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UNITED STATES
DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
MANAGEMENT DIVISION
STATE-FEDERAL RELATIONS BRANCH

COMPLETION REPORT

State: Massachusetts

Project Number: 3-ACA-005

Grant Number: NA56FG0254

Project Title: Interstate Fisheries Management Support Program

Period Covered: May 01, 1995 -- September 30, 1996

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Statutory Funding Authority: Atlantic Coastal Act (P.L. 103-206)

STATEMENT OF WORK

The Massachusetts Division of Marine Fisheries participates in ACFCMA by continuing to enhance it's staff capabilities in the areas of Information Systems, Fisheries Economics and Population Dynamics. Specifically, these enhanced capabilities will allow the Division to develop and conduct more efficient quota monitoring systems, evaluate economic and population dynamics data as it relates to fisheries management plans, including plans developed by both the Atlantic States Marine Fisheries Commission and the Regional Fisheries Management Councils; assist DMF research and management projects with data entry and information systems development. ACFCMA also funds certain activities of the Division's Conservation Engineering Project, which, through fishing method and gear changes, seeks to reduce by-catch and by-catch mortality on species which are under ASMFC management.

The Project's Fisheries Economist officially began his duties under ACFCMA funding on September 10, 1995. The Economist's former position with the Division of Marine Fisheries remained vacant until January 02, 1996 and much of the incumbent's time was spent maintaining prior responsibilities. A Fisheries Statistician was hired at the first of the year under the IJ funded Statistics Project. The Economist spent some of his time during the fiscal year of this report training the Fisheries Statistician and ensuring that publication and statistics production deadlines for the Statistics Project were met. The temporary Data Entry services for this grant were contracted and the Clerk also started on January 02, 1996. The position of Population Dynamics Specialist was hired on February 19, 1996.

During 1995, The National Marine Fisheries Service, the three Atlantic Coast Regional Fisheries Management Councils, The U. S. Fish and Wildlife Service, the Atlantic States Marine Fisheries

Commission and all of the States along the Atlantic Coast formed the Atlantic Coastal Cooperative Statistics Program. Implementation and operational plans are now being developed for the deployment of the program on January 1, 1998. Funding under this grant has allowed DMF to continue to participate fully in this activity.

Job 1. Quota Monitoring:

The Fisheries Economist has the primary responsibility for quota monitoring and notification of fishermen and dealers as to the quota status and monitoring requirements. Increased notification of quota status has been requested by both the industry and cooperating fisheries and enforcement agencies. As quota managed fisheries become more numerous, the Economist will be responsible for maintaining existing systems and planning new systems using state-of-the-art technology. Quota managed fisheries currently include fluke, striped bass and bluefish. Plans are under development that may require the imposition of landings quotas for squid, scup, sea bass and tautog.

The Fisheries Economist and Statistics Project Leader were invited to participate on a NMFS committee to investigate the application of technology solutions to real-time quota monitoring. The 'TAC Monitoring Group' was convened by the Regional Director at the will of the New England Fisheries Management Council who were considering the use of Total Allowable Catch (TAC) for Amendment #7 to the Multispecies FMP. The Economist was able to offer his experience with Interactive Voice Response (IVR) technology and a long association with the Federal data management process. The committee met frequently during the month of September to discuss the costs and feasibility of different technologies for monitoring catch in near real time. The Economist wrote two drafts of a working paper on the application of an IVR solution to the TAC monitoring issue. These drafts were incorporated into an extensive final report of the Committees findings. The final report was reviewed by all members of the Committee and was submitted to the Regional Director for his consideration.

Quota monitoring activity in the third and fourth quarters of 1995 were minimal. Fluke and striped bass fisheries were closed in September in Massachusetts. Dealer paperwork for these species were due by the end of November. A list of dealers who had not yet

complied with the end-of-year reporting requirement was compiled and submitted to the licensing staff. These license renewals were pulled and held pending submission of the required reports. Final landings for 1995 are as follows:

Bluefish	581,374 pounds	(750,000 quota)
Summer Flounder	1,095,187 pounds	(1,122,246 quota)
Striped Bass	772,559 pounds	(750,000 quota)

A brief winter commercial fishery for summer flounder was opened on February 01, 1996. The Commonwealth's share of the 1996 commercial fluke quota was 757,600 pounds. The quota is split with 30% (227,280 pounds) for the period January 1 through May 31 (winter/spring) and 70% (530,320 pounds) for the period June 1 through December 31 (summer/fall). The winter fishery was open for seven days only and 206,000 pounds were landed by 98 trips. The fluke fishery reopened on March 25, 1996 with a trip limit of 100 pounds. The summer trip limit was increased to 300 pounds on June 17, 1996. The annual quota was determined to be reached on August 10, 1996 and the fishery was closed for the remainder of the year. The spring/summer fishery landed 580,000 pounds from 3,565 trips.

