REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN FOR AMERICAN LOBSTER (*Homarus americanus*)

2004 FISHING YEAR

Prepared by the Plan Review Team

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I. Status of the Fishery Management Plan

Year of Plan's Adoption:	1997
Framework Adjustments:	Addendum I (1999) Addendum II (2001) Addendum III (2002) Addendum IV (2003) Addendum V (2004) Addendum VI (2005)
Management Unit:	Maine through North Carolina
States with a Declared Interest:	Maine through North Carolina (Excluding Pennsylvania)
Active Committees:	American Lobster Management Board, Technical Committee, Stock Assessment Sub-Committee, Socio-Economic Sub-Committee, Model Development Sub-Committee, Advisory Panel, Plan Development Team, Plan Review Team, Transferability Subcommittee

II. Status of the Stocks

A Stock Assessment and Peer Review for American Lobster was completed in August of 2005. The status of these two reports will be made public at the November meeting of the American Lobster Board. The status of the stock and assessment advice section of this document will be updated accordingly after the stock assessment and peer review reports have been made public.

III. Status of the Fishery

Harvests of American lobster peaked in 1999 at 40,442 metric tons. The significance of this increase in harvest is most easily illustrated by comparing 1999 landings to that of the period between 1978-1987 (15-20,000 mt). Landings have continued to increase over time, with small decreases occurring in 1992, 1998, 2000, and 2003. Maine and Massachusetts account for 90% of the 2003 commercial landings, 75% and 15% respectively. The magnitude of recreational landings is unknown. In contrast to the 1990s, when all stock areas experienced increases in landings, the status of the fishery now varies dramatically by area.

During the fall and winter of 1999-2000, the lobster resource in western Long Island Sound suffered mass mortalities, the cause of which is still under investigation. Following requests from the Governors of NY and CT, the U.S. Secretary of Commerce, on January 26, 2000, declared the Long Island Sound (LIS)die-off to be a commercial fishery failure. Following the declaration, the U.S. Congress appropriated $13.9

million to address the biological and economic consequences of the fishery failure. The 13.9 million dollars were distributed with $7.3 million to provide economic relief funds for impacted NY and CT lobstermen, and $6.6 million to research funds for a comprehensive research into the possible cause(s) of poor lobster health in LIS.

In August of 2002, the Lobster Management Board asked the Technical Committee to advise the Board on the magnitude of problems in Area 2 as well as recommend an appropriate response. This request was in response to requests form Area 2 fishermen to look into the dramatic declines of the recourse in Area 2. The October 2002 Technical Committee report indicated that landings had declined, the area survey indices had declined, and the incidence of shell disease was increasing. There was a consensus among the TC that the current overfishing definition (F10%), in combination with the proposed management measures, were not sufficient to remedy the current stock declines observed in Area 2 and spawning stock biomass needed to be rebuilt. The Lobster TC recommended reducing fishing mortality in Area 2, reducing effort in Area 2, and continuing to work on a control rule that incorporates both f-based and biomass based reference points to offer better management advice to varying stock conditions.

Table 1. Total commercial landings in metric tons. (Based on NMFS landings data as of 10/1/2005)

Year	Metric tons	Pounds	$
1990	28,297	62,383,125	154,757,113
1991	29,073	64,093,998	166,014,347
1992	25,978	57,270,826	166,371,185
1993	26,290	57,958,940	160,260,573
1994	31,720	69,930,711	207,161,675
1995	31,742	69,978,238	214,465,158
1996	32,346	71,310,316	241,785,034
1997	37,455	82,572,804	271,573,416
1998	36,330	80,092,672	255,103,096
1999	40,442	89,158,577	329,500,980
2000	39,429	86,926,003	314,255,145
2001	32,293	71,192,803	249,509,514
2002	37,094	81,776,532	290,329,744
2003	32,515	71,682,906	283,515,593

Table 2. Landings of American Lobster by the states of Maine through New Jersey from 1990-2003 (pounds). (Source, NMFS Commercial Fisheries Statistics Web Page as of 10/1/05 for 1990 – 2003 and ASMFC Lobster Database for some 2003 values)

