacts of the no-action alternative.

If effort is cut by 20 percent in the Gulf of Maine and 50 percent in inshore southern New England, the models predict that stocks would rebound and landings and catch rates would increase. For a variety of reasons, including scientists' earlier mistakes in predicting some stock sizes (e.g., herring), and past experience with regulatory change (e.g., groundfish quotas in the 1970's), many fishermen do not believe that these new regulations will have the positive benefits predicted. Many fishermen simply do not believe that prices will increase

sufficiently to counteract the losses in landings, citing both the effect of imports on prices and the consumers' willingness to pay a higher price. Fishermen's fears about the impact of the proposed measures could lead to a greater degree of non-compliance with regulations and/or technological innovations which, in turn, could compromise the plan's effectiveness, slowing stock recovery.

Other fishermen believe that, while the effects of the plan may be beneficial in the long run, in the short term their own financial stability is generally viewed as precarious and likely to fail. To the extent that success of a management program is affected by fishermen's perceptions of what the effect of the proposed regulations will be on their lives and businesses, this section, assessing the socio-cultural impacts, includes discussion of the fishermen's points of view.

"We will be in the hole, out of business, ruined," fishermen say. Indeed, it is inevitable that some fishermen will be bankrupted by the efforts being made to control fishing for the long-term health of the industry. Bankruptcy *per se*, however, is not unknown in the industry. Business failures are common at every step from the vessel to the retail market. The nature of the business: cyclical supplies, perishable product, multitudes of independent entrepreneurs exploiting their own niche, consumers' fancy, even the vagaries of weather affect the success of the various businesses.

Fishermen can face the constraints and hardships imposed by the nature of their business with equanimity as long as they feel free to work hard to overcome the challenges. "Independence" and "freedom" are two of the most frequently mentioned attributes of fishing that make it a satisfying occupation even though fishing is a highly regulated industry influenced by a number of external factors outside of fishermen's control. Financial rewards are also frequently cited by fishermen explaining what initially attracted them, but it is the "way of life" that seems to keep men fishing despite long hours of hard, sometimes dangerous, physical labor and today's uncertain financial reward. Fishing is also one of only a few employment alternatives available in some communities.<sup>1</sup>

The "way of life" is what many fear is threatened by management under Amendment 5. Just how to characterize what constitutes the beloved "way of life", and how it is threatened is not easy. The desire to preserve a way of life does not necessarily mean that fishermen are wedded to the technology or fishing style of a single point in time, despite a "conservative" reputation, since fishermen as a group are remarkably adaptable. The old dory fishermen handling hooks on a line off wooden sailing vessels have given way to fishermen towing or hauling nets of synthetic fibers with hydraulics and high-tech electronics

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<sup>1</sup> Lack of formal education and limited experience in other occupations as factors preventing employment in alternative occupations were noted by Peterson and Pollnac in the chapter in Doeringer, et. al. 1986.

on diesel-powered, steel-hulled vessels. Changes in equipment, in target species, in markets, and in costs have all been faced by individual fishermen with varying degrees of success. Nevertheless, some aspects of fishermen's lives and jobs have not changed a great deal over time.

The independence and freedom fishermen speak of is both physical and abstract. Anyone who has stood on a deck of a boat, dwarfed by the enormity of the surrounding waters and sky, blown by the unseen wind, can (on a good day) with the barest glimmer of imagination sense the promise of freedom offered by working at sea. The independence and freedom of an owner-captain to decide when, where, how and for what to fish is replicated by the freedom of crew to choose to go out or not on a given trip and/or to seek a different site, perhaps one higher in the hierarchy (e.g., "per man") or one on a highliner vessel. Captains and crew talk about the "mystique", "magic" and "joy" of fishing.

Fishing can be characterized as the epitome of the American Dream. Immigrants, youth with drive and ambition but lacking in academic skills, and other individuals unable to conform to land-based jobs have sought opportunities at sea, and many have had great success. Others, if not high-achievers, have nevertheless been able to provide for themselves and their families with pride. Not everyone achieves the status of captain-owner, but many relish the potential. Furthermore, all have retained the freedom to experiment with different types of fishing, including different gear, different species, different locations, different trip lengths and different degrees of devotion to fishing.

Despite the hierarchical patterns inherent in the fishing community, notable, for example, in the competition to become high-liners and in the organization of crews (captain, "per men", deckhands), there is a strong egalitarian ethic that everyone should have an equal opportunity to catch fish. In fact, this egalitarian ethic promotes a general sense that the range of landings and/or income should be relatively stable among vessels of the same class. The value placed on equity could explain why there are often demands by some fishermen for restrictions on innovative gear such as pair trawling or "rock-hoppers" that results in major imbalances among vessels' landings. This position, however, stands in pronounced contrast to the value placed on individual opportunity, and the freedom to choose where and when to fish and how much to catch with whatever technology is available.

Besides freedom, independence, equal opportunity and the potential to rise in status and position through one's own efforts, another component of fishing as "a way of life" is a sense of community, connecting all fishermen and their families to others in the industry. Although fishermen are in competition with each other and despite serious gear conflicts, fishermen have much in common. In discussions over coffee before heading out, socializing at family or town celebrations, fishermen generally find common ground with each other. Furthermore, a common danger unites everyone, and even the fiercest competitors will help tow disabled vessels or loan a pump or otherwise aid a fellow fisherman.

Despite many changes in the industry over the years, sons (and occasionally daughters) often follow their fathers' lead, continuing a family tradition of fishing. Families of fishermen, particularly in the Italian and Portuguese communities, frequently rely on each other for help or moral support when their relatives are at sea. The family fishing business, characteristic of many rural or ethnic communities, provides employment, income and security for a network of individuals extending well beyond the immediate family of the owner.

Until now, the lobster plan's regulations have not encroached on a captain's freedom to choose. The concept of optimum yield which is the foundation of domestic fisheries management requires the consideration of social values, even to the extent that they may modify some optimal biological harvest level. The current management strategy, using a minimum size, protection of berried females and v-notch lobsters, restrictions on parts and meat, and requirements on trap construction, has generally not affected decisions about where to go or how to fish, and has not been generally perceived as threatening basic social or cultural values. Though fishermen have initially voiced complaints about some regulations (notably the requirements for escape vents and escape panels in lobster pots, and protection for v-notch lobsters outside of Maine waters), for the most part the current regulations reflect long-standing convictions about how the fishery ought to be managed. The regulations have allowed diversity in the fishery to continue.

Adjustment to the new package of regulations is likely to be more difficult primarily because of serious financial fears and uncertainties associated with the plan, but also because of the limits on "wiggle room." The restrictions are perceived as more "cut and dried" than in the past, with less potential for bending or circumventing the regulations.

Many fishermen view the changes coming out of Amendment #5 as not so gradual as, and more fundamental than is being presented. The package as a whole is what frightens some fishermen. Beyond the question of economic survival is a very fundamental fear that fishing will be ruined by the confusion engendered by the complexity and proliferation of the multiple regulations. A number of men proclaimed that they chose fishing in part because they wanted to "get away from it all." "It" being the complexity of life ashore.

Some of the regulations contained in Amendment 5, such as the moratorium, are perceived as limiting the opportunities for the next generation to enter the fishery or to achieve a higher position in the hierarchy, a perception that may not be borne out in reality. Other regulations, such as the effort reduction program, are perceived as having serious economic consequences in the short term. Managers point out that if the regulations succeed, however, the economic consequences may not be severe in the short run and in the long run, will improve revenues while preserving the fishery for future generations as well.

While gradual implementation of effort reductions (5 percent per year) will more likely postpone the most severe economic consequences (e.g. bankruptcy) than larger initial

reductions, they will also delay the accumulation of benefits (i.e. stock rebuilding and improved catch rates). The Council adopted the proposed effort reduction schedule as striking the most optimal balance between the need to rebuild the stocks and the industry's ability to survive effort reductions.

A vessel owner's ability to survive economically depends on the individual vessel's economic performance, its ability to adapt to changing circumstances, and the owner's financial position. For example, vessels that have experienced mechanical problems, straining the financial resources of their owners, may be in a more vulnerable position. Those who are already marginally successful are more likely to fail once cuts are implemented than those whose financial position will enable them to absorb the reductions in revenues or to balance those reductions with reductions in costs.

Many fishermen say that they would certainly accept and abide by the regulations if they did not have to worry about their vessel mortgages, especially since homes are often used as collateral. Many argue that the government should pick up their mortgage payments, pointing to Canadian welfare payments during the two-year moratorium on cod fishing as an example of a government valuing their fishery enough to try to rebuild stocks, while protecting fishermen. Other precedents cited include compensation paid to coal miners when the Clean Air Act was implemented. The Council cannot legislate such compensation, although some forms of assistance have been considered for the groundfish and sea scallop fleet.

If operator ownership becomes lost to corporate or bank ownership, a large measure of freedom and independence will have been lost. Judging from consequences of such ownership in other fisheries (e.g., surf clams-see Hall-Arber, 1992), crew members will also feel the impacts, in some cases losing their jobs, in others being paid a wage lower than their current (average) share or a lower proportion of the proceeds (share) than they currently receive.

In New England, neither banks nor large corporations appear eager to jump into ownership of fishing vessels; although, some banks are recently investigating ways to secure rights to permits of foreclosed vessels. Changes in tax laws have reduced the incentive for non-participants to invest in fishing vessels. Additionally, the economic failure of one fishing operation represents the opportunity for another fisherman to access the fishery by purchasing the permitted boat.

When effort is cut, there may be a surplus of labor. Geography plays an important role in determining the extent to which a community has alternative employment opportunities for their fishermen. The physical characteristics of a region, its population distribution and transportation networks, and other geographical factors which were instrumental in the evolution of a community's character will also determine the impacts of the changes resulting from Amendment #5.

The convolutions of Maine's coastline make industries dependent on road accessibility impractical. Many of the local economies have relied on renewable resources, fish or trees, to generate economic activity. Tourism, a seasonal industry that draws people because of the marine character and remoteness of the coastal communities, is in many parts of coastal Maine the only major employer outside the fishing industry. Jobs in tourism, a very social industry, are often not viable alternatives for most fishermen, since fishing is a solitary occupation.

Geography also affects Gloucester's options. Accessible only from the south, built on granite, reliant on surface water and with sewage capacity problems, the diversity of Gloucester's industrial base has been limited. The geography of Cape Ann, where Gloucester is located, can be inferred from the region's economic history which has been based primarily on rock quarries (now closed), fishing, and tourism.