The 1996 commercial striped bass fishery was opened on July 01, 1996. The total quota available for the fishery was 718,000 pounds. A schedule of three weeks on and one week off was devised in an attempt to spread the season out as long as possible. Availability of bass to commercial anglers was tremendous and in spite of the blocks of time off, the quota was caught by August 10, 1996. The fishery was closed just short of the quota being taken. The 1996 commercial bluefish fishery was uneventful as ever. Final paperwork for these fisheries was being compiled at the end of this grant. Preliminary final numbers for 1996 are as follows:

Bluefish	445,909 pounds	(750,000 quota)
Summer Flounder	785,611 pounds	(752,000 quota)
Striped Bass	696,815 pounds	(718,000 quota)

Several improvements were made to the Dial-A-Fish quota monitoring system. In addition to routine seasonal message changes and data backup, some major programming changes were made. A voice data management software called MasterVox Studio was purchased and installed to better handle recording and editing voice prompts on the IVR system. An upgrade version of the primary IVR software was installed and the quota monitoring application was modified extensively to conform to the upgrade. The Economist worked

closely with the contractor installing the new phone system at Cat Cove Marine Lab to connect the IVR system to the new digital phone system. (see Job 6.)

Job 2: Economic Analysis of Fishery Management Plans

The Fisheries Economist is responsible for the review and development of economic analyses relative to existing and proposed fisheries management plans. During the third quarter of 1996, the incumbent began the design of a large database and data analysis structure for the Northern Shrimp Technical Committee of which he is a member. The shrimp database collected historical data from 1980 to 1996 for all commercial shrimp trips sampled in Maine, New Hampshire and Massachusetts. The database will provide a framework for analyzing these data and moving them more efficiently into the stock assessment process. The Project's Data Entry Temp has assisted greatly in the entry and QA/QC of these data. The new database/analysis system will be introduced and put to use in the in the October stock assessment process for Northern Shrimp in Woods Hole, MA and the Shrimp Section public hearing in Portsmouth, NH. In addition to the stock assessment activities, the Economist attended two shrimp industry advisors meetings in Portland, ME and Boothbay Harbor, ME and participated in the summer shrimp assessment cruise.

The Economist is a member of the ASMFC's Economics and Social Sciences Board. The inaugural meeting for this group was held at the ASMFC annual meeting in Charleston, SC in November of 1995. The Committee will be instrumental in developing the Social and Economic components of the Atlantic Coast Cooperative Statistics Program. The incumbent worked closely with economists at Woods Hole to prepare documentation that would direct the work of the Committee. The full Committee met in September in Philadelphia, PA to begin the task of developing the ACCSP.

The Economist provided support and analysis for a number of other projects at the regional and Federal level. A brief analysis was prepared with an ASMFC staff member to supplement a comprehensive report on the Commission's involvement in the use of binary coded wire tagging as a tool for striped bass assessment and enhancement. A large database of information was assembled to assist the NMFS with qualifying fishermen for lobster fishing in the EEZ. The database drew upon the Division's long history of collecting annual catch data from licensed commercial lobstermen in the Commonwealth. The Economist participated in a day-long meeting with NMFS

economists working to improve data collection and analysis in the charter-party industry. A tremendous amount of database analysis was conducted to assist state and NMFS managers in their efforts to comply with the Endangered Species Act for Northern Right Whales.

At the state level, the economist has been involved in a number of economic and data management projects. The Legislature included language for funding of an electronic fish auction system in the Commonwealth in a Bond Bill signed by the Governor in 1996. The Project Economist has been named the lead in the process of identifying, developing and implementing a state of the art system to electronically link fresh fish display auctions in our major ports and to deliver information to the marketplace like never before. An extensive database application was written for the Massachusetts Office of Business Development to generate lists of Massachusetts seafood dealers for interested patrons at the Boston International Seafood Show. The Project Leader and his staff were requested to design and analyze the Information Technology needs of the entire agency to aid in fiscal planning. A large survey instrument was created, distributed and the data were collected and analyzed in a large relational database application.