Year	Maine	Massachusetts	Rhode Island	New York	Connecticut	New Hampshire	New Jersey
1990	28,068,238	17,054,434	7,258,175	3,431,111	2,645,800	1,658,200	2,198,867
1991	30,788,646	16,528,168	7,445,172	3,128,246	2,674,000	1,802,035	1,673,031
1992	26,830,448	15,823,077	6,763,087	2,651,067	2,439,600	1,529,292	1,213,255
1993	29,926,464	14,336,032	6,228,470	2,667,107	2,177,022	1,693,347	906,498
1994	38,948,867	16,100,264	6,474,399	3,954,634	2,212,000	1,650,751	581,396
1995	37,208,324	15,771,981	5,363,810	6,653,781	2,536,177	1,834,794	606,016
1996	36,083,443	15,330,377	5,296,110	9,408,689	2,888,683	1,632,829	640,207
1997	47,023,271	15,092,014	5,801,183	8,878,395	3,468,051	1,414,368	858,426
1998	47,036,836	13,278,726	5,618,440	8,525,590	3,715,316	1,194,653	721,811
1999	53,494,418	15,533,953	6,410,125	7,062,687	2,595,764	1,380,714	935,837
2000	57,215,406	15,802,888	6,921,573	2,991,331	1,393,565	1,709,746	891,183
2001	48,617,693	12,132,807	4,809,158	2,052,741	1,329,707	2,027,725	579,753
2002	62,315,131	12,853,380	3,835,050	1,440,483	1,067,121	2,029,887	264,425
2003	54,970,948	11,385,049	3,474,508	946,449	671,119	1,960,245	209,956

IV. Status of Assessment Advice

A Stock Assessment and Peer Review for American Lobster was completed in August of 2005. The status of these two reports will be made public at the November meeting of the American Lobster Board. The status of the stock and assessment advice section of this document will be updated accordingly after the stock assessment and peer review reports have been made public.

V. Status of Research and Monitoring

Prioritized Research Needs 2005

These priorities are subject to complete revision subject to he release of the stock assessment.

HIGH PRIORITY

- Initiate studies of life history events (molting, extrusion, mortality, etc.) in older/larger lobsters on a regular basis.
- Monitor the condition of the stocks and determine the effects of management measures and environmental changes on the abundance of the stocks and on the fisheries. (Currently monitored in part by annual survey trend reports by the Technical Committee.)
- Quantify changes in the spatial distribution of effort.
- Enhanced sea sampling and/or port sampling of offshore catches is urgently needed for biological characteristics of catches and landings since current sampling in these areas is considered inadequate for assessment purposes
- Methods should be developed to derive standardized catch-per-unit-effort indices which include trap attributes, season, soak time, etc. Sea sampling should be modified to include collection of potentially important variables.
- Estimates of biological reference points for the Gulf of Maine stock are partly influenced by the assumed level of v-notching undertaken by area fishermen. No adequate estimate of the proportion of compliance with this mandatory measure now exists. A credible study of this issue is recommended to reduce uncertainty in estimation of biological reference points. (A v-notching model used by the TC does a credible investigation of observed percentages and V-notching rate)
- Analyze effects of different spatial combinations of survey stations in the Delury model.

MEDIUM PRIORITY

- Develop a monitoring plan to detect recruitment trends(Sea sampling, trawl survey, Settlement surveys are conducted in ME, NH, MA and RI.)
- The inclusion of multiple survey indices in DeLury population models could potentially be useful in refining estimates of stock size and F, and should be explored. (A preliminary version of the DeLury model with multiple indices has been developed, but was not available for SAW-22).
- Predictions of EPR models should be validated with respect to data from fishery-dependent and fishery-independent sources including: length frequency distribution of catch, projected growth trajectory, and size-specific sex ratios, fraction egg bearing, fraction soft shell, and fraction V-notched.
- Explore alternatives to timing of events in the EPR model. Investigate geographic and seasonal patterns of growth, reproductive events, and fishing intensity from catch and sea sampling data. Standardize methods of sampling and statistical analysis are needed to determine these patterns.
- Additional analyses of biological attributes of the catch and survey data are needed to corroborate patterns and trends in F estimates.
- Examine temperature effects on growth, reproduction, etc. (Many lab studies have been done, but have not been related to the EPR model in the form of an environmental component.)
- Conduct spatial mapping of survey indices and projected egg production.
- More precise and accurate DeLury model estimates of stock size and fishing mortality rates can be made if the relative selectivity of pre-recruit and fully recruited sizes to the bottom trawl survey gear is resolved. Appropriate field studies of lobster availability and R/V gear selectivity are considered a priority.
- Develop standardized LPUE-index fishers.
- Investigate the effects of spatial distribution/movements/selectivity in the Delury model.
- Examine trap effects on catch.
- Undertake regional examination of temperature-yield relationship. (Estrella, Bruce, and Steven Cadrin. 1991. Massachusetts coastal commercial lobster trap sampling program, 1990 Annual Report. 52 pp.; Fogarty, Michael J. 1988. Time series models of Maine lobster fishery: Effects of temperature. Canadian Journal of Fisheries and Aquatic Sciences, Volume 45, 1145-1153.)
- Examine temperature, effort, and abundance effects on catch.
- Use comparative evaluations of reproductive rates with respect to temperature.
- Terminology for lobster life stages need to be defined and standardized for each state's sampling programs in order to ensure comparability and synthesis of available data. (The TC now uses similar size classes for all comparisons)
- Examine fixed and random sampling.
- Include multiple input series in modeling for lobster.
- Compare fishery-dependent and fishery-independent length frequencies. (Completed through stock assessment process but no formal document. (in press. Schierer, Wilson and Chen. Comparison of port and sea sampling)
- Develop a time series of standardized fishing effort and compare with F.

