SFC APPROVED BY Dmk DATE 3/02/01

UNITED STATES
DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Region
State, Federal & Constituent Programs Office

Completion
ANNUAL REPORT

Grantee: **MAINE DEPARTMENT OF MARINE RESOURCES**

Project No: **3-ACA-063**

Grant No: **NA96FG0180**9

Project Title: **RECREATIONAL AND COMMERCIAL SURVEYS OF MAINE FISHERIES**

Period Covered: **05/01/99 - 09/30/00**

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Date: **FEBRUARY 6, 2001**

Statutory Funding Authority:
___Anadromous Fish Conservation Act (P.L. 89-304)
___Chesapeake Bay Studies
___Endangered Species Act
___Interjurisdictional Fisheries Act (Title III of P.L. 99-659)
___Magnuson Act
___Oyster Disease Research
___Saltonstall-Kennedy
___Unallied Industry Projects
___Unallied Science Projects
_X_ACFCMA

UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
State, Federal and Constituent Program

Recreational and Commercial Surveys of Maine Fisheries

State: Maine
Project # 3-ACA-0355
Grant # NA96FG0189

May 1, 1999 – September 30, 2000

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January 16, 2001

Recreational and Commercial Surveys of Maine Fisheries

May 1, 1999 - September 30, 2000
Project # 3-ACA-0355
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Job #1: ***Conduct a recreational fisheries statistics intercept survey of the charterboat fleet***
Job #2: ***Charterboat Captain volunteer reporting log***

In 1995 the National Marine Fisheries Service (NMFS) and the Maine Department of Marine Resources (DMR) modified the Marine Fisheries Statistics Survey (MRFSS) in the party/charter mode. To evaluate an alternative methodology for obtaining catch and effort data, a side-by-side comparison was made to provide a method of assessing the accuracy/quality of interviews obtained from charterboat anglers. Preparatory work for both the field intercept and telephone portions of the "Charter-Only" survey is initiated each May. More specifically, all charter vessel Captains formerly participating in the modified survey were contacted in order to request their continued cooperation, as well as to discuss any possible changes for the upcoming recreational fishing season. Captains new to the charter fleet were located and introduced to the MRFSS, and their support solicited and secured. Trip forms, instructions, and informational materials necessary to the success of the survey were produced and distributed to participants. Additionally, all "for-hire" Captains were provided with an application to complete and return if they wished their recreational charter fishing business to be advertised on the Portland Press Herald/Maine Sunday Telegram internet list of Maine charter vessels at website *http://www.destinationmaine.com/fishing/bruce.htm*. A printed list of Maine's "for-hire" fleet was also produced for distribution to the inquiring public.

"Charter-Only" Field Intercept Survey

The successful completion of an assignment requires that the Captain of a randomly selected charter vessel be contacted the night prior to the interviewing/sampling event in order to ascertain whether or not he/she has a fishing trip scheduled for the following day. If the Captain has no trip slated for that day, or if contact cannot be made, an endeavor is made to reach the Captain of the next closest (1st alternate site) charter vessel to the one assigned. If that too proves unsuccessful, contact with a third Captain (second alternate site) is attempted. Once a vessel has been located, preparatory work includes determination of when and where the vessel will be coming in. Upon arrival at the dock, the field interviewer requests permission to interview each angler. The standard MRFSS questionnaire is completed for each cooperating angler as well as a modified Captain's intercept questionnaire and any available catch is weighed and measured. After each completed assignment, all forms are reviewed for discrepancies and corrected if necessary. On a weekly basis, forms are copied and forwarded to Macro International, the company contracted by the NMFS to provide data entry.

1999 SEASON
WAVE 3, 1999

In June, field intercepts of randomly selected charter vessels began, and seventeen attempts to contact charter Captains were necessary in order to complete nine assignments. As can be seen in the following table, twenty-six of a possible twenty-six angler interviews were

obtained, as well as nine Captain interviews. In all, thirty-five intercepts were completed in Wave 3 (May - June; *see note following Table 2) against a NMFS quota of thirty-two.

Table 1, below, summarizes several survey elements and provides an outline of trip/angler activity in Wave 3. Table 2 profiles the species breakdown and disposition of the catch taken by Wave 3 "Charter-Only" anglers.