Job 3: Population Dynamics Analysis of Fishery Management Plans

The Project's Aquatic Biologist III (Population Dynamics Specialist) allows the Division to create and evaluate complex population models for state, ASMFC and Council fishery management plans. The specialist will review, critique, develop and improve fishery population data and other parameters associated with fishery management plans. He will participate as the state representative on Technical Committees established by the Atlantic States Marine Fisheries Commission and the Councils. The incumbent will work with the Division's Resource Assessment personnel to provide expertise, guidance and coordination of Division assessments with regard to state, regional and national fisheries assessment and management regimes.

ATLANTIC MENHADEN

As the state representative on the Atlantic Menhaden Advisory Committee, I attended the AMAC meeting April 10-11 to review the 1995 stock assessment, Internal Waters Processing allocation, and bait fishery sampling. At the request of the AMAC an investigation

was conducted on estimation error of the annual stock assessment, and a manuscript was completed:

> Cadrin, S.X. and D.S. Vaughan. (in review). Retrospective consistency of virtual population analysis estimates for the Atlantic menhaden stock assessment. Fishery Bulletin.

- Drafted memo to DMF administration on 1996 AMAC meeting.

- Compiled Mass. bait landings 1985-95 for AMAC.

- Port Sampled the Mt. Hope Bay pogy fishery and processed samples.

- Drafted a memo which summarized the conflict between RI sport fishermen and pogy seiners as well as research related to the conflict for the Congressional Research Service.

- Completed final reviewers' comments on publication:

> Cadrin, S.X. and D.S. Vaughan. 1997. Retrospective Analysis of Virtual Population Estimates for Atlantic Menhaden Stock Assessment. Fishery Bulletin. 95: 445-455.

ATLANTIC HERRING

As the state representative to the Atlantic Herring Technical Advisory Committee and a member of the 21st Stock Assessment Review Committee, I attended a TAC meeting on March 4 to discuss the SARC 21 stock assessment and management advice, recommend Internal Waters Processing allocations, discuss revision to the Fishery Management Plan, and plan future research.

A proposal from Maine Department of Marine Resources to estimate available biomass for individual spawning groups was critically reviewed.

AMERICAN LOBSTER

As a member of the Stock Assessment Workshop Invertebrate Subcommittee, a meeting was attended to prepare for the Lobster Review Panel. A presentation was prepared and defended at the Lobster Review Panel:

Murawski, S. and S. Cadrin. 1996. Assessment methodology and status of the stock. Review of the Population Dynamics of American Lobster in the Northeastern United States, Warwick, RI, March 25-29.

Assistance was also provided to the Coastal Lobster Investigations Project for other presentations to the Lobster Review Panel.

Posters were produced, presented, and discussed at two regional conferences:

Cadrin, S.X. 1996. Discrimination of American lobster stocks off southern New England based on secondary sex character allometry. 52nd Annual Northeast Fish and Wildlife Conference, March 31-April 3. p. 116.

Cadrin, S.X. 1996. Morphometric discrimination of lobster stocks. Coastal Capsules, a Poster Session of Coastal Research, Woods Hole Oceanographic Institution, March 25-29.

Reprints of the following paper were disseminated to members of the Lobster TC:

- Cadrin, S.X. 1995. Discrimination of American lobster stocks off southern New England based on secondary sex character allometry. Canadian Journal of Fisheries and Aquatic Science 52(12):27:2712-2723.

- Developed a spreadsheet application to perform length-based cohort analysis.

- Attended a joint meeting of the TC and the Invertebrate subcommittee of the 22nd Stock Assessment Workshop (5/13-5/17). Presented a working paper entitled, "Preliminary length-based cohort analyses of female American lobster from inshore Gulf of Maine". Resolved problems with NMFS canvass database, compiled Gulf of Maine landings, completed 1981-94 DeLury analyses and length-cohort analyses of Gulf of Maine males and females.

- Completed length cohort analyses of southern New England and Georges Bank offshore stocks.

- Attended the 22nd Stock Assessment Review Committee meeting (6/7-6/22). Served as rapporteur for the lobster assessment, and presented a working paper entitled, "Length-Cohort Analyses of U.S.