LOW PRIORITY

- Compile existing tagging data-transfer rates.
- Compile existing larval data - transfer rates.
- Examine spatial differences in F (10%) in the egg production per recruit model.
- Evaluate potential biases in the Delury analysis due to incomplete coverage in different substrates.
- Assess the utility of satellite DNA and apply throughout range, if promising. Genetic identity of LIS

population should be examined. (Dr. Irv Kornfield, University of Maine, paper in press/process for LIS data; papers on utility of satellite DNA should be out. See Note in Reference Section.)

- Conduct cooperative studies with fishers on gear efficiency.
- Obtain information on operational and socioeconomic data for the commercial fisheries.
- Undertake sensitivity analyses in the DeLury model.
- Develop models with enhanced size/stage structure.
- Test the thermal limit hypothesis. (Annis, PHD candidate Univ. of Maine, looking at larval diving in response to temperature)
- Examine effects of predation, regime shifts, etc. (Wendy Norton, MS student UCONN, looking at predation on post larvae)
- Establish field studies of density-dependent processes. (Bob Steneck in progress.)
- Combined analyses of inshore and offshore southern stocks produced intermediate results, and were sensitive to the research vessel series (Rhode Island inshore or NEFSC offshore) used for DeLury modeling. Quantitative methods for combining stock status and reference points to multiple stock areas are necessary for providing region-wide assessment advice for the American lobster resource through its range.
- Investigate spatial differences in demography of American lobster**.**

VI. Status of Management Measures and Issues

Amendment 3 established management measures that require coastwide and area specific measures applicable to commercial fishing. The coastwide requirements are summarized in Table 3.

Table 3. Coastwide requirements and prohibited actions

- Prohibition on possession of berried or scrubbed lobsters
- Prohibition on possession of lobster meats, detached tails, claws, or other parts of lobsters by fishermen
- Prohibition on spearing lobsters
- Prohibition on possession of v-notched female lobsters
- Requirement for biodegradable “ghost” panel for traps
- Minimum gauge size of 3-1/4”
- Limits on landings by fishermen using gear or methods other than traps to 100 lobsters per day or 500 lobsters per trip for trips 5 days or longer
- Requirements for permits and licensing
- All lobster traps must contain at least one escape vent with a minimum size of 1-15/16” by 5-3/4”
- Maximum trap size of 22,950 cubic inches in all areas except area 3, where traps may not exceed a volume of 30,100 cubic inches.

Amendment 3 also established seven Lobster Conservation Management Teams (LCMTs), each of which coincides with a management area. The Commission has approved three addenda for the purposes of incorporating LCMT recommendations for full implementation of Amendment 3. Addendum I incorporated measures from the LCMT proposals, which were intended to control effort. Addenda II-V were designed to address management measures affecting egg production. The measures included in Addenda I-VI supercede measures addressing similar issues under Amendment 3 and are summarized in Tables 4 below.