Date	# anglers fishing	# anglers int	Capt int	Water body	Target species	Site	Reason for alternate site
6/06	6	6	yes	ocean	none	1	
6/07	2	2	yes	river	striped bass	2	Unable to reach Captain
6/10	1	1	yes	river	striped bass	2	No activity; weather favorable
6/13	2	2	yes	river	striped bass	3	No activity; weather favorable
6/18	3	3	yes	river	striped bass	1	
6/18	4	4	yes	river	striped bass	2	No activity; weather favorable
6/18	2	2	yes	river	striped bass	3	Unable to reach Captain
6/20	4	4	yes	ocean	striped bass	1	
6/29	2	2	yes	river	striped bass	2	Unable to reach Captain
Totals	26	26	9				

Table 1. Wave 3 field intercept activity in the "Charter-Only" survey. From left to right, the columns read: trip date, number of anglers fishing, number of angler intercepts obtained, if a Captain comparison interview was obtained, water body fished, species targeted, site sampled (1=assigned site, 2=1st alternate site; 3=2nd alternate site), and the reason for sampling an alternate site.

Species and Disposition	River	Bay	Ocean
Striped bass - D1			1
Striped bass - D2	63		4
Striped bass - D3			3
Mackerel - D4			35
Pollock - D1			14
Pollock - D2			51
Pollock - D3			5
Pollock - D4			10
Haddock - D2			19
Haddock - D3			13
Cod - D2			21
Cod - D3			12
Wolfish - D3			3
Longhorn sculpin - D1			1
Dogfish - D1			50

Table 2. Wave 3 catch data. *Key to Disposition Codes: D1 - Thrown back alive/legal; D2 - Thrown back alive/not legal; D3 - Eaten/plan to eat; D4 - Used for bait/plan to use for bait*

In Maine, charter activity is limited prior to June and after mid-September; hence no intercepts are obtained in the month of May in Wave 3 (May-June) or in October in Wave 5 (Sept-Oct.).

WAVE 4, 1999

In Wave 4 (July-August), forty-five attempts to contact charter Captains were necessary to complete twenty-three assignments. Of eighty-one anglers fishing, seventy were interviewed. Captain interviews were obtained on all twenty-three completed assignments. In all, ninety-three interviews were collected for the wave, surpassing the quota of seventy-five established by the NMFS.

Table 3 outlines trip/angler activity for those trips intercepted in Wave 4, while Table 4 indicates catch by species and disposition.

Date	# anglers fishing	# anglers int	Capt int	Water body	Target species	Site	Reason for alternate site
7/09	4	4	yes	ocean	striped bass	2	Unable to reach Captain
7/10	6	0 boat in early	yes	ocean	striped bass	2	No activity; weather favorable
7/11	2	2	yes	ocean	striped bass	1	
7/14	2	2	yes	river	striped bass	2	Assigned vessel didn't show
7/17	6	6	yes	ocean	striped bass	2	Unable to reach Captain
7/17	4	4	yes	ocean	striped bass	2	Unable to reach Captain
7/18	5	5	yes	ocean	striped bass	2	Unable to reach Captain
7/18	4	4	yes	ocean	striped bass	2	No activity/weather favorable
7/21	3	3	yes	ocean	striped bass	3	Unable to reach Captain
7/25	3	3	yes	ocean	blue shark	3	No activity; weather favorable
7/30	5	5	yes	ocean	blue shark	2	Unable to reach Captain
8/06	2	2	yes	ocean	striped bass	1	
8/06	4	4	yes	river	striped bass	2	Unable to reach Captain
8/07	1	1	yes	ocean	striped bass	1	
8/07	2	2	yes	ocean	striped bass	2	Unable to reach Captain
8/12	2	2	yes	river	striped bass	3	No activity; weather favorable
8/12	5	5	yes	ocean	cod	1	
8/14	6	4	yes	river	striped bass	2	No activity; weather favorable
8/20	3	3	yes	ocean	blue shark	2	Unable to reach Captain
8/21	2	0, late to boat	yes	ocean	striped bass	2	Unable to reach Captain
8/23	3	2	yes	ocean	striped bass	2	Unable to reach Captain
8/25	3	3	yes	river	striped bass	2	No activity; weather favorable
8/31	4	4	yes	ocean	striped bass	2	No activity; weather favorable
Totals	81	70	23				

Table 3. Wave 4 field intercept activity. From left to right, columns read: trip date, number of anglers fishing, number of angler intercepts obtained, if a Captain comparison intercept was obtained, water body fished, species targeted, site sampled (1=assigned site; 2=1st alternate site; 3=2nd alternate site), and the reason for sampling an alternate site.