Only New Bedford is relatively unconstrained by geography. The city is located along one of the major transportation corridors in the Boston-Washington network. New Bedford's harbor has endowed the city with a long tradition in maritime industries including fishing, whaling, and commerce. New Bedford also benefitted from the growth of manufacturing during the industrial revolution which brought wealth to the city and many surrounding communities. In addition to having a strong yankee tradition, the city's link to the sea, combined with its industrial base has enabled New Bedford to be the home for many immigrants and first generation citizens. Other factors, however, such as a poor and less-educated population, a now-polluted harbor, rising debt burden and a manufacturing sector hard hit by recession, may limit New Bedford's future ability to readily absorb further economic dislocation in the fishing industry.

The socio-cultural impacts of the proposed action on the communities is closely linked with the bioeconomic impacts at the individual vessel level and fleetwide. Individuals and their communities will respond to the proposed management action in proportion to the economic impacts that result. In turn, how the economic impacts are manifested will be partly a reflection of the individual or community cultural framework enabling it to adapt to the changes.

The range of alternative employment available to most fishermen is limited by the average fishermen's lack of formal education. This lack of education crosscuts communities, but is even more pronounced in the communities of recent immigrants. The skills that fishermen develop in order to master their trade are not readily adaptable to shoreside occupations. Opportunities in other maritime sectors (coastwise or deep-sea shipping, scientific research and offshore oil development) are extremely limited, especially in New England.

In addition, incomes of fishermen tend to be higher than what they would likely be in equivalent shoreside jobs. This is especially true in New Bedford where unemployment is

high and where per capita income is low (relative to the rest of Massachusetts). Fishermen usually considered themselves in the middle to upper-middle class compared with others in their town. Retraining programs, such as those proposed in recent federal legislation, could alleviate some of the displacement problems that might result from reduced fishing employment opportunities, provided other employment opportunities exist for which displaced fishermen could be trained.

In all of the communities where fishing plays an important role, indirect employment, in addition to direct employment, is threatened by the reductions in effort. Fishing is supported by a whole range of services ranging from providers of fuel, ice, bait, food and equipment, to repair services, lumpers (people who unload boats) and shippers, marketers and processors, insurers and settlement houses. Equipment companies alone provide employment to a whole range of people from high-tech electronics engineers to factory workers constructing lobster traps and ancillary gear. Income multipliers vary considerably among different communities.

Traditionally, the fishing industry has served as a relatively stable sector for many communities experiencing economic difficulties in other sectors. The general economic recession, however, has reduced the industrial base of many communities, further limiting alternative employment. Unless alternative fisheries are developed, effort reductions in the lobster fishery (and the groundfish fishery) will cause labor to exit the fishery at a time when other sectors of the local economies also have a surplus of labor. In the past, fishing has absorbed short-term labor surpluses in many communities.

If some vessel owners fail to make their mortgages and lose their boats, rural communities like Stonington, Maine, whose economic base depends to a great extent on fishing, will have a more difficult adjustment than urban communities with a more diverse industrial base. Fishing-dependent communities, however, will vary in their ability to adapt to the proposed action. Stonington may be more able to survive the short-term reduction in revenues since that community also depends on other fisheries or related industries (aquaculture, urchins, groundfish) than other communities which do not have as wide a range of developed fisheries.

For the many businesses which survive the initial reductions in revenues and benefit from the recovery of the stocks, the long-term benefit would be shared by their communities in proportion to their economic dependence on fishing. Thus, the community of Portland, Maine would probably realize a proportionally greater benefit from the long-term recovery of lobster stocks than, say, New Bedford which fishes on a much wider range of species (scallops, small-mesh species, swordfish, etc.). The degree to which cultural or social change may result from the proposed action is linked to the ability of each community to adapt to the economic changes which will occur when the regulations are imposed.

Fishermen say that they will do whatever they must to keep from failing and losing everything they have worked for. If fishermen must move to different fishing grounds,

change gear, seek different species, they are willing to do so if it appears that by so doing, they can make a living. This flexibility is characteristic of the small boat fleets and has contributed to their survival. The largest vessels have limited options vis a vis gear or species changes because their high fixed costs limit them to catches with high revenue production. In addition, moratoria in other fisheries may constrain switching. To the extent that vessels must leave their base community in search of more profitable fishing areas markets, communities will be disrupted.

Moving home ports might also be difficult, since extended family networks are considered essential to many fishermen's wives. Again, this is particularly true for the Italian and Portuguese wives, but networks of fishing families are important to all. As discussed above, the community connection is also important to the sense of fishing "as a way of life."

Until recently, most fishermen have been reluctant to report violations by others in their community. This is particularly true within the Italian and Portuguese fishing communities where blood ties, religious ties, language and in some cases, the experience of being immigrants, knits together communities otherwise characterized by high levels of competition. In the face of potential economic failure, however, there are indications that more pressure may be brought to bear on the outlaws to conform with regulations and reports of violations may increase. Fishermen's involvement in enforcement could have positive benefits by increasing levels of compliance, but could also produce negative social impacts by dividing communities. Suspicion and dissension could replace trust and unity in the community.

Community cohesiveness is apparently a weaker force than ethnicity. In communities where one ethnic group dominates, there is evidence of a lack of positive interaction among fishermen of different backgrounds. Individuals who do not belong to the dominant group sometimes indicate unfair treatment due to their "outsider" status. The impact of a restrictive management system, or of economic hardship brought about by declining stocks will likely magnify this condition, further polarizing groups within individual communities. The divisiveness could be exacerbated by members of one group only reporting violations by fishermen from ethnic groups other than their own.

### **3. Impacts on the Role of Fishermen's Organizations.**

The organizations may be faced with greater demands for help, for example, fishermen may request their organizations to play a greater role in promotion of seafood to help increase demand (and prices). The organizations may also have to provide more social services for those who have lost sites or vessels.

### **4. Impacts of Specific Measures.**

It is the whole package of regulations that will have major socio-cultural impacts. As

discussed above, the extent of impacts will largely depend on whether or not most of the owner-operators can survive financially to continue the "traditional way of life" and whether they can cope with the host of regulations. Though economists may correctly project a short-term financial burden that will be overcome by long-term financial benefits, the long term socio-cultural recovery and benefits will depend on how drastic the short term impacts are.

The impacts of the broader measures (the moratorium and effort reductions) are assessed here, in the context of the individual values and community dependence on fishing for lobster. There is insufficient data to draw conclusions about the social and cultural impacts of specific measures. Fishermen's perceptions will certainly influence the way the changing management system will impact them, but those perceptions are not necessarily the determinant factor. In many cases the social impact will depend on the bioeconomic impact of a particular measure which is uncertain at this time. Fishermen's views on a particular measure are based on what they perceive the change will do to their income, not that the measure itself holds some socially or culturally undesirable characteristic.

**a. Impacts of the no-action alternative.** Though communities and fishing-related industries are worried about the potential impacts of the new lobster regulations, there is broad recognition that the automatic gauge increases mandated by Amendment #2 would be catastrophic. Moreover, there is widespread fear that the moratoria and effort reduction programs in the groundfish and sea scallop fisheries will lead to massive redirection of effort into the lobster fishery. Most lobster fishermen believe that "something has to be done" to prevent these outcomes.

Some fishermen believe that there are factors other than fishing whose impacts have not been wholly acknowledged, factors such as pollution, acid rain, toxic dumping, habitat degradation and disruption of nursery grounds. Others note that stock abundance is cyclical and that downtrends are not unusual. What strikes some of these men as significantly different is that the changes in gear and electronics allow fishermen to fish in spots that may previously have been "regrouping" areas or safe habitat for lobster. "There are no hiding places anymore," is a common refrain.

**b. Moratorium.** Two distinct opinions exist on the subject of moratoria. One side favors a moratorium since it will, in some ways, protect those fishermen who are being forced to limit their effort from additional effort entering the fishery as the stocks begin to rebound. This view is shared by many fishermen and managers alike.

Another side, however, opposes moratoria for a variety of reasons. Although the proposed regulations only call for a 5-year period for the moratorium, many fishermen distrust the so-called "sunset date", believing that once the moratorium is in place it could be extended indefinitely. Many people in the fishing communities feel strongly that a viable fishery depends on the availability of permits to young fishermen. Without a perceived opportunity for advancement, some fishermen fear that it will be more difficult to hire reliable and skilled

crew. (The perception may be unfounded, however, since individuals are not prevented from entering or leaving the fishery.) This may be a philosophical problem, a reflection of the egalitarian ethic mentioned earlier, rather than an actual one, however, since the displacement of effort resulting from the regulations, will release some experienced crew to the marketplace and make some permitted vessels available for new owners.

In all ports, the moratorium is perceived as limiting opportunity for those who do not already own a vessel. For the recent immigrants in Gloucester and New Bedford, this may be perceived as the loss of a part of the American dream and the fishing "way of life". However, managers argue that in fact, the moratorium is not really a very restrictive measure. Currently, for example, only a fraction of the existing lobster permits are actually used. The cost of buying a permitted vessel would reflect its value, so that while there is a surplus of permitted vessels, the cost of entering the fishery will be relatively low. If the permit becomes intrinsically more valuable due to the moratorium, the economic benefit would accrue to the seller of the permit - namely, the current participant in the fishery who is retiring or leaving the fishery for other reasons. The moratorium as currently proposed is not a permanent limited entry system, although some people have opposed it on the grounds that it is the first step to privatizing a public resource.

The proliferation of moratoria in various fisheries could limit the fishermen's flexibility, a serious economic and psychological impediment to those who traditionally shift gear and species depending on season, weather, market conditions and personal circumstances. Rural communities such as Stonington, Maine, may be hardest hit by the moratoria, since it is the small ports that harbor the majority of the "opportunistic" fishermen. Fishermen might not be willing to sell the permits they are not currently using in order to keep their options open. A shortage of available permitted vessels could then drive the prices up, provided there are stocks to justify paying a higher price for a permit.

**c. Effort Reduction.** The proposed effort reductions (20 percent in the Gulf of Maine, 50 percent in inshore southern New England) frightens most of the affected fishermen because they do not believe that stock rebuilding and or price increases will occur fast enough to allow them to survive economically. Part of the reason for their doubt is that many believe enforcement will not be strict enough to ensure compliance and therefore, recovery. Some fishermen mention other impediments to recovery such as the impacts of pollution, habitat destruction and changes in water temperature. These factors may contribute to the stock conditions, but scientists generally concur that overfishing is the greatest problem.

If stocks rebound very swiftly, the negative socio-cultural impacts will naturally be cushioned. However, the effects of effort reduction in the long- and short-term will be determined largely by economics. If ex-vessel prices go up because of the shortage of product, more vessels may be able to survive. The less economic disruption there is, the less likely there is to be negative social or cultural change. Fishermen fear that imports will fill the market void created by reduced domestic landings in the short term, and the long-term

benefits (economic and social) will be compromised.