American Lobster Stocks.

- Attended New England Fishery Management Council meeting (8/14) for presentation of lobster assessment.

- Submitted working paper with B. Estrella to the Northeast Fisheries Science Center for publication as a Center Reference Document and completed reviewers' revisions:

> Cadrin, S.X. and B.T. Estrella. 1996. Length-cohort analyses of U.S. American lobster stocks. NEFSC Ref. Doc. 96-15.

WINTER FLOUNDER

As a member of the Southern Demersal Subcommittee of the Northeast Regional Stock Assessment Workshop, two technical reports were completed:

> Cadrin, S. A. Howe, S. Correia, G. Shepherd, M. Lambert, W. Gabriel, and D. Grout. 1996. An index-based assessment of winter flounder populations in the Gulf of Maine. Northeast Fisheries Science Center Reference Document 96-05a.

> Shepherd, G., S. Cadrin, S. Correia, W. Gabriel, M. Gibson, A. Howe, P. Howell, D. Grout, N. Lazar, M. Lambert, and W. Ling. 1996. An index-based assessment of winter flounder populations in the Gulf of Maine. Northeast Fisheries Science Center Reference Document 96-05b.

The stock assessment presentation to the New England Fishery Management Council on February 27, was attended to clarify technical issues to the Director and other Council members.

- 1 day tagging winter flounder with Power Plant Project

- 1 day on winter flounder haul seine survey.

- Completed a technical review of a report by M. Gibson entitled, "Comparison of Trends in the Finfish Assemblage of Mt. Hope Bay and Narragansett Bay in Relation to Operations at the New England Power Brayton Point Station" for the DMF administration.

NORTHEAST GROUNDFISH

As a member of the Northern Demersal Subcommittee of the Northeast Regional Stock Assessment Workshop, two technical reports and one presentation were produced:

> Cadrin, S. and R.K. Mayo. 1996. Predicting spawning stock biomass for Georges Bank and Gulf of Maine cod stocks with research vessel survey data. Northeast Fisheries Science Center Reference Document 96-05c.
>
> Sosebee, K. and S. Cadrin. (in prep.). Abundance and biomass indices for northeast demersal complex stocks from NMFS and Massachusetts inshore bottom trawl surveys. National Marine Fisheries Service Technical Memorandum.
>
> Wigley, S.E. and S.X. Cadrin. 1996. The use of the Lorenz curve method to identify changes in concentrations of Georges Bank haddock. Sixth Science Symposium of the Northeast Fisheries Science Center.

A session on the Northeast Groundfish Problem was attended at the 52nd Northeast Fish and Wildlife Conference on April 1.

- Updated Mass. trawl survey indices for northeast groundfish stocks with 1995 data for a NOAA Technical Memorandum co-authored with K. Sosebee, NMFS. Performed trend analysis for abundance and biomass over time.

- 3 days Mass. spring bottom trawl survey.

- Attended Northeast Fisheries Science Center Symposium (5/7-5/9), and co-authored paper entitled, "The Use of the Lorenz Curve Method to Identify Changes in Concentrations of Georges Bank Haddock", with S. Wigley, NMFS.

- 3 days on Mass. fall bottom trawl survey.

SAW SOUTHERN DEMERSAL COMMITTEE

- Attended the SDC meeting (5/20-5/23) for the fluke assessment. Performed correlation analysis of research vessel abundance at age indices, assisted in retrospective analysis, and drafted text for the SDC report.

- Attended the 22nd Stock Assessment Review Committee meeting (6/7-6/22).

- Attended June Mass. Marine Fisheries Commission meeting to summarize fluke assessment information.

- Attended New England Fishery Management Council meeting (8/14) for presentation of fluke assessment.

NORTHERN SHRIMP TECHNICAL COMMITTEE

- Canvassed DMF staff for 1996 shrimp cruise volunteers and arranged logistics.

- Attended NSTC meeting on 7/6.

- Compiled NSTC research needs for ASMFC.

MISCELLANEOUS TASKS

A manuscript on analysis of northeast sea sampling data was critically reviewed for the North American Journal of Fishery Management. Statistical analysis of bluefin tuna prey data were performed at the request of Division staff. Technical review of the annual report of the Resource Assessment Project was completed.

- Reviewed a manuscript for Fishery Bulletin on estimating bycatch rates from sea sampling data.