Species and Disposition	*River*	*Bay*	*Ocean*
Striped bass - D1	2		7
Striped bass - D2	74		100
Striped bass - D3	7		18
Mackerel - D4	20		436
Pollock - D1			32
Pollock - D3			6
Pollock - D4			2
Haddock - D3			3
Cod - D2			4
Cod - D3			11
Cusk - D1			1
Cusk - D3			2
Whiting - D1			1
Bluefish - D1	3		
Bluefish - D3	1		
Dogfish - D1			1
Blue Shark - D1			1
Blue Shark - D3			1

Table 4. Wave 4 catch data. (See ***Key to Disposition Codes*** following Table 2)

WAVE 5, 1999

Nineteen attempts to contact charter Captains were required in Wave 5 to complete nine "Charter-Only" assignments. Thirty-two out of a possible forty-three anglers were interviewed, as well as nine Captains, for a total of forty-one interviews for the wave. (September-October; *see note following Table 2). The NMFS quota for the wave was thirty-two interviews.

Trip and angler activity for the nine "Charter-Only" trips interviewed in Wave 5 are outlined in Table 5. Table 6 profiles the Wave 5 catch by species and disposition, and Table 7 summarizes, by wave, the states/provinces/countries of residence of the anglers interviewed in 1999 as part of the "Charter-Only" survey.

Date	*# anglers fishing*	*# anglers int*	*Capt int*	*Water body*	*Target species*	*Site*	*Reason for alternate site*
9/03	5	5	yes	river	striped bass	3	No activity; weather favorabl
9/06	6	6	yes	ocean	striped bass	3	No activity; weather favorabl
9/10	3	3	yes	ocean	striped bass	2	No activity; weather poor
9/11	2	2	yes	river	striped bass	2	No activity; weather favorabl
9/12	6	0 boat in early	yes	ocean	mackerel	2	No activity; weather favorabl
9/14	2	0 anglers in hurry	yes	ocean	striped bass	1	
9/19	7	7	yes	ocean	cod	2	Unable to reach Captain
9/20	5	2	yes	river	mackerel	2	No activity; weather favorabl
9/24	7	7	yes	ocean	cod	2	No activity; weather favorabl
Totals	43	32	9				

Table 5. Wave 5 field intercept data. From left to right the columns read: trip date, number of anglers fishing, number of angler intercepts obtained, if a Captain comparison intercept was obtained, water body fished, species targeted, site sampled (1=assigned site; 2=1st alternate site; 3=2nd alternate site), and the reason for sampling an alternate site.

Species and Disposition	*River*	*Bay*	*Ocean*
Striped bass - D1	1		3
Striped bass - D2	8		44
Striped bass - D3			8
Mackerel - D1	29		
Mackerel - D3	5		
Mackerel - D4	78		11
Pollock - D1			48
Pollock - D2			64
Pollock - D4			8
Haddock - D2			3
Haddock - D3			2
Cod - D2			35
Cod - D3			36
Cusk - D1			9
Cusk - D3			9
Redfish - D2			4
Bluefish - D3			2
Longhorn sculpin - D1			4
Sea raven - D1			1
Spiny dogfish - D1			3

Table 6. Wave 5 catch data. (See ***Key to Disposition Codes*** following Table 2)

State/Country of Residence	*Wave 3*	*Wave 4*	*Wave 5*
Maine	8	11	5
New Hampshire		9	6
Vermont	6		13
Massachusetts	2	9	1
Connecticut		3	
New York		7	4
New Jersey		5	
Pennsylvania	2	3	2
Ohio		2	
Indiana	2		
Michigan	2		1
Missouri		6	
Nebraska		3	
Texas	3	2	
Florida		5	
Puerto Rico		2	
Aruba	1		
Belgium		3	
Totals	26	70	32

Table 7. Residential distribution of anglers interviewed as part of the "Charter-Only" survey. Organized by wave, the table indicates the number of interviewees who reside in the various states, provinces (if Canadian) or countries (if not U.S.) listed.

1999 Charter Activity Telephone Survey

The telephone survey portion of the "Charter-Only" project requires that five randomly chosen Captains be contacted each week of the charter season (the first week of June through the last week of September). Up to five phone attempts are made to contact the selected Captain before an alternate Captain is called. Once contact is made, the Captain is queried as to the number of trips made during the survey week, the number of anglers per trip, and the departure and return times. Data obtained as part of the telephone survey will be expanded to approximate the total number of trips made by the charter fleet in any given week, and hence for the recreational fishing season. Table 8 profiles by wave the information gathered as part of the 1999 telephone survey.