Boats with low cash expenses are generally in a better position than vessels with heavy outstanding mortgages. The vessels with skilled crew and up-to-date electronics may have sufficient capability to maximize the return on their effort. Vessel-owners with other sources of capital may also be reasonably secure. Multiple vessel ownership or vertical integration are not common.

Vessels that can cut costs may have a better chance of surviving as well. Individual owners have various options: some, for example, may lay off crew. Where crews are less likely to be reduced because of family connections, such as in Gloucester's Italian fleet and New Bedford's Portuguese fleet, wages or profits may be reduced.

#### **5. Impacts on Native American Fisheries.**

Since there are no known native American lobster fisheries in this region, no direct impacts of this action can be expected. If fishing effort is displaced to those stocks that are the focus of the native American fishing effort, some indirect impact could be expected, but is not predictable or measurable at this time.

#### **6. Impacts on Subsistence Fisheries.**

Since there are no subsistence fisheries in the northeast, there is no need to comment on this issue.

#### **7. Impacts on Safety and Public Health.**

No impacts on public health are anticipated by the proposed action. The issue of safety, however, has been a matter of concern for all involved in the development of this amendment. Since commercial fishing is already considered to be one of the most hazardous occupations, primarily because of the influence of weather, any action which will constrain or otherwise affect fishermen's behavior may have impacts on the safety of those individuals.

Fishermen placed in a marginal economic position as a result of a restrictive management system, may make different decisions about going out or staying in than they would under less stressed financial situations. The direct relationship between risk, or casualty rates, and management measures, however, cannot be established. The increased competition brought upon the industry by increasing effort (including the edge given by improved technology or fishing methods), on the other hand, more directly influences the individual's decision-making process. To the extent that mis-management of the fishery allows the stocks to reach an overfished condition, a condition where competition for fish is intensified and business survivability is threatened, there is some connection between management systems and

safety.

The alternatives that are proposed were developed with safety as one of many considerations. Predicting the impacts of these measures on the safety of individuals can only be done qualitatively since there is a lack of data, and, more significantly, there is no way to predict the behavior and decision making process of individual fishermen. A measure that maximizes individual flexibility would most likely have less of a negative impact on safety than a system that creates a "derby" atmosphere, such as an aggregated quota system, in which individual vessels compete against each other for a limited amount of fish.

The framework procedures to implement the effort reduction program allows for a substantial amount of choice and should not result in induced competition between fishermen. On the other hand, if the weather is unsuitable for fishing and the operator decides to go out in any case, then the management system may be blamed for creating a situation in which safety is compromised. The risk is brought about by the imprudent decision, not by some intrinsic characteristic of the regulation.

The moratorium is also not expected to have a negative impact on public safety. While the moratorium does prohibit the issuance of new permits, vessels which qualify for a permit may be upgraded without restrictions. Thus, vessels may be upgraded or modernized and the implications relative to safety may, in fact, be positive.

This amendment is being developed at a time when a comprehensive set of regulations are being promulgated under the Commercial Fishing Vessel Safety Act of 1988, PL 100-424. While some of these regulations are not yet final, they include stability and construction standards for certain vessels, requirements for survival craft and other safety equipment, and other measures to improve the overall level of safety of the industry. How these regulations will interact with the proposed management measures cannot be predicted, but they are intended to reduce the risks inherent in commercial fishing.

## X. CONSISTENCY WITH THE NATIONAL STANDARDS

Section 301 of the MFCMA requires that any regulation promulgated to implement any FMP shall be consistent with the seven national standards listed below.

- 1) *Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.*

The definition of overfishing adopted by the Council would result in harvest levels consistent with federal guidelines on achieving optimum yield (50 CFR 602.11). The Council believes that the proposed action will allow the resource to recover from an overfished condition while minimizing impacts on fishermen. The overfishing threshold ( $F_{10\%}$ ) is defined as the fishing mortality rate, in combination with the existing management measures including the minimum legal carapace length, which results in a level of egg production per recruit which is 10% of the egg production per recruit of the unfished population. The most recent stock assessment indicates that with maintenance of the current 3¼ inch minimum carapace length and with no changes to the management measures currently in place, fishing mortality rates need to be reduced 20% in the Gulf of Maine assessment area and 50% in the inshore southern New England assessment area. In the remaining assessment area, offshore Georges Bank and south, fishing mortality rates are estimated to be at or near the overfishing threshold, indicating a fully exploited condition.

The level of fishing mortality required to achieve the maximum sustainable yield (MSY),  $F_{msy}$ , has not been evaluated. As the best available proxy for  $F_{msy}$ ,  $F_{max}$  varies slightly among assessment areas, with a weighted average of about 0.30 (Gulf of Maine,  $F_{max} = 0.29$ ; Georges Bank,  $F_{max} = 0.17$ ; SCCLI,  $F_{max} = 0.38$ ). Fishing mortality rates in all areas, including the offshore area, are above  $F_{max}$ , the level which will produce the maximum yield per recruit. To reach  $F_{max}$ , fishing mortality would have to be reduced as much as 74% from current levels. Since the primary objective of Amendment #5 is to eliminate overfishing, greater reductions in fishing mortality were not evaluated. However, on the basis of stock production models, the additional yield which may result from further reductions in fishing mortality below  $F_{10\%}$  are unlikely to outweigh the social and economic disruptions which might result.

- 2) *Conservation and management measures shall be based upon the best scientific information available.*

In developing this amendment, the NEFMC used information provided by the Stock Assessment Workshops (SAW) as well as analyses conducted by the ASMFC Lobster Scientific Committee, the Lobster Plan Development Team and the Council staff using data collected by NMFS. Appropriate, published scientific literature was referenced.

During the development of this amendment, the SAW reviewed the status of the lobster resource in the spring of 1992 and in the spring of 1993 at SAW 14 and SAW 16, respectively.

Amendment #5 includes the establishment of a mandatory collection system for landings and effort data. This will result in future management decisions being based on universally collected data rather than the current voluntary system and sampling programs. The framework system which is established by Amendment #5 will use this information to make adjustments to the management measures as necessary.

3) *To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or inclose coordination.*

The regulations proposed in this amendment apply throughout the range of the American lobster resource and to all vessels with federal lobster permits or federally endorsed state lobster permits.

Since most U.S. landings of American lobster are from state waters, the Council's role in lobster management is to coordinate cooperative effort among individual states as well as to manage American lobster in the EEZ. The measures proposed in this amendment are expected to increase uniformity in available scientific information and management practices across all states in the lobster stock.

4) *Conservation and management measures shall not discriminate between residents of different States.*

The proposed measures in Amendment #5 do not discriminate among residents of different states nor do they incorporate or rely on state statutes or regulations that discriminate against residents of other states.

5) *Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.*

The overfished condition of lobster in the Gulf of Maine and the Southern Cape Cod/Long Island Sound resource areas is largely caused by an excess of fishing gear. The increase in the number of lobster traps in the 1980's probably has reduced the net income of lobster fishermen. Amendment #5 provides a framework to reduce excessive levels of fishing gear and to improve economic efficiency.

Amendment #5 may re-allocate economic benefits to some extent, although this is not its intended purpose. For example, the amendment includes a target quota for the landing of lobsters by vessels using gear other than lobster traps and sets limits on the number of

lobsters that recreational fishermen may catch (6 lobsters per day). The purpose of the limits, however, is to slow further increases in fishing pressure while generally maintaining the historical shares caught by the various groups of fishermen.

6) *Conservation and management measures shall take into account and allow for variations among, and contingencies in fisheries, fishery resources, and catches.*

The discussions presented under the preceding three sections (management units, allocations and efficiency) reflect the Council's consideration of variations in fisheries, fishery resources and catches. Additionally, the system of management areas, effort management teams and the framework adjustment system enable the Council to develop regionally appropriate management measures and to continually take into account changes in the fishery. Public and scientific input are both integral elements of the system established by Amendment #5.

7) *Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.*

The proposed measures are expected to decrease costs of managing the fishery by providing more timely information about the resource to fishery managers. Enforcement effort and other management procedures are not expected to be negatively affected by the proposed measures.

## **XI. RELATIONSHIP TO OTHER APPLICABLE LAWS**

### **A. REGULATORY FLEXIBILITY ACT**

#### **1. Introduction.**

The measures proposed for implementation at this time under Amendment #5 will not have a significant impact on a substantial number of small business entities (although all vessels or individuals holding lobster permits are considered to be a part of small business entities). The proposed measures will not result in a reduction of annual gross revenues of more than 5 percent. Annual compliance costs are not expected to increase total costs by more than 5 percent and are not expected to be substantially higher for small as compared to large business entities. They will not force more than 2% of small business entities to cease business operations.

The economic impacts of the proposed amendment are described in section IX.B.2. The measures that would have an impact on small business entities are 1) the moratorium; 2) a "bag" limit on the number of lobsters that could be landed by recreational divers or fishermen (this impact would apply to vessels for hire that are used to convey divers or fishermen); and 3) restrictions on vessels in permit categories A and B. The amendment also provides a framework to implement fishing mortality reductions in the future, however, the appropriate impact analyses will be completed as those measures and alternatives are developed and considered for implementation.

#### **2. Moratorium.**

Although data indicate that 1,025 new federal permits which were issued to lobster trap vessels since the control date would not be renewable, it is unlikely that these permits represent a corresponding level of lobster fishing which would be displaced by the moratorium. While the pot fishery in the coastal area probably has expanded into federal waters, most of the increase in the number of federal permits is for fishermen who either already have either federal endorsements or who fish primarily in state waters. The moratorium will also affect 55 bottom trawl vessels, 21 fixed net and 10 dredge vessels. There is no information as to what extent these vessels depend on lobsters as a source of revenue. The moratorium control date, however, was published and received considerable attention in the trade press at that time.

#### **3. Restrictions on Recreational Fishermen.**

This limit of six lobsters per person corresponds to the recreational catch limit in New York and the Council believes that it will not restrict the vast majority of recreational fishermen. The limit will probably be less restrictive for charter boat operations which

generally engage in other diving activities than for private vessels whose primary goal might be to catch as many lobsters as possible. (The impact on private vessels, however, is not a consideration under the Regulatory Flexibility Act.) Party boat operations are unlikely to be impacted because, based on information received at public hearings, the number of lobster will probably be less than the six-lobster-per-person limit.