Table 4: Area specific management measures

Management Measure	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	OCC
Trap Limits/Numbers	Trap Cap (800)	**Trap Cap(800)	Hist. Part.	Hist. Part.	Hist. Part.	Hist. Part.	Hist Part. (25% Reduction by 2008)
Gauge Size (2001)	3-1/4"	3-9/32"	3-9/32"	3-1/4"	3-1/4"	3-1/4"	3-9/32"
Gauge Size (2002)	3-1/4"	3-5/16"	3-5/16"	3-5/16"	3-5/16"	3-1/4"	3-5/16"
Gauge Size (2003)	3-1/4"	3-11/32" 3-3/8"	3-11/32"	3-11/32"	3-11/32"	3-1/4"	3-11/32"
Gauge Size (2004)	3-1/4"	3-3/8"	3-3/8"	3-3/8"	3-3/8"		3-3/8"
Gauge Size (2005)	3-1/4"	3-13/32"	*3-13/32"			*3-9/32"(1)	*3-13/32"
Gauge Size (2006)	3-1/4"	3-7/16"	*3-7/16"			*3-5/16"(1)	*3-7/16"
Gauge Size (2007)	3-1/4"	3-15/32"	*3-15/32"				*3-15/32"
Gauge Size (2008)	3-1/4"	3-1/2"	*3-1/2"				*3-1/2"
Escape Vent Size @ 3-3/8"	*2 X 5-3/4" (2007)	2 X 5-3/4" (2003)	2 X 5-3/4" (2003)	2 X 5-3/4" (2003)	2 X 5-3/4" (2003)	*2x5-3/4" (2006)	2 X 5-3/4" (2003)
+Escape Vent Size @ 3-1/2"		*2-1/16 X 5-3/4" (2008)	*2-1/16 X 5-3/4" (2008)				*2-1/16 X 5-3/4" (2008)
V-notch Definition	Zero Tolerance	¼" v-notch No Setal Hair	¼" v-notch No Setal Hair	¼" v-notch No Setal Hair	¼" v-notch No Setal Hair	¼" v-notch No Setal Hair	¼" v-notch No Setal Hair
Mandatory V-Notching	Mandatory		Mandatory Above 42° 30'				
Maximum Size	5"			5-1/4" (2)	5-1/2" (2)		

NOTES * - If necessary provisions. At the December 2003 Board meeting, the Board indicated if necessary are necessary unless the Board indicates they are not at a later date EXCEPT Area 6 has a one-year delay.
** Area 2 will be implementing a limited entry trap transferability program in 2005 – see Addendum VII.
+ Escape Vents increase with gauge sizes in this Area. Please see Addendum III and IV for details.
(1) – At the December 2003 Board meeting, the Area 6 gauge increases were delayed by one year from 2004 & 2005 to 2005 & 2006.
(2) – The maximum size applies only to female lobsters in Management Areas 4 and 5.

Management measures are effective July 1st of the identified implementation year.

Issues:

- There is ongoing concern about the health of the lobster resource in Area 6 and Area 2.
- The Board is exploring methods to better to track effort in the lobster fishery. Some of these methods will be implemented in 2005.
- Due to the delay in federal implementation of several area specific management measures, there is a difference in management measures between the state and federal government that is impeding uniform enforcement across the region. Currently there is a proposed rule published in the federal register. The proposed modifications would provide increased protection to egg bearing female lobsters and broodstock lobsters in certain Lobster Conservation Management Areas (LCMAs) and complement existing state regulations currently in effect. In addition, there are four measures in this proposed rule that would further clarify existing Federal lobster regulations

VII. Current State-by-State Implementation per Compliance Requirements (As of November 2004)

All states are currently in compliance with all required measures under Amendment #3, Addendum I-VI.

VIII. Recommendations and Issues

The following are issues the Plan Review Team would like to raise to the Board as well as general recommendations:

1. With the impending release of the new stock assessment and the possibility of new reference points, there may be a need for changes to the management program for American Lobster. The PRT recommends the ASMFC conduct a socioeconomic subcommittee evaluate the impacts of the stock assessment results and recommendations on what emphis should be placed direction of assessment.. assessment of the lobster fishery to serve as baseline information for these management discussions.
2. The PRT believes the ability to judge the success or failure of management measures on management area vs. stock unit basis is critical and recommends that the TC explore this further.
3. The PRT is concerned about the ability of the lobster management program to respond to changing stock conditions and believe this issue should be explore the potential use of biological triggers that could initiate action through the use of control rules. Continue to work on biomass fishing mortality threshold an dtargest atha twould initiate mangment action if met.
4. The information collected under the ACCSP program will play an integral role in area management and the PRT encourages the full implementation of data collection programs to enhance the ACCSP data collection. The PRT recommends that states implement logbook programs to collect the necessary data.