	Wave 3	Wave 4	Wave 5
Average no. of calls/contact	3.5	3.9	2.6
Average no. of trips/ week/capt. with trips	5.6	5.7	2.2
Average no. of anglers/trip	4.3	4.3	3.9
Average length of trip, in hours	5.6	5.8	6

Table 8. 1999 phone survey summary.

2000 SEASON
WAVE 3, 2000

In June, field intercepts of randomly selected charter vessels began. Twenty-nine attempts to contact charter captains were necessary in order to complete fifteen assignments. As can be seen in the table below, thirty-one of a possible forty angler interviews were obtained along with fifteen captain interviews. In all, forty-six intercepts were completed in Wave 3 (May – June); [* see note following Table 2] against a NMFS quota of thirty-two.

Table 9 summarizes several survey elements and provides an outline of trip/angler activity in Wave 3. Table 10 profiles the species breakdown and disposition of catch taken by Wave 3 "Charter-Only" anglers.

Date	# anglers fishing	# anglers int	Capt int	Water body	Target species	Site	Reason for alternate site
6/04	6	2	yes	ocean	cod	3	Unable to reach captain
6/04	4	4	yes	ocean	striped bass	1	
6/09	2	2	yes	river	striped bass	2	Unable to reach captain
6/16	1	0	yes	ocean	striped bass	2	Unable to reach captain
6/16	2	0	yes	ocean	none	2	No activity; weather favorable
6/17	1	1	yes	river	striped bass	3	Hostile site
6/17	5	5	yes	river	striped bass	2	No activity; weather favorable
6/18	2	0	yes	ocean	mackerel	1	
6/19	3	3	yes	river	striped bass	1	
6/22	2	2	yes	river	striped bass	2	Unable to reach captain
6/22	2	2	yes	river	striped bass	2	Unable to reach captain
6/23	2	2	yes	river	striped bass	2	No activity
6/23	1	1	yes	river	striped bass	2	Unable to reach captain
6/23	2	2	yes	river	striped bass	2	Unable to reach captain
6/29	5	5	yes	ocean	striped bass	2	No activity
Totals	40	31	15				

Table 9. Wave 3 field intercept activity in the "Charter-Only" survey. From left to right the columns read: trip date, number of anglers fishing, number of angler intercepts obtained, if a captain comparison interview was obtained, water body fished, species targeted, site sampled (1 = assigned site, 2=1st alternate site, 3=2nd alternate site), and the reason for sampling an alternate site.

Species and Disposition	River	Bay	Ocean
Striped bass - D2	141		
Striped bass - D3			1
Mackerel – D1	1		
Mackerel – D3			15
Mackerel - D4			125
Pollock - D1			6
Pollock - D2			244
Haddock - D3			1
Cod - D2			10
Cod - D3			6
Cusk – D3			1

Table 10. Wave 3 catch data. *Key to Disposition Codes: D1 - Thrown back alive/legal; D2 - Thrown back alive/not legal; D3 - Eaten/plan to eat; D4 - Used for bait/plan to use for bait*

WAVE 4, 2000

In Wave 4 (July – August), twenty-nine attempts to contact charter captains were necessary to complete seventeen assignments. Of seventy-six anglers fishing, seventy-two were interviewed. Captain interviews were obtained on all seventeen completed assignments. In all, eighty-nine interviews were collected for the wave, surpassing the quota of seventy-five established by the NMFS.

Table 11 outlines trip/angler activity for those trips intercepted in Wave 4, while Table 12 indicates catch by species and disposition.

Date	# anglers fishing	# anglers int	Capt int	Water body	Target species	Site	Reason for alternate site
7/07	4	4	yes	bay	striped bass	2	Unable to reach captain
7/08	6	6	yes	ocean	cod	1	
7/09	6	4	yes	river	striped bass	2	Unable to reach captain
7/10	2	2	yes	river	striped bass	2	No activity; weather favorable
7/13	6	5	yes	ocean	striped bass	2	Unable to reach captain
7/14	2	2	yes	ocean	striped bass	2	Unable to reach captain
7/21	6	6	yes	river	striped bass	2	No activity; weather favorable
7/22	5	4	yes	river	striped bass	2	Unable to reach captain
7/23	2	2	yes	bay	striped bass	2	Unable to reach captain
8/06	4	4	yes	ocean	striped bass	2	No activity; weather favorable
8/09	6	6	yes	river	striped bass	1	
8/13	5	5	yes	ocean	striped bass	1	
8/14	5	5	yes	ocean	striped bass	1	
8/20	5	5	yes	ocean	striped bass	2	No activity; weather favorable
8/20	2	2	yes	ocean	striped bass	1	
8/25	5	5	yes	river	striped bass	2	Unable to reach captain
8/27	5	5	yes	ocean	striped bass	2	Unable to reach captain
Totals	76	72	17				

Table 11. Wave 4 field intercept activity. From left to right, columns read: trip date, number of anglers fishing, number of angler intercepts obtained, if a Captain comparison intercept was obtained, water body fished, species targeted, site sampled (1=assigned site; 2=1st alternate site; 3=2nd alternate site), and the reason that sampling an alternate site was necessary.