#### 4. Restrictions on Vessels in Permit Categories A and B.

As discussed in section IX.B.2., these measures are intended to maintain historical fishing patterns from before the control date and to prevent a significant shift in effort from the groundfish and scallop fishery to lobstering. The 100 lobster limit on Category A vessels would not force these vessels to discard lobsters that were caught as a bycatch rather than as a targeted species. Vessels that historically directed fishing on lobsters would not be restricted by any measures currently proposed unless total lobster landings by vessels fishing with gear other than lobster pots exceeds six percent of the 1992 landings. According to NMFS commercial fisheries weigh-out data, only about 2.5% of total commercial lobster landings were landed with gear other than lobster traps during the most recent five-year period (1988-1992) for which there is data. It is therefore unlikely that non-trap vessels will reach the six percent landings level unless there is a substantial shift in effort.

#### **B. ENDANGERED SPECIES ACT AND MARINE MAMMAL PROTECTION ACT**

Section 7 of the Endangered Species Act requires Federal Agencies conducting, authorizing or funding activities that may affect threatened or endangered marine species, to insure that those effects do not jeopardize the continued existence of any listed species. Information in this DSEIS will be used by NMFS in a Section 7 consultation to determine the level of impacts of the lobster fishery on listed species and to identify actions that may be necessary to assess and reduce those impacts. Consultation will be completed prior to publication of the FSEIS, and will be appended to the FSEIS.

NMFS has received reports of lobster gear interactions with the following list of endangered and threatened species:

##### Endangered Sea Turtle:

Leatherback sea turtle      Dermochelys coriacea

##### Threatened Sea Turtle:

Loggerhead sea turtle      Caretta caretta

##### Endangered Whales:

Humpback whale      Megaptera novaeangliae

Fin whale      Balaenoptera physalus

Northern right whale      Eubalaena glacialis

Blue whale  
Sperm whale

Balaenoptera musculus  
Physeter catodon

The lobster fishery has no known impacts on proposed right whale critical habitat (Cape Cod Bay, Great South Channel) or on harbor porpoise, which have been proposed as threatened under the Endangered Species Act.

Table XI.B.1. lists the reported interactions between sea turtles and lobster gear or 'line' from 1983 through 1992. Data from 1993 are not yet available. Table XI.B.2. lists all reported interactions between whales and lobster gear or 'line' since 1975, when the databases on whale strandings and sightings were established. Records of entanglement in line or rope similar to that used in the lobster fishery are included in Tables 1 and 2. Notations were made in the comment section regarding gear description when lobster gear was not specified. These entanglements are included here and assumed to represent lobster fishery interactions, however, in order to interpret the impacts of the lobster fishery conservatively.

### 1. Sea Turtle Interactions.

Sea turtle interactions were reported primarily by participants in the Sea Turtle Stranding and Salvage Network (STSSN). Strandings are likely the result of inshore gear interactions. All live entanglements observed occurred in state waters. New York, Connecticut and Massachusetts deploy observers in the lobster fishery, although observer effort is low. An observer in New York reported one entanglement. None have been reported by Connecticut or Massachusetts observers.

Although known takes of sea turtles have been documented only in state waters, many fishermen fishing in state waters are permitted under the American Lobster Fishery Management Plan. All documented interactions, therefore, are assumed to be the result of activities conducted under Federal permits and requiring Endangered Species Act Section 7 scrutiny.

Forty four sea turtles have been reported in interactions with lobster gear between 1983 and 1992. Forty two of these interactions involved endangered leatherback sea turtles. Two interactions in New Jersey involved threatened loggerhead turtles. Eighteen of these interactions, including both loggerhead turtles, resulted in mortalities. Zero to nineteen sea turtle entanglements were reported in each year, with an average of 4.4 entanglements per year between 1983 and 1992. Excluding high levels of interactions reported in 1987 and 1988, the average annual number of entanglements reported was 1.75.

The largest number of entanglements were reported in 1987 and 1988, when eleven and nineteen leatherback entanglements were reported respectively. Twenty five of the thirty leatherback entanglements reported for these two years were reported in Massachusetts by

Stranding Network members working with the Wellfleet Bay Wildlife Sanctuary. Sanctuary staff actively solicited entanglement reports in 1987 and 1988. It is unclear whether these numbers represent the annual level of interactions in inshore Massachusetts waters, or represent two years of high leatherback abundance. Twenty of the 25 leatherbacks were alive when observed, and some were released by fishermen. Efforts to preserve their gear and haul it aboard safely provide fishermen with opportunity and motive to disentangle leatherback sea turtles alive.

## **2. Whale Interactions.**

Inconsistent reports on sightings and strandings of whales have been collected since 1975, with more regular reporting since 1980. Thirty reports of whales entangled in lobster gear or line have been recorded in the 19 years since 1975 (Table XI.B.2.). The thirty reports include 18 humpback whales (1 dead), 6 fin whales (1 dead), 3 right whales, 2 sperm whales (both dead) and 1 blue whale. While only four of these whales were observed dead, mortalities offshore are not likely to result in observed strandings.

Whale watching and stranding network efforts were well established by 1980. The annual range of whale entanglements in lobster gear or line reported in those years was from zero to four whales, with an average of 1.9 whales, including an average of one humpback whale reported entangled per year. Fishery observer data cannot be used to supplement records regarding the impact of the lobster fishery on whales due to the ability of large whales to remove fixed gear from its original location.

## **3. Conclusions.**

Takes of endangered and threatened species of whales and sea turtles by lobster gear have been documented. The Council believes, however, that the lobster fishery is not likely to jeopardize the continued existence of any listed species. Actions proposed in Amendment 5, and other management actions implemented by the American Lobster Fishery Management Plan, will have no known impacts on listed species. The establishment of logbook reporting requirements may result in improved data collection regarding sea turtle interactions with lobster gear. Consultation, required by Section 7 of the Endangered Species Act, is ongoing, and will be completed and appended to the FSEIS.

Table XI.B.1. Sea Turtle / Lobster Gear Entanglement Reports

Year	Month	State	STSSN Number	Species	Comments
1983	Jul	NEW JERSEY	RCS830725	LOGGERHEAD	Dead
1984	Aug	MASSACHUSETTS	PXB840824	LEATHERBACK	Live
	Oct	MASSACHUSETTS	GXA841015	LEATHERBACK	Dead
	Nov	MASSACHUSETTS	BXL841105	LEATHERBACK	Dead
1985	Jul	MASSACHUSETTS	REM850705	LEATHERBACK	Live
1986	Aug	NEW YORK	XXG860813	LEATHERBACK	Dead
	Aug	RHODE ISLAND	MTA860803	LEATHERBACK	Dead
	Sep	MASSACHUSETTS	EXM860924	LEATHERBACK	Dead
1987	Aug	MASSACHUSETTS	KXS870816	LEATHERBACK	Live
	Aug	MASSACHUSETTS	AXY870818	LEATHERBACK	Live
	Aug	MASSACHUSETTS	CXM870818	LEATHERBACK	Live
	Aug	MASSACHUSETTS	PXY870821	LEATHERBACK	Live
	Aug	MASSACHUSETTS	WXB870824	LEATHERBACK	Live
	Sep	MASSACHUSETTS	TXG870913	LEATHERBACK	Live
	Sep	MASSACHUSETTS	XXX870930	LEATHERBACK	Live
	Oct	MASSACHUSETTS	JXB871996	LEATHERBACK	Dead
	Oct	MASSACHUSETTS	BXD871007	LEATHERBACK	Dead
	Oct	NEW JERSEY	MMS871007	LEATHERBACK	Live
	Oct	MASSACHUSETTS	BXL871031	LEATHERBACK	Dead
1988	Jun	MASSACHUSETTS	AXM880625	LEATHERBACK	Live, disentangled 4 days after discovery
	Jun	MASSACHUSETTS	EXB880621	LEATHERBACK	Coast Guard observed turtle dragging pot line, cut gear.
	Jul	CONNECTICUT	XXS880719	LEATHERBACK	Live, freed by fisherman.
	Jul	NEW YORK	SXM880704	LEATHERBACK	Live, rope and 2 buoys removed.
	Jul	MASSACHUSETTS	SCC880705	LEATHERBACK	Front flippers damaged, fresh dead
	Jul	MASSACHUSETTS	SCC880707	LEATHERBACK	Live, tangled in 2 pot lines.
	Jul	MASSACHUSETTS	CCS880710	LEATHERBACK	Live, entangled in pot line with 1 buoy attached.
	Jul	MASSACHUSETTS	MXP880715	LEATHERBACK	Live
	Jul	MASSACHUSETTS	PXR880715	LEATHERBACK	Live, one of 2 pot lines removed.
	Jul	MASSACHUSETTS	AXM880717	LEATHERBACK	Live, freed from 2 pot lines.
	Jul	MASSACHUSETTS	SCC880728	LEATHERBACK	Euthanized.

Table XI.B.1. (Continued) Sea Turtle / Lobster Gear Entanglement Reports

Year	Month	State	STSSN Number	Species	Comments
1988	Aug	NEW JERSEY	MMS880829	LEATHERBACK	Heavy lobster pot? poly-pro line around flippers, head, carapace.
	Aug	MASSACHUSETTS	DXE880817	LEATHERBACK	Live.
	Aug	MASSACHUSETTS	BXA880819	LEATHERBACK	Live, freed from 2 pot lines with buoys.
	Aug	MASSACHUSETTS	DXB880919	LEATHERBACK	Fresh dead, entangled in 2 pot lines.
	Aug	MASSACHUSETTS	AXM880825	LEATHERBACK	Live, freed from pot line and buoy.
	Sep	MASSACHUSETTS	SCG880924	LEATHERBACK	Live.
	Oct	NEW JERSEY	MMS881002	LEATHERBACK	Entangled in yellow, poly-pro line.
	Oct	MASSACHUSETTS	JXB881020	LEATHERBACK	Live.
1989	Apr	RHODE ISLAND	RXN890406	LEATHERBACK	Nylon pot line wrapped around right front flipper.
1991	Jul	MASSACHUSETTS	TXL910704	LEATHERBACK	Both front flippers in line.
	Jul	NEW JERSEY	MMS910720	LOGGERHEAD	Right front flipper entangled in pot line, freed by divers. Left floating dead.
1992	Aug	NEW YORK	PXL920818	LEATHERBACK	Stomach filled with jellyfish.
	Aug	RHODE ISLAND	JBS920806	LEATHERBACK	Live. Turtle disentangled itself from pot line.
	Oct	MASSACHUSETTS	JXA921027	LEATHERBACK	Left front flipper constricted by rope, euthanized.

Table XI.B.2. Endangered Whale Entanglement Reports Involving Lobster Gear or Line.