- Reviewed a manuscript by B. Chase entitled, "The Diet of Bluefin Tuna off the Coast of Massachusetts".

- Installed a new version of Vines to all network PCS in the Sandwich office and resolved several minor network problems.

Job 4: Atlantic Coastal Cooperative Statistics Program Planning.

In October of 1995, the National Marine Fisheries Service, the US Fish and Wildlife Service, the three Atlantic Coast Fishery Management Councils, the Atlantic States Marine Fisheries Commission and all of the Atlantic Coastal States, formed the Atlantic Coastal Cooperative Statistics Program (ACCSP). Policy and oversight for this program will be undertaken by the Agency directors of each of the entities listed above forming as a Council. Implementation and operation of the Program will be conducted by a smaller group of middle-level managers representing the larger council; The Operations Committee. The MIS/Statistics Project Leader has been deeply involved in the strategic planning process of the cooperative program and is the New England States representative to the Operations Committee. The planning process has moved beyond the strategic level to implementation and operational planning. The Fisheries Economist provides staff support in this process.

The Economist is a member of the ASMFC's Economics and Social Sciences Board. The Committee will be instrumental in developing the Social and Economic components of the Atlantic Coast Cooperative Statistics Program. The incumbent worked closely with economists at Woods Hole to prepare documentation that would direct the work of the Committee. The full Committee met in September in Philadelphia, PA to begin the task of developing the ACCSP. The Economist was also very active with the Commercial Statistics Technical Committee assisting in their portion of the ACCSP design. Meetings were attended in Warwick, RI, Norfolk, VA, Washington, DC and again in Warwick, RI during the project period.

Related to the ACCSP program and it's implications for the development of state of the art fisheries data collection systems, the Fisheries Economist investigated a number of technological solutions that could be applied to the Program. A seminar on the use of Optical Character Recognition (OCR) was attended with the Project Leader. A proposal for the use of OCR in the collection of Massachusetts commercial lobster data was written and has been forwarded to a few different agencies for their consideration.

Job 5: Data Entry/Receptionist

The Division's MIS/Statistics Program currently provides data entry services to the IS/Statistics section and then to other Division projects and programs on an "as time permits" basis. The increasing amount of data needed, both by the state and federal agencies involved in the development and monitoring of fisheries management plans, has in the past, resulted in a back-log of research data entry, and, at times, a delay in the production of timely management data. In addition, the anticipation of substantial fishery management plan development for lobster, squid, sea bass, scup, and tautog indicate that additional monitoring data for these fisheries will be required.

The position of Data Entry Clerk was filled on the first of the year from a temporary services contract with the Commonwealth. The Project Economist trained the Clerk in most aspects of the Statistics Project and the Quota Monitoring Project and the data entry needs for these projects. Additionally, the data entry clerk provided data entry service to the Division's Lobster Biology Project and the Sportfisheries Project. The clerk assisted the Fisheries Economist in the data entry and quality control of the Northern Shrimp Sampling database discussed in Job 2.

Job 6. Telephone System Replacement

Funding from this grant was used to upgrade the rotary phone system at the Cat Cove Marine Laboratory. A Panasonic Digital Business System with voice mail capabilities was purchased and installed at the facility. The new system will be moved in November to the Division's new facility in Gloucester.

Job 7. Fisheries Conservation Engineering

The purpose of this job was to study the modification of certain types of gear to reduce the catch of untargeted species and to insure a high rate of survival of bycatch. Two problems were identified:

1. The reduction of scup during squid fishing: The concentrated fishery for squid occurs during the spring and early summer in the shallow waters of Vineyard and Nantucket Sound. Sea samplers were placed on fishing vessels that targeted squid and catch scup. The

intent was to observe the catch and to video document the behavior of the squid and the scup at the mouth of the trawl net. These observations would give insight into possible means to reduce or eliminate the scup bycatch. Some footage was obtained. This footage provides preliminary suggestions that may be effective. The possibilities relate to towing speed and the manner in which the trawl first encounters the bottom.

2. To reduce the bycatch of summer flounder and seek means to increase discard survival: Efforts to work during the fall, prior to termination of the project year were stymied by a new procurement of services system. Attempts were made to charter vessels, but contracts were not awarded prior to the end of the project year. Therefore, no fall trips were made.

No major expenditures of ACFCMA funds on equipment or vessel contracts were made.