Species and Disposition	*River*	*Bay*	*Ocean*
Striped bass - D1	2	2	2
Striped bass - D2	41	7	22
Striped bass - D3	16	3	25
Mackerel – D1	40	60	70
Mackerel - D4	90	74	136
Pollock - D1			12
Pollock – D2			43
Pollock - D4			60
Cod - D2			16
Cod - D3			6
Cunner – D3			1
Redfish – D2			1
Bluefish - D3	1		
LH Sculpin – D1			12

Table 12. Wave 4 catch data. (See *Key to Disposition Codes* following Table 2)

WAVE 5, 2000

Twenty-two attempts to contact charter captains were required in Wave 5 to complete ten "Charter-Only" assignments. Thirty-three out of a possible thirty-three anglers were interviewed, as well as ten captains, for a total of forty-three interviews for the wave (September – October; *see note following Table 2). The NMFS quota for the wave was thirty-two interviews.

Trip and angler activity for the ten "Charter-Only" trips interviewed in Wave 5 are outlined in Table 13. Table 14 profiles the Wave 5 catch by species and disposition, and Table 15 summarizes, by wave, the states/countries of residence of the anglers interviewed in 2000 as part of the "Charter-Only" survey.

Date	# anglers fishing	# anglers int	Capt int	water body	Target species	Site	Reason for alternate site
9/08	2	2	yes	river	striped bass	2	Unable to reach captain
9/09	2	2	yes	river	striped bass	2	Unable to reach captain
9/09	1	1	yes	bay	striped bass	2	Unable to reach captain
9/10	2	2	yes	river	striped bass	3	No activity; weather favorable
9/10	3	3	yes	ocean	striped bass	2	No activity; weather favorable
9/16	2	2	yes	ocean	striped bass	3	Unable to reach captain
9/16	6	6	yes	ocean	striped bass	2	No activity; weather favorable
9/19	5	5	yes	bay	striped bass	2	No activity; weather favorable
9/23	6	6	yes	ocean	blue shark	2	Unable to reach captain
9/27	4	4	yes	ocean	cod	2	Unable to reach captain
Totals	33	33	10				

Table 13. Wave 5 field intercept data. From left to right the columns read: trip date, number of anglers fishing, number of angler intercepts obtained, if a Captain comparison intercept was obtained, water body fished, species targeted, site sampled (1=assigned site; 2=1st alternate site; 3=2nd alternate site), and the reason for sampling an alternate site.

Species and Disposition	River	Bay	Ocean
Striped bass - D1	3	1	
Striped bass - D2	26	9	
Striped bass - D3	1		2
Mackerel - D1			100
Mackerel - D3			15
Mackerel - D4	12		125
Pollock - D2			1
Pollock – D3			2
Haddock - D2			10
Haddock - D3			6
Cod - D2			51
Cod - D3			18
Cusk - D1			30
Red hake – D3			1
Blue shark – D1			1

Table 14. Wave 5 catch data. (See *Key to Disposition Codes* following Table 2)

State/Country of Residence	Wave 3	Wave 4	Wave 5
Maine	13	15	12
New Hampshire	4	12	
Vermont	1	4	4
Massachusetts		10	6
Connecticut		8	
New York	3	7	
New Jersey	3	1	1
Virginia		1	
Georgia	1		
Florida	1	2	2
Indiana		1	
Michigan			1
Wisconsin			2
Texas	1	4	3
Kansas	1		
Nevada			2
Colorado	1		
California	2	4	
England		3	
Totals	31	72	33

Table 15. Residential distribution of anglers interviewed as part of the "Charter-Only" survey.

2000 Charter Activity Telephone Survey

The telephone survey portion of the "Charter-Only" project requires that seven randomly chosen captains be contacted for each week of the charter season, starting with the first week of June and continuing through the last week of September, 18 weeks in all. Up to five attempts are made to contact each captain before an alternate captain is called. Once contact is made, the captains are queried as to the number of trips made during the survey week, the number of anglers per trip, and departure and return times. Data obtained as part of the phone survey can be expanded to approximate the total number of trips made by the charter fleet in any given week, and hence for the recreational fishing season. Table 16 below profiles the information gathered as part of the 2000 phone survey, by wave.