Year	Month	State	Reporter	Species	Comments
1975	Nov	MAINE	NEW ENGLAND AQUARIUM	FIN WHALE	Alive, 'line' through mouth and flipper. Freed.
1976	Jul	NEW JERSEY	MARINE MAMMAL STRANDING CENTER	HUMPBACK WHALE	Alive, lobster pots removed from line around body.
1978	Dec	NEW JERSEY	MARINE MAMMAL STRANDING CENTER	SPERM WHALE	Dead on beach, 'lobster pot line' around lower jaw.
1979	Jul	MAINE	MARINE MAMMAL EVENTS DBASE	HUMPBACK WHALE	Alive, calf, 'rope' trailing from mouth.
1981		NEW YORK	OKEANOS	FIN WHALE	Alive, disentangled from lobster lines.
	May	MASSACHUSETTS	WOODS HOLE OCEANOGRAPHI C	HUMPBACK WHALE	Alive, heavy line wrapped around body, mouth and left flipper.
	Jul	NEW YORK	MARINE MAMMAL EVENTS DBASE	FIN WHALE	Alive, fisherman reported whale entangled in lobster gear, towing marker and buoys.
	Sep	NEW BRUNSWICK, CANADA	NEW ENGLAND AQUARIUM	HUMPBACK WHALE	Alive, juvenile, trailing lobster gear.
1983	May	MASSACHUSETTS	NEW ENGLAND AQUARIUM	RIGHT WHALE	Alive, escaped from entanglement in lobster gear.
1984	Jul	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	FIN WHALE	Alive, towing lobster pots and buoys, Cape Cod Bay.
	Oct	MASSACHUSETTS	MARINE MAMMAL EVENTS DBASE	HUMPBACK WHALE	Alive, calf (with mother) towing lobster lines and floats.
1985	Mar	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	FIN WHALE	Alive, emaciated, 'rope' wrapped around head and across back.
	May	MAINE	NEW ENGLAND AQUARIUM	RIGHT WHALE	Alive, tethered to poly-pro line with floats in Boothbay, released.
1986	Aug	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	HUMPBACK WHALE	Alive, rope around body and strapping mouth shut. Unable to disentangle.
	Aug	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	RIGHT WHALE	Alive, cow with line through the mouth and around head. Stellwagen Bank.

Table XI.B.2. (continued) Endangered Whale Entanglement Reports Involving Lobster Gear or Line.

Year	Month	State	Reporter	Species	Comments
1987	Aug	MASSACHUSETTS	CETACEAN RESEARCH UNIT	BLUE WHALE	Alive, rope around flipper with buoy ('probably lobster') attached.
1988	May	MASSACHUSETTS		HUMPBACK WHALE	Alive, entangled in line. Freed. Cape Cod Bay.
	Jun	MASSACHUSETTS	CETACEAN RESEARCH UNIT	HUMPBACK WHALE	Alive, loop of line and float around tail stock. Resighted Sep 3 and 8.
	Nov	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	HUMPBACK WHALE	Alive, trailing 9 lobster pots. Cape Cod Bay.
1989	Sep	NEW JERSEY	MARINE MAMMAL STRANDING CENTER	HUMPBACK WHALE	Dead, 3/4" Poly-Pro line around body, and 3/4" cable.
1990	Apr	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	HUMPBACK WHALE	Alive, fisherman reported whale dragging '100'S of yards of lobster gear. Most removed.
	Jun	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	HUMPBACK WHALE	Alive, line through mouth. Northern Stellwagen.
	Jul	MAINE	NEW ENGLAND AQUARIUM	HUMPBACK WHALE	Alive, lobster gear trailing. Portsmouth harbor.
1991	Jan	MASSACHUSETTS	NEW ENGLAND AQUARIUM	FIN WHALE	Dead on Tuckernuck Island with 1/2" poly-pro through mouth.
	Aug	NEW YORK	OKEANOS	HUMPBACK WHALE	Alive, disentangled from lobster gear.
	Oct	MASSACHUSETTS	NEWSPAPER	HUMPBACK WHALE	Alive, disentangled by lobsterman off Nahant.
1992	Apr	MASSACHUSETTS	CETACEAN RESEARCH UNIT	HUMPBACK WHALE	Alive, 3/4" - 1" line across back.
1993	Apr	MASSACHUSETTS	CENTER FOR COASTAL STUDIES	HUMPBACK WHALE	Alive, weakened, wounds healing around line. Disentangled.
	Aug	MAINE	COAST GUARD	HUMPBACK WHALE	Alive, entangled in 'line'.
	Aug	MAINE	COLLEGE OF THE ATLANTIC	SPERM WHALE	Decomposed, line around lower jaw.

## **C. COASTAL ZONE MANAGEMENT ACT**

The Council has submitted Amendment #5 to the American Lobster FMP to the Coastal Zone Management Programs of coastal states from Virginia to Maine, inclusive, for review. Copies of the transmittal letters that have the Council's determination of whether the proposed measures are consistent with the coastal zone management plans for the individual states are contained in Appendix C.

### **1. Effects on the Coastal Zone.**

Amendment #5 is consistent with CZM programs of the Northeast and Mid-Atlantic coastal States. Amendment #5 is not expected to cause an increase in any activities which adversely impact the coastal zone.

### **2. Effects on Flood Plains or Wetlands.**

Amendment #5 is not expected to have any affect on flood plains or wetlands, and trails and rivers listed or eligible for listing on the National Trails and Nationwide Inventory of Rivers.

## **D. PAPERWORK REDUCTION ACT**

### **1. Supporting Statement for Revisions to OMB Approval Number 0648-0202 Permit Family of Forms.**

#### **a. Introduction.**

Under the Magnuson Fishery Conservation and Management Act (MFCMA), the Secretary of Commerce is authorized to adopt such regulations as may be necessary to carry out the conservation and management objectives of Fishery Management Plans (FMPs). Amendment #5 to the FMP for the American Lobster Fishery was developed by the New England Fishery Management Council in consultation with the Mid-Atlantic Fishery Management Council (MAFMC), the National Marine Fisheries Service (NMFS) and the Atlantic States Marine Fisheries Commission (ASMFC) to prevent inconsistent minimum lobster regulations in state and federal waters and to eliminate any overfishing of the lobster resource. The amendment establishes a moratorium on federal lobster permits, a mandatory data collection program, effort management teams (EMTs) for recommending fishing mortality reduction measures in several management areas, and includes a revised overfishing definition, a framework process and a time schedule for reducing overfishing where necessary.

Given the high commercial value of American lobsters, the incentive to circumvent regulations is strong. A comprehensive system which monitors all fishing and landings is necessary for successful implementation and adjustment of the management measures which

will eliminate overfishing. Permits issued to all vessels which land lobsters and to all domestic American lobster dealers provide the foundation of this accounting system, as well as a strong tool for enforcement since permits can be revoked for serious violations of the regulations. The regulations will also require vessel operators to obtain a permit to enhance compliance by vessel operators who are not vessel owners.

In the past there have been no limits on the number of vessel permits, however, uncontrolled fishing effort has caused overfishing in the Gulf of Maine and Southern Cape Cod/ Long Island Sound resource areas. Under the moratorium there will be three categories of limited access permits based on past fishing activity. Category A is for vessels fishing with gear other than lobster pots and which qualify under the rules of the moratorium but which cannot document landings of at least 300 pounds of lobster on one trip prior to the control date. These vessels will be restricted to possessing no more than 100 lobsters at any time. Category B is for vessels fishing with gear other than lobster pots and which qualify under the rules of the moratorium and which can document landings of at least 300 pounds of lobster on one trip prior to the control date. These vessels will be restricted to possessing no more than 100 lobsters at any time. Category C is for vessels that fish with lobster pot gear and which qualify under the moratorium. Vessels in categories B and C may be subject to fishing mortality reduction measures in the future.

Owners of the many vessels which in the past participated voluntarily in NMFS data-collection programs will not have the burden of documenting past fishery participation since NMFS possesses data to verify their American lobster landings. Other vessel owners, however, will be required to submit documents (sales receipts, dealer weigh-out forms, etc.) to prove their eligibility for a limited access permit and possibly establish their permit category.

This submission requests revision of Office of Management and Budget (OMB) approval for existing NMFS Northeast Region requirements previously approved under Control #0648-0202, Permits. That submission currently covers the Northeast Region's permit requirements for fishing vessels and dealers. This submission extends the existing requirements to include three permit requirements contained in Amendment #5 to the Atlantic American Lobster FMP: (1) dealer permits, (2) vessel operator permits (8) vessel permits and limited access permit appeals.

#### **b. Justification.**

**Why is the information necessary?** The issuance of a permit is an essential component of the management of the American lobster fishery. The purposes of permits are to: (1) limit the vessels in the fishery, (2) register lobster vessels, operators and dealers; (3) list characteristics of fishing vessels and dealers, (4) exercise influence over compliance by withholding issuance until collection of unpaid penalties, (5) provide a mailing list for the distribution of important information to the industry, and (6) provide a universe for data

collection samples.

The conservation measures proposed in Amendment #5 will be undercut if fishing effort increases in overfished resource areas, so a limited access permits system is needed. Lobster vessels will report their landings and all dealers will report their purchases of American lobsters. Reporting is required from both of these groups to cross check landings data and to increase the effectiveness of the management program. The issuance of permits to dealers as well as vessels is necessary to ensure that data collection covers the entire fishery. The possible revocation of these permits also will help to ensure compliance with reporting requirements. The dealer permit application is unchanged except for the addition of the permit category for American lobsters.

The amendment requires vessel operators to obtain a permit so that they may more effectively held responsible for fishing in compliance with the regulations. The potential for revocation of the permit, which is required to operate a federally-permitted American lobster vessel, will provide a disincentive to the operator to commit violations. The application is a new form which will require name, mailing address, telephone number, height, weight, hair color, eye color and signature; social security number will be provided at the option of the applicant. Two photographs must be submitted with the application and a photo identification will be made for the operator.

The vessel permit application remains unchanged from that approved by OMB on July 28, 1992, except that the new lobster permit categories are added.

**How, and by whom, will the information be used?** The information requested on the permit application forms will be used by several offices of NMFS, the NEFMC and the MAFMC to evaluate the management program and future management proposals. In most cases, aggregated summaries are made available, but for law enforcement, mailings, or resource allocation problems individual permit information is often required. The vessel operator permit system will improve the flow of information within the industry by enabling NMFS to notify operators as well as vessel owners of proposed or approved regulatory changes.

Dealer information is also used by enforcement officers to check for regulatory infractions, and by NOAA scientists and economists as a basis for data sampling. The dealer permit requirement ensures complete reporting from the fishery. The reports provide important information on the volume, value and distribution of American lobsters at the point of first purchase.

The information obtained from the vessel monitoring system is critical to achievement of the fishing mortality targets established by the amendment. Data will be obtained to quantify actual fishing effort. Fishing effort information is needed to standardize differences in productivity among vessels or fishing grounds by establishing a rate of catch per unit time.

This allows comparisons over time and space of catches made by a variety of harvesters. Comparisons of catch and catch per unit effort (CPUE) over time are significant indicators of the biological status of the fishery.