	Wave 3	Wave 4	Wave 5
Average no. of calls/contact	4.2	5.2	4.7
Average no. of trips/ week/capt. with trips	2.9	4.9	3.7
Average no. of anglers/trip	3.2	3.3	3.6
Average length of trip in hours	5.6	5.5	4.9

Table 16. 2000 phone survey summary.

Job #3: ***Conduct a logbook survey of volunteer anglers***

To supplement the information on striped bass and bluefish collected from the MRFSS in the shore and private/rental modes, a volunteer angler logbook was implemented. This survey is designed to collect trip and catch information. Briefly, this program targets avid striped bass fishermen and is a means of collecting additional length data. This additional data is necessary even though we have increased the sample size of our recreational MRFSS survey, which misses lengths and weights on sub-legal or released stripers because Maine's striped bass fishery has bag limits coupled with the fact many anglers opt for catch and release, field interviewers actually see extremely limited numbers of fish. The program is quite simple. An angler records fish caught and or released during each trip for him/herself and any fishing companions. Other information collected includes: time spent fishing, area fished, number of anglers and target species. At the end of the season each angler mails back his/her logbook that we then copy and return. Participants are solicited at sportsman's shows, on the Internet, at sportfishing clubs, and in newsletters/newspapers.

1999

A total of 168 logbooks were distributed for the 1999 season of which 73 were returned. This represents a return rate of about 43%, up from the 33% return rate we had for 1998. Logbooks were reviewed, edited and coded in preparation for data entry. The logbook data, including date, number of anglers, effort, areas fished, species targeted, species captured, and lengths and weights of individuals caught, was then entered into a computer database. A preliminary summary of the 73 logbooks follows:

Catch/effort data

- The 73 logbook keepers reported 1,977 fishing trips which when multiplied by the number of logbook keeper and their fishing companions results in 3,585 individual angler trips. The 73 logbook keepers and their fishing companions spent in excess of 12,500 hours fishing. Of the 1,977 fishing trips reported 1,720-targeted stripers.
- A total of 10,191 ***striped bass*** were caught, of which 773 were kept and the other 9,418 were released. Lengths were measured or estimated for 8,637 striped bass. Anglers measured 3,352 stripers that were in the slot (20"-26") of which 2,595 were released and 757 were retained. Twenty fish were measured over 40" of which 13 were released and 7 were retained. Anglers measured 5,265 fish that were not of legal size. Table 1 summarizes the striped bass length frequency distribution (measured only) for 1999.
- A total of 557 ***bluefish*** were caught of which 164 were kept and 393 were released.
- A total of 10,293 ***mackerel*** were caught with 9,443 kept.
- In addition to the aforementioned species the following were also reported as being caught:

Alewife, Atlantic moonfish, Atlantic salmon, blue shark, brown trout, cod, cunner, dogfish, flounder, haddock, hake, herring, mako shark, ocean pout, pollock, porbeagle shark, rainbow trout, redfish, shad, skate, small mouth bass, smelt, sturgeon, tautog, thresher shark, tuna, winter flounder, and wolfish.

Trip details

Fishing platform: (reports from 1,965 fishing trips) 1,377 were taken from a boat; 13 were from a jetty; 62 were from a pier/dock and 517 were taken from shore.

Trip cost: (1,446 trips) The average cost per trip was $28.25.

Trip type: (1,917 trips) 272 charter/party trips; 1,640 self/family/friend trips; 9 tournament trips.

Terminal gear: (1,967 trips) bait was used during 730 trips, flies on 627 trips while lures were used on 1,201 trips.

Hook type: (1,912 trips) barbless hooks were used on 683 trips, circle hooks were used on 126 trips and conventional hooks were used on 1,239 trips.

2000

A total of 200 logbooks were distributed for the 2000 season.

Job #4 Monitoring of northern shrimp fishery and other commercial and recreational fisheries.

ACA ANNUAL REPORT
Commercial Lobster Sea Sampling
Carl Wilson, ***project leader***

Introduction

The Department of Marine Resources (DMR) is committed to monitoring the health of the lobster fishery in Maine. In 2000, the DMR successfully executed an ambitious at sea sampling program from May through November. With the exception of May and October, DMR samplers were able to achieve or exceed the sampling plans. Over the seven months of sampling, 148 full day sampling trips were completed, representing 31,430 trap hauls, 104,373 lobsters and 1,297 hours on the water. On average, samplers were able to measure the entire contents of 97% of the traps that were hauled an increase of 60% over 1999. The 2000 catch was characterized by a very slow May and June and a remarkably strong July and August. Eastern Maine, zones A-C, are likely to report record catches, western zones were stable or slightly up. This was the final year of a maximum trap limit reduction to 800 traps per license holder.

The DMR has concluded it's most extensive sampling program for lobsters to date. Participating DMR staff have been asked to "do more with less" and have responded to the challenge. With landings for 2000 expected to top 50 million pounds in Maine for the second time ever, it is critical that the DMR continue to monitor catch and effort changes in the lobster fishery, and look for ways to improve our knowledge of the lobster resource.

Methods

The sea sampling program design calls for each of 7 lobster management zones to be sampled three times each month from May through November. This design was unchanged since 1998. However, several sampling protocol changes were made for 2000 that enabled the team of samplers to efficiently collect and archive data. The most significant change was to collect data using voice activated recorders; this allows one observer to collect more data than two were able to do previously. Shell condition (soft and hard) was added to the list of biological parameters recorded for each lobster, allowing seasonal analysis of the molting cycle in each zone. Location data (Loran and Latitude/Longitude) was collected in previous years, but was not stored in the lobster database. Location fields were added to the sea sampling database allowing spatial analysis to be completed in the future.

Results

May and October were the only months samplers were unable to complete the scheduled 21 sampling trips (table 1).

	May	June	July	August	September	October	November	Totals
Trips	16	23	24	23	21	20	21	**148**
Trap Hauls	2783	4539	5297	5285	4803	3930	4793	**31430**

Table 1. Number of at sea sampling trips and trap hauls measured each month during the 2000 sampling season. Each month a total of 21 trips were scheduled (7 zones, 3 trips in each zone).

A total of 148 full day sea sampling trips were completed in the 2000 sampling season. On average, 220 traps were hauled over the course of a 9-hour day. Herring was the dominant bait used (77% by weight) with redfish (8 %) a distant second.

DMR sea samplers counted, measured and sexed all lobsters in 96.7% of all traps hauled while on board, a significant increase from 1999 (35%). Some data was lost (<5%) due to recorder or sampler error, this was considered an acceptable tradeoff given the increased sampling size.

All lobster zones saw an increase in the catch per trap haul of legal lobsters (CPT) (Figure 1). Zone C saw the most significant increase from 1.2 to 1.7 CPT. Mid-coast zones (C, D and E) have consistently had a higher CPT in all three years of the expanded sea sampling program.

The most recent lobster stock assessment (ASMFC 2000) indicates that the Gulf of Maine lobster resource is growth overfished, meaning the length frequency of lobsters are greatly truncated resulting in a low average size. The average size of lobsters (females, males, v-notch and egg bearing females) greater than 82 mm CL varies from east to west (Figure 2). In 2000, Zone A (east) had the highest average sizes for egg bearing (109 mm CL) and v-notch (102 mm CL) lobsters in the state. In contrast zone F (west) had the lowest average size for egg bearing (91 mm CL), and v-notch (90 mm CL) lobsters. The average size of males and all females showed little or no trend by zone (Figure 2). The differences in average sizes for protected (v-notch and egg bearing) may be a reflection of local environmental conditions that may influence size at maturity. Water temperatures are lower in eastern Maine than in western Maine. Warmer temperatures have been found to lower the size at maturity for lobsters. Size differences between zones for both males and all females negligible (<2 mm CL), suggesting similar exploitation rates throughout the state.

One value of the sea sampling program is the information collected on the discarded components of the lobster catch. The numbers of sublegal, oversized, v-notch and egg bearing females can only be determined on the boat, and are not picked up using dockside survey methods. It is important to note over the course of the 2000 sampling season, 34.5% of the legal sized lobsters (>82 mm CL) were protected because they had eggs, were v-notched, or were oversized. The size distribution of males and females in traps was limited to lobsters >30 mm CL. There was a dramatic decline in frequency of lobsters caught <75 mm CL; this is most likely due to the ability of small lobsters to freely move out of traps through the escape vents (Figure 3 A and B). The size distribution of egg-bearing lobsters with no v-notch indicates a large percentage of egg-bearing lobsters below the minimum legal size (Figure 3 C), but when compared to egg-bearing lobsters with a v-notch this sub-legal spike is greatly reduced (Figure 3 D). The greatest proportion of egg-bearing and v-notch lobsters is >90 mm CL. The greatest numbers of females caught with no eggs or v-notch were <95 mm CL (Figure 3 B). Oversize lobsters (>127 mm CL) constituted 0.89% of the catch. The present protection of egg-bearing and v-notch lobsters does keep larger lobsters from being harvested in Maine.