In addition to the uses specifically relating to American lobster management, the data collected through the effort monitoring will be incorporated into the NMFS databases which are used in many analyses by NMFS offices, the Regional Fishery Management Councils, the states, the Departments of State and Commerce, OMB, the Corps of Engineers, Congressional staffs, the fishing industry, and the public.

**Can improved technology reduce the burden?** After the initial permit issuance, permit renewal has been made as simple as possible for both the public and the issuing office. The information obtained from current permits is used to prepare a computer-generated pre-printed renewal permit which is sent to the permit holder for updating. If there is no change to the information required on the permit, renewal requires no more than a signature from the applicant. This minimizes the reporting burden on the public as well as the administrative burden on the agency. No improved information collection technology has been identified to reduce this burden further. Every effort will be made in the future to use computer technology to reduce the public burden.

**Describe any duplication of effort.** The information to be collected through the issuance of permits or through vessel monitoring is not duplicated elsewhere.

**Could existing information be modified to meet these needs?** There is no current source of this information which is needed to implement and enforce the proposed management measures.

**How are impacts on small businesses minimized?** Since all lobster fishermen are considered to be engaged in small businesses, separate requirements based on the size of business have not been developed. One of the most important features of the proposed collection is that it is comprehensive, and includes all vessels with federal permits.

**Could the collection be conducted less frequently?** Annual permit renewal will be required for vessel, dealer and operator permits. Annual permits allow NMFS to use the most accurate information available for enforcement and to measure the effects of fishing on living resources.

**Explain if request is not consistent with 5 CFR 1320.6 guidelines.** The data collection is consistent with 5 CFR 1320.6 guidelines, except that the vessel monitoring system requires information to be reported more frequently than quarterly. The need for this is described in Item 7.

**Describe efforts to get comments from outside the agency.** Public hearings were

held on all of the proposed measures in the Amendment in the major lobster ports and lobster producing regions. Hearings were held in Ellsworth, ME, Rockland, ME, Portland, ME, Portsmouth NH, Peabody, MA, Buzzards Bay, MA, Galilee, RI, East Lyme, CT, Ronkonkoma, NY, and South Wall, NJ. Public comments are summarized in an Appendix to the FMP. Public agencies consulted included: NOAA/NMFS, USFWS, and fisheries agencies in all the Northeast coastal states from New Jersey through Maine.

**Describe any assurances of confidentiality.** All data will be kept confidential as required by NOAA Directive 88-30, Confidentiality of Fisheries Statistics, and will not be released for public use except in aggregate statistical form without identification as to its source. Confidentiality is also required by Section 303(d) of the MFCMA.

**Provide justification for any questions of a sensitive nature.** There are no questions of a sensitive nature.

**Provide estimates of annualized costs to the Federal Government and to the respondents (See table following text).** The American lobster vessel permit is not new to this Amendment so there is no new burden associated with the existence of the permit. Dealer and operator permits are new to this FMP so the number of individuals in both categories must be estimated. Individuals involved in the preparation of the FMP and knowledgeable about the industry estimate that there are no more than 500 lobster dealers. (In Maine there are 105 dealers who buy from five or more vessels). The number of vessel operators has been estimated at 6,870 - the number of federal or federally endorsed state permits in 1993 minus those that were issued after the moratorium control date. The cost calculation for these permits assumes a respondent wage and overhead value of \$15/hour. It also assumes that the average cost to the government of permit issuance is \$33/permit based on the most recent Northeast Region cost analysis (includes labor, printing, distribution, computer time and handling). The Northeast Region may implement a fee system to allow recovery of a significant portion of these costs as allowed under MFCMA.

The reporting burden also includes the possibility that vessel owners may appeal two aspects of their permit in this limited access fishery: (1) exclusion from the fishery under the proposed moratorium, and (2) permit category classification for all vessels not fishing with lobster pots.

The first type of appeal would be made in response to an agency determination that a vessel is ineligible for a limited access permit. Of the vessels currently holding a federal lobster permit, 1,544 will not qualify for any of the limited access permit categories. If an estimated 20% of these vessels appeal their exclusion under the moratorium, 322 must go through the appeals process. On average, applicants are expected to spend 3 hours gathering and presenting the documentation needed. The government is expected to spend one hour of time at the GS-9 level (\$18.86 including overhead) to review each appeal and one hour at the GS-12 level (\$27.35) each appeal hearing. Additionally telephone, handling and travel costs

are estimated to be about \$25 per appeal. Therefore, total estimated cost to the government per appeal is about \$71. The cost to the public is estimated at \$15/hour.

The second type of appeal would be made in response to the vessel permit category to which the vessel is assigned. The number of such appeals could be as high as 1,000. On average these appellants might spend 5 hours gathering and presenting the documentation needed. Cost to the government is estimated at \$71/appeal; cost to the public is estimated at \$15/hour.

Information Need	Number of Entities	Items per Entity	Total Number of Items	Response Time (hr)	Total Burden Hours	Cost to Public (\$US)	Cost to Government (\$US)
Dealer Permit	500	1	500	0.083	42	630	16,500
Operator Permit	6,870	1	6,870	1.0	6,870	103,050	226,710
Limited Access Permit Appeals	322	1	322	3.0	966	14,490	22,862
Vessel Permit Category Appeals	1,000	1	1,000	5.0	5,000	75,000	71,000

**Provide estimates of the burden of the collection on the public (See table following text).** The calculation of the burden of this collection on the public assumes that it takes five minutes to complete the dealer permit. The operator permit application is estimated to take an average of 1 hour due to the requirement to submit color photos.

The burden of assembling proof of eligibility for a limited access permit is estimated at 3 hours. The burden of assembling information to appeal the vessel category classification is estimated to be 5 hours per appeal.

**Explain potential changes in burden.** All burden figures are based on the estimated number of individuals affected. The actual number of dealers, vessel operators, and appeals may differ from these estimates.

**Describe plans for any statistical use of the information.** Results from this collection may be used in scientific, management, technical or general informational publications such as Fisheries of the United States and Fisheries Statistics of the United States, both of which follow prescribed statistical tabulations and summary table formats. Data are available to the general public on request in summary form only; data are available to NMFS employees in detailed form on a need-to-know basis only.

**c. Collection of Information Employing Statistical Methods.**

No statistical methods are employed in the information collection procedures.

## **2. Supporting Statement for Logbook Requirements in the American Lobster Fishery 0648-0212.**

### **a. Introduction.**

Under the Magnuson Fishery Conservation and Management Act (MFCMA), the Secretary of Commerce is authorized to adopt such regulations as may be necessary to carry out the conservation and management objectives of Fishery Management Plans (FMPs). The New England Fishery Management Council, the Mid-Atlantic Fishery Management Council, and the National Marine Fisheries Service (Northeast Region) agree that mandatory reporting by both dealers and vessel operators will be a necessary aspect of most, if not all, future management plans. A comprehensive system which accounts for all fishing activity and landings is necessary to enforce and monitor management measures intended to eliminate overfishing. An essential component of this system is mandatory logbook reporting by commercial vessel operators.

The Tier Two logbook currently approved for use in the groundfish and summer flounder fisheries will be modified slightly to make it suitable for use in most Northeast Region fisheries. These modifications are presented as part of the submission for Amendment 5 to the FMP for American lobsters and for OMB review.

The logbook was developed for use in most Northeast Region fisheries (because of individual transferrable quotas, a separate logbook will continue to be used in the surf clam and ocean quahog fisheries) and suggestions and comments were obtained from staff of the New England and Mid-Atlantic Fishery Management Councils, members of both Councils (representing various aspects of the industry), staff of the Northeast Fisheries Science Center, and staff of the Northeast Regional Office. The standardization of the logbook resulted in the revision of some elements and the addition or deletion of others.

Specifically, the element requiring "number of tows/sets" has been re-worded as "number of hauls" so that it is applicable to a wide range of fisheries.

The following elements are added: (1) US Coast Guard or state registration number; (2) time sailed; (3) request for operators to provide latitude/longitude of fishing area if Loran coordinates are not available; (4) time landed; (5) operator's permit number (if required by the specific fishery management plan); (6) operator's signature. The following elements are deleted: (1) days fished and (2) market size of species caught.

The elements listed above were added or deleted for a variety of reasons. Coast Guard or state registration numbers are added as a cross-check in case vessel permit number is omitted or entered incorrectly. Days fished was removed because a more accurate way to obtain this critical information is by requesting the date/time sailed and date/time landed (days fished will be calculated by the computer program). The log was revised to allow

vessels which don't have Loran to provide coordinates by referring to longitude/latitude coordinates. The operator's permit number was added because it will be required under the new lobster regulations; operator's signature was required as a certification of the accuracy of the log entries. Market size of species was deleted because the vessel log is not the most accurate way to obtain size information--programs such as the sea sampling program can obtain much more accurate data.

Several modifications have been made based on suggestions from summer flounder vessel operators who have used the existing logbook. They report that it is not uncommon to sell part of the catch to one dealer and part to another dealer in a different port. Discussion with industry indicates that this is common in other fisheries as well so the logbook has been modified to enable the operator to record several dealer names/numbers and two ports.

This submission requests revision of Office of Management and Budget (OMB) approval for logbook reporting requirements for fishing vessels, previously approved under #0648-0212. Approval is sought as part of the submission of Amendment 5 to the FMP for American lobsters, which was developed by the New England Fishery Management Council in consultation with the Mid-Atlantic Fishery Management Council (MAFMC) and the Atlantic States Marine Fisheries Commission (ASFMC) to eliminate any overfishing of the lobster resource. The amendment provides a comprehensive management measures to prevent inconsistent minimum lobster regulations in state and federal waters and to eliminate any overfishing of the lobster resource. The amendment establishes a moratorium on federal lobster permits, a mandatory data collection program, effort management teams (EMTs) for recommending fishing mortality reduction measures in different management areas, and includes a revised overfishing definition, a framework process and a time schedule for reducing overfishing where necessary. Mandatory logbook reporting by commercial vessel operators also is one of the proposed management measures. The revision will not increase the burden estimate of 5 minutes/response because the required information is already collected in the normal course of fishing.

**b. Justification.**

**Why is the information necessary?** Amendment 5 to the Lobster FMP requires that all lobster vessels report their landings to corroborate the information submitted through the mandatory dealer reports. This cross-check improves the accuracy of the information collected, and increases the chances of management efforts succeeding.

**How, and by whom, will the information be used?** The information collected using these logbooks will be used by the New Fishery Management Council, the states, several offices of NMFS, and the Mid-Atlantic Management Council to monitor the American lobster fishery so that conservation and management actions may be taken in a timely manner. The landings information they will provide is critical to accurate monitoring of fishing mortality targets for American lobster. Data will also be obtained to quantify actual fishing effort.

Fishing effort information is needed to standardize differences in productivity among vessels or fishing grounds by establishing a rate of catch per unit time. This allows comparisons over time and space of catches made by a variety of harvesters. Comparisons of catch and catch per unit effort (CPUE) over time are significant indicators of the biological status of the fishery.

In addition to the uses specifically relating to American lobster management, the statistics collected through these reports will be incorporated into the NMFS databases which are used in many analyses by NMFS offices, the Regional Fishery Management Councils, the states, the Departments of State and Commerce, OMB, the Corps of Engineers, Congressional staffs, the fishing industry, and the public.

**Can improved technology reduce the burden?** No improved information technology has been identified as a practical means of reducing the burden on the public at this time. Every effort will be made in the future to use computer technology to reduce the public burden as the opportunity and technology allow.

**Describe any duplication of effort** In a fishery managed on the basis of controlling fishing mortality, verification of landings is required, and will be accomplished by checking vessel logs against dealer reports and boardings at sea. NMFS has established an ongoing cooperative statistics program to work with most coastal states on data issues. For states with existing logbook programs, if all required data are collected on the state logbooks, these submissions will be accepted as meeting the federal needs. For example, NMFS has in the past accepted logbooks from Connecticut, Massachusetts, and New Hampshire logbook programs to fulfill data requirements relating to pound nets and shellfish vessels.

**Could existing information be modified to meet these needs?** There are no other existing sources of logbook information, other than state logbooks as mentioned in Item 4, though the information required is already collected by vessels in the course of their fishing operations.

**How are impacts on small businesses minimized?** Since all lobster fishermen are considered to be engaged in small businesses, separate requirements based on the size of business have not been developed. One of the most important features of the proposed collection is that it is comprehensive, and includes all vessels with lobster permits.

**Could the collection be conducted less frequently?** The frequency of reports has been kept to the minimum required for effective effort management. Since the weekly dealer reports are the critical reporting component for monitoring landings, vessel logbooks will be required only monthly. However, less frequent collection would jeopardize the value of the vessel logbooks as a cross-check on the information provided by the dealers.

**Explain if request is not consistent with 5 CFR 1320.6 guidelines.** The data

collection is consistent with 5 CFR 1320.6 guidelines except that it requires information to be reported more frequently than quarterly. The need for this is described in Item 7.

**Describe efforts to get comments from outside the agency.** Public hearings were held on all of the proposed measures in the Amendment in the major lobster ports and lobster producing regions. Hearings were held in Ellsworth, ME, Rockland, ME, Portland, ME, Portsmouth NH, Peabody, MA, Buzzards Bay, MA, Galilee, RI, East Lyme, CT, Ronkonkoma, NY, and South Wall, NJ. Public comments are summarized in an Appendix to the FMP. Public agencies consulted included: NOAA/NMFS, USFWS, and fisheries agencies in all the Northeast coastal states from New Jersey through Maine.

**Describe any assurances of confidentiality.** All data will be kept confidential as required by NOAA Directive 88-30, Confidentiality of Fisheries Statistics, and will not be released for public use except in aggregate statistical form without identification as to its source. Confidentiality is also required by Section 303(d) of the MFCMA.

**Provide justification for any questions of a sensitive nature.** There are no questions of a sensitive nature.

**Provide estimates of annualized costs to the Federal Government and to the respondents.** It is estimated that 6,870 vessels (the number of federal or federally endorsed state permits in 1993 minus those that were issued after the moratorium control date) will submit monthly logbooks and that the time to complete the logbook is 5 minutes. Respondent cost is calculated based on a respondent wage and overhead value of \$15/hour and a mailing cost of \$0.29/report. Cost to the federal government assumes an average cost of printing, distribution, and handling of \$25/respondent burden hour, based on data derived from 1981-87 logbook reporting to Northeast Region NMFS. The results of these calculations are shown in the table below.

**Calculation of Public and Federal Estimate of Reporting Burden Hours and Costs (\$US)**

Number of Respondents	Number of Reports (monthly)	Total Number of Responses	Response Time	Total Hours	Cost to Public	Cost to Government
6,870	12	82,440	0.08	6,595	98,925	164,875
Mailing costs (public only)					23,907	
Total					122,832	164,875

**Provide estimates of the burden of the collection on the public.** As indicated in the table above, the burden of this collection on the public is estimated to be 6,595 hours. The estimated time for completing the logbook is 5 minutes. This estimate may seem low unless one remembers that much of the information being provided is already collected in the normal course of fishing activity (fishing location, catch). While the vessel logbook

information is collected on a trip by trip basis, the burden calculation is based on the required monthly submission.

**Explain potential changes in burden.** These burden estimates are based on estimates of the number of respondents and should those estimates differ significantly from actual figures the burden figures will change.

**Describe plans for any statistical use of the information.** Results from this collection may be used in scientific, management, technical or general informational publications such as Fisheries of the United States and Fisheries Statistics of the United States, both of which follow prescribed statistical tabulations and summary table formats. Data are available to the general public on request in summary form only; data are available to NMFS employees in detailed form on a need-to-know basis only.

**c. Collection of Information Employing Statistical Methods.**

No statistical methods are employed in the information collection procedures.

**3. Supporting Statement for Dealer Purchase Reports in the American Lobster Fishery 0648-0229.**

**a. Introduction.**

Under the Magnuson Fishery Conservation and Management Act (MFCMA), the Secretary of Commerce is authorized to adopt such regulations as may be necessary to carry out the conservation and management objectives of Fishery Management Plans (FMPs). The New England Fishery Management Council, the Mid-Atlantic Fishery Management Council, and the National Marine Fisheries Service (Northeast Region) agree that mandatory reporting by both dealers and vessel operators will be a necessary aspect of most, if not all, future management regimes. A comprehensive system which accounts for all fishing activity and landings is necessary to enforce and monitor management measures intended to eliminate overfishing. An essential component of this system is mandatory reporting by dealers permitted to purchase regulated species.

This submission is made as a part of Amendment #5 to the FMP for American Lobster, which was developed by the New England Fishery Management Council in consultation with the Mid-Atlantic Fishery Management Council (MAFMC) and the Atlantic States Marine Fisheries Commission. The amendment provides comprehensive management measures to prevent inconsistent minimum lobster regulations in state and federal waters and to eliminate any overfishing of the lobster resource. The amendment establishes a moratorium on federal lobster permits, a mandatory data collection program, effort management teams (EMTs) for recommending fishing mortality reduction measures in

different management areas, and includes a revised overfishing definition, a framework process and a time schedule for reducing overfishing where necessary. Mandatory reporting by lobster dealers is one of the proposed management measures.

The submission requests revision of Office of Management and Budget (OMB) approval for dealer reporting requirements, previously approved under #0648-0229. There are no changes to the approved form or to the burden estimate of 2 minutes/response. The revision is submitted to reflect the extension of the mandatory requirement to lobster dealers.

**b. Justification.**

**Why is the information necessary?** Data collection systems currently in use by the Federal and State governments do not encompass all fishermen, and often include estimated landings and values. Amendment #5 to the lobster plan requires vessel operators to report their landings and also requires dealers to report their purchases of lobster. Reporting is required from both of these components of the industry in order to cross-check records between these groups to further the accuracy of the information collected, and increase the chances of management efforts succeeding.

The approved FMP for summer flounder and the approved amendments for Atlantic sea scallop and the Northeast Multispecies FMPs will require mandatory dealer reports using the dealer weigh-out form (NOAA Form 88-30) which is used widely throughout the industry in the northeast on a voluntary basis. This submission extends the mandatory reporting requirement to dealers permitted to purchase lobster. The form is currently provided to many dealers, who use it in their business accounting systems.

Under the voluntary system, dealers complete a form each time they make a purchase from a vessel--they complete portions of the top of the form pertaining to the transaction (dealer name, dealer number, address, data, port landed, state, vessel name and number) and fill in the landings information on the lower part of the form. The completed forms are then copied by NMFS statistical agents, who obtain the fishing trip information on the top portion of the form from either vessel logbooks or voluntary vessel interviews which they conduct.

Under Amendment #5 dealers will continue to use NOAA Form 88-30, however, weekly submission of weigh-out forms will be required. Dealers will be required to report all species purchased to account for all landings being handled by federally-permitted dealers. Vessel logbooks will be cross-checked with dealer reports to provide vessel information.

**How, and by whom, will the information be used?** The information collected using these forms will be used by several offices of the NEFMC, NMFS, and the MAFMC, to monitor the lobster fishery so that conservation and management actions may be taken

in a timely manner. Accurate and timely reports of landings are particularly critical for monitoring the commercial landings and evaluating the effectiveness of the FMP.

In addition to these uses specifically relating to lobster management, the statistics collected through these reports will be incorporated into the NMFS databases which are used in many analyses by NMFS, the Regional Fishery Management Councils, the states, the Departments of State and Commerce, OMB, the Corps of Engineers, Congressional staffs, the fishing industry, and the public.

**Can improved technology reduce the burden?** The majority of dealers in the Northeast Region currently provide data to NMFS under a voluntary reporting system. Under the voluntary program, NMFS provides dealers with NOAA Form 88-30 and obtains the information on that form monthly. The voluntary reporting program also accepts reports from dealers on their own forms, computer diskettes or via direct computer access. Such alternate reporting arrangements will continue to be acceptable for the mandatory reporting required by the amendment as long as all required information is provided. Every effort will be made in the future to use computer technology to reduce the public burden as the opportunity and technology allow.

**Describe any duplication of effort.** Many dealers already use NOAA Form 88-30 under the current voluntary data collection system and mandatory lobster reporting does not create a new burden on these dealers. However, voluntary reporting does not document the purchases of all dealers and is not acceptable for management of the fishery. While it provides good coverage of large ports in New England, it does not cover all of the smaller ports, particularly many of the small landing points in Maine and at present, does not include the States of Connecticut, Delaware, and North Carolina at all.

**Could existing information be modified to meet these needs?** Many of the dealers who will be required to report under this requirement currently collect the required information under the existing voluntary data collection system; for these dealers existing information is being used to meet the requirements of the amendment. The voluntary reporting program also accepts reports from dealers on their own forms, computer diskettes or via direct computer access. Such alternate reporting arrangements will continue to be acceptable for the mandatory reporting required by this amendment as long as all required information is provided. The information to be collected on the dealer report is already collected by dealers in the course of conducting business. It will be mandatory for lobster dealers to report all species purchased to obtain the data necessary for management.

**How are impacts on small businesses minimized?** Since almost all dealers who will respond are considered small businesses, separate requirements based on the size of business have not been developed. One of the most important features of the proposed collection is that it is comprehensive, and includes all participants in the fishery.

The format for Form 88-30 has been developed in cooperation with the respondents over the years of the voluntary program to ensure ease of use. The result is that many dealers use the forms to meet their own accounting requirements.

**Could the collection be conducted less frequently?** The frequency of reports has been kept to the minimum required for effective catch monitoring. Dealer reports must be submitted weekly to obtain meaningful and timely information on the status of the fishery. The weekly requirement is also consistent with the frequency of the dealer reporting requirements under the summer flounder and proposed lobster regulations. It is desirable to keep the frequency of these reports consistent to avoid confusion, especially in anticipation of mandatory dealer reports for other species such as groundfish.

**Explain if request is not consistent with 5 CFR 1320.6 guidelines.** The data collection is consistent with 5 CFR 1320.6 guidelines except that it requires information to be reported more frequently than quarterly. The need for this is described in Item 7.

**Describe efforts to get comments from outside the agency.** Public hearings were held on all of the proposed measures in the Amendment in the major lobster ports and lobster producing regions. Hearings were held in Ellsworth, ME, Rockland, ME, Portland, ME, Portsmouth NH, Peabody, MA, Buzzards Bay, MA, Galilee, RI, East Lyme, CT, Ronkonkoma, NY, and South Wall, NJ. Public agencies consulted included: NOAA/NMFS, USFWS, and fisheries agencies in all the Northeast coastal states from New Jersey through Maine.

**Describe any assurances of confidentiality.** All data will be kept confidential as required by NOAA Directive 88-30, Confidentiality of Fisheries Statistics, and will not be released for public use except in aggregate statistical form without identification as to its source. Confidentiality is also required by Section 303(d) of the MFCMA.

**Provide justification for any questions of a sensitive nature.** There are no questions of a sensitive nature.

**Provide estimates of annualized costs to the Federal Government and to the respondents.** Individuals involved in the preparation of the FMPs and knowledgeable about the industry estimate that there are no more than 500 lobster dealers. (In Maine there are 105 dealers who buy from five or more vessels). It is also estimated that 50 of these dealers currently submit these reports under the voluntary data collection system which has been conducted for several years. Therefore, the costs estimates provided in the table below only reflect the additional 450 dealers which it is estimated will obtain permits and file reports when the requirement becomes mandatory. These calculations assume a respondent wage and overhead value of \$15/hour. They also assume an average Federal cost of printing, distribution, and handling of \$25/respondent burden hour, based on data derived from 1981-87 logbook reporting to Northeast Region NMFS. The

Northeast Region will implement a fee system to allow recovery of a significant portion of these costs as allowed under MFCMA.

**Calculation of Public and Federal Estimate of Reporting Burden Hours and Costs (\$US)**

Number of Dealers	Number of Reports (weekly)	Total Number of Responses	Response Time (hr)	Total Hours	Cost to Public	Cost to Government
450	52	23,400	0.0335	784	11,760	19,600

**Provide estimates of the burden of the collection on the public.** As indicated in the table above, the new reporting burden associated with this collection is estimated at 784 hours. This burden assumes that it takes 2 minutes to complete the required weekly weigh-out form. This estimate may seem low unless one remembers that the information being provided is collected in the normal course of business and is in many instances collected on the required form. The reporting burden reflects only the collection of the additional information required to complete the dealer information on the form.

**Explain potential changes in burden.** The estimate of the number of new lobster dealers who will file these reports is estimated and changes are anticipated when actual figures become available.

**Describe plans for any statistical use of the information.** Results from this collection may be used in scientific, management, technical or general informational publications such as Fisheries of the United States and Fisheries Statistics of the United States, both of which follow prescribed statistical tabulations and summary table formats. Data are available to the general public on request in summary form only; data are available to NMFS employees in detailed form on a need-to-know basis only.

**c. Collection of Information Employing Statistical Methods.**

No statistical methods are employed in the information collection procedures.

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#### XIV. GLOSSARY

**ASMFC:** Atlantic States Marine Fisheries Commission - the interstate fishery management agency for the Atlantic coast.

**Biological Reference Points:** This term refers to a series of fishing mortality rates which have biological significance. The series includes:

**F<sub>0.1</sub>** A level of fishing mortality where the rate of increase in the catch in weight with increasing fishing mortality is 1/10 the rate of increase at extremely low mortality.

**F<sub>max</sub>** A level of fishing mortality where catch in weight is at its maximum value.

**F<sub>10%</sub>** The level of fishing mortality at which the number of eggs produced by the average recruiting female lobster throughout her lifetime is 10% of the number which would be produced if no fishing had ever occurred.

**Biomass:** Total weight of all individuals in a population of fish. The term may also apply to a particular portion of the population, such as all of the sexually mature individuals in the population.

**CPUE:** Catch Per Unit of Effort - catch in pounds (or kilograms) per trap, as used in Lobster Amendment #5, may be a crude measure of lobster abundance.

**EEZ:** Exclusive Economic Zone - all waters from the seaward boundary of state territorial waters to 200 miles offshore and which come under the jurisdiction of the Councils.

**EMT:** Effort Management Team - standing committees (one for each of the management areas) which will be established by Lobster Amendment #5 for the purpose of recommending management measures to be applied to each management area.

**F:** Fishing mortality rate. The proportion of the population which is caught by fishermen over any period of time, expressed as a logarithm. Fishing mortality may also be expressed as an annual percentage.

**FMP:** Fishery Management Plan - documents prepared by the Councils for managing fisheries in the EEZ.

**GBO:** Georges Bank and Offshore - one of the three lobster resource assessment areas which is south of the Gulf of Maine assessment area and offshore of the South Cape Cod to Long Island assessment area.

**GOM:** Gulf of Maine - one of three lobster resource assessment areas which includes the Gulf of Maine north of Lat 42°20', and including Cape Cod Bay.

**ITQ:** Individual Transferable Quota - a system of fisheries management that assigns property rights to fishermen in the form of a share of the Total Allowable Catch. Shares in the overall quota may be bought, sold, or leased.

**MFCMA:** Magnuson Fishery Conservation and Management Act - the act of Congress (passed in 1976) which created the regional Councils and is the Federal government's basis for management of fisheries in the EEZ.

**NEFSC:** Northeast Fisheries Science Center - the NMFS laboratory at Woods Hole, MA.

**NMFS:** National Marine Fisheries Service - the Federal fishery management agency.

**OMT:** Operational Management Team - a group established under Lobster Amendment #5 to continue work on the overfishing definition for lobster.

**Overfishing:** Harvesting at a rate which is greater than the long-term average rate of replacement of individuals in the population through reproductive activity.

**OY:** Optimum Yield - the harvest level of a species that provides the greatest overall benefit to the nation, taking into account all relevant biological, social, and economic considerations.

**Pre-recruit:** An individual lobster which will join the legal sized category (recruit) the next time it molts. Could also refer to any lobster in the entire size range of juvenile lobsters.

**Recruit:** An individual lobster which has just molted into the legal sized category.

**RD:** Regional Director - the senior NMFS official within a particular region. There are two regions on the Atlantic coast; the Northeast Region, headquartered in Gloucester, MA, and the Southeast Region, headquartered in St. Petersburg, FL.

**SARC:** Stock Assessment Review Committee - the group of fishery scientists (from NMFS, the Councils, the state management agencies, colleges & universities, etc.) which do the "number-crunching", and prepare the resource stock assessments which provide the basis for regional fishery management.

**SAW:** Stock Assessment Workshop - the plenary meetings where the resource stock assessments are presented to the users (NMFS, the Councils) and to the public.

**SCCLI:** South Cape Cod to Long Island - one of the three lobster resource assessment areas. The SCCLI area covers all waters north of 41° and west of 70°. It includes Long Island Sound, Block Island Sound, Rhode Island Sound, Buzzards Bay, and Nantucket Sound.

**TAC:** Total Allowable Catch - the total poundage of fish which may be made available to fishermen for harvest under a quota system of management.

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## APPENDIX B: Council Motion of January 13, 1993

The Council motion of January 13, 1993 formally accepted the industry management plan developed by the Lobster Industry Working Group as the basis for Amendment #5 to the American Lobster FMP. The following is the text of the motion:

*That there will be a two part Joint Plan of ASMFC and NEFMC; Part I will consider the twelve items of the industry plan to be developed for submission of the plan by December 1993.*

1. *There will be no harvesting of "egggers"*
2. *There will be no "scrubbing" of egg bearing lobsters*
3. *The minimum gauge size will be  $3\frac{1}{4}$  inches*
4. *There will be v-notch protection and no landing of lobsters with tails mutilated in such a way as to obliterate a notch at least in all Federal waters*
5. *There will be no landing of lobster parts*
6. *There will be a uniform minimum vent size*
7. *All traps will have "bio-panels" (biodegradable parts to permit escapement if trap is lost)*
8. *There will be "dumping" regulations to enhance enforcement*
9. *There will be mandatory reporting of appropriate records (catch reports, effort levels, etc.) by fishermen and dealers similar to Massachusetts or Connecticut format*
10. *There will be a moratorium on permits for participation in the Federal lobster fishery which will extend from the Control Date of March 25, 1991, until 2 years following the implementation of this plan*
11. *A limited entry system, in some form, will replace the moratorium when it expires*
12. *No lobsters may be landed that have been harvested using the otter and beam trawl (dragging) method of fishing or other mobile gear*

*Part II will be to develop an effort reduction plan by October 1994 which will produce a reduction in F by January 1, 2000 that yields a biomass per recruit increase equivalent to that which would have resulted from the carapace length increase from  $3\frac{1}{4}$  inches to  $3\frac{5}{16}$  inches.*

*Industry, both potters and mobile gear vessels, will be encouraged to meet to develop a compromise on the issue of possession of lobsters on trawlers. If it appears that items 11 and 12 of the Industry List of management measures, that is the development of a limited entry system and the lobster on trawlers issue - if those two items are going to result in a delay in the submission date of December 1993, consideration of these items will be deferred for further consideration during the development of Part II.*

To a certain extent, the Council motion of January 13, 1993 was overtaken by events. In subsequent revisions to the industry recommendations, item #11 was redefined as the suite of qualifying criteria for issuance of new Operator's Permits (called a license in the industry draft), item #12 was substantially softened to allow documented catches by draggers, and a Stock Rebuilding Program was proposed to address overfishing. The provisions of the motion under Part II (the notion that an effort reduction program be established to address the "equivalency" issue) became moot with the finding that the resource is overfished and that significantly deeper reductions in fishing mortality would be required. However, the Council motion of January 13, 1993 is an important facet of the administrative record and, as such, is included in this Appendix.

**APPENDIX C: Copies of CZM Letters**