Summary

The DMR lobster sea sampling program had a successful 2000 sampling season. An unprecedented level of effort was put forward to collect information on Maine's most valuable fishery. Trends in the legal catch rate have continued to rise since 1998 in all seven-lobster zones. Differences were observed in the catch, and average size of lobsters by zone. The average size of male lobsters did not change between zones; the average size of egg-bearing lobsters did. The protected or illegal portion of the catch (v-notch, egg bearing or oversize) constitutes a significant portion. Voluntary v-notching of egg-bearing females by the industry may be contributing to a larger average size of reproductive size female lobsters.

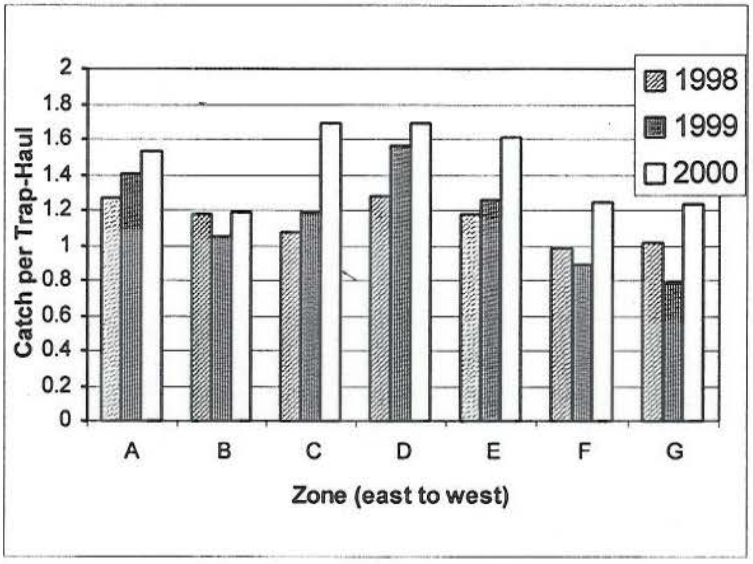

Figure 1., Average catch per trap haul by zone from 1998 to 2000. Zones run east (A) to west (G).

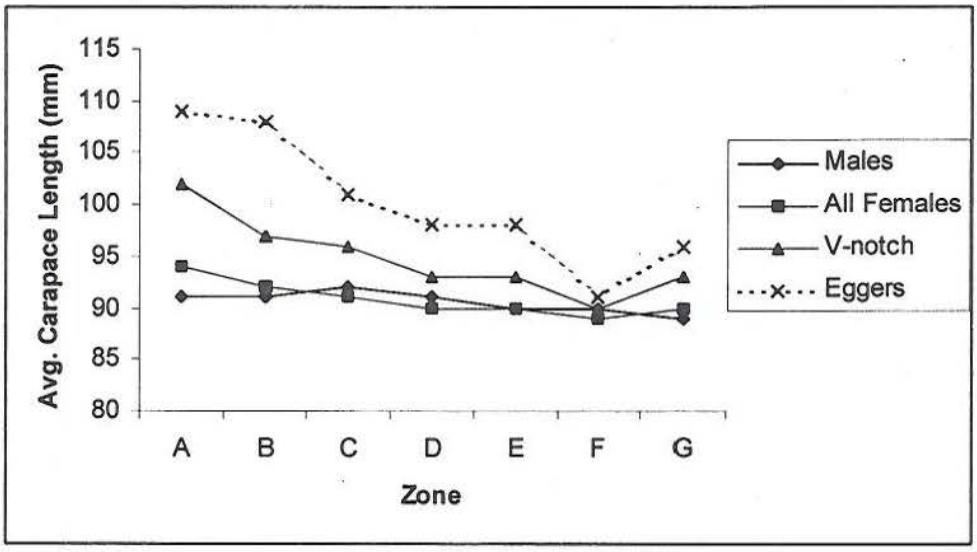

Figure 2., Average size (mm CL) of lobsters greater than the minimum legal size (>= 83 mm CL) for the months of May, June, July and August 2000. Males, all females, v-notch and egg bearing lobsters are indicated. Lobster management zones run east (A) to west (G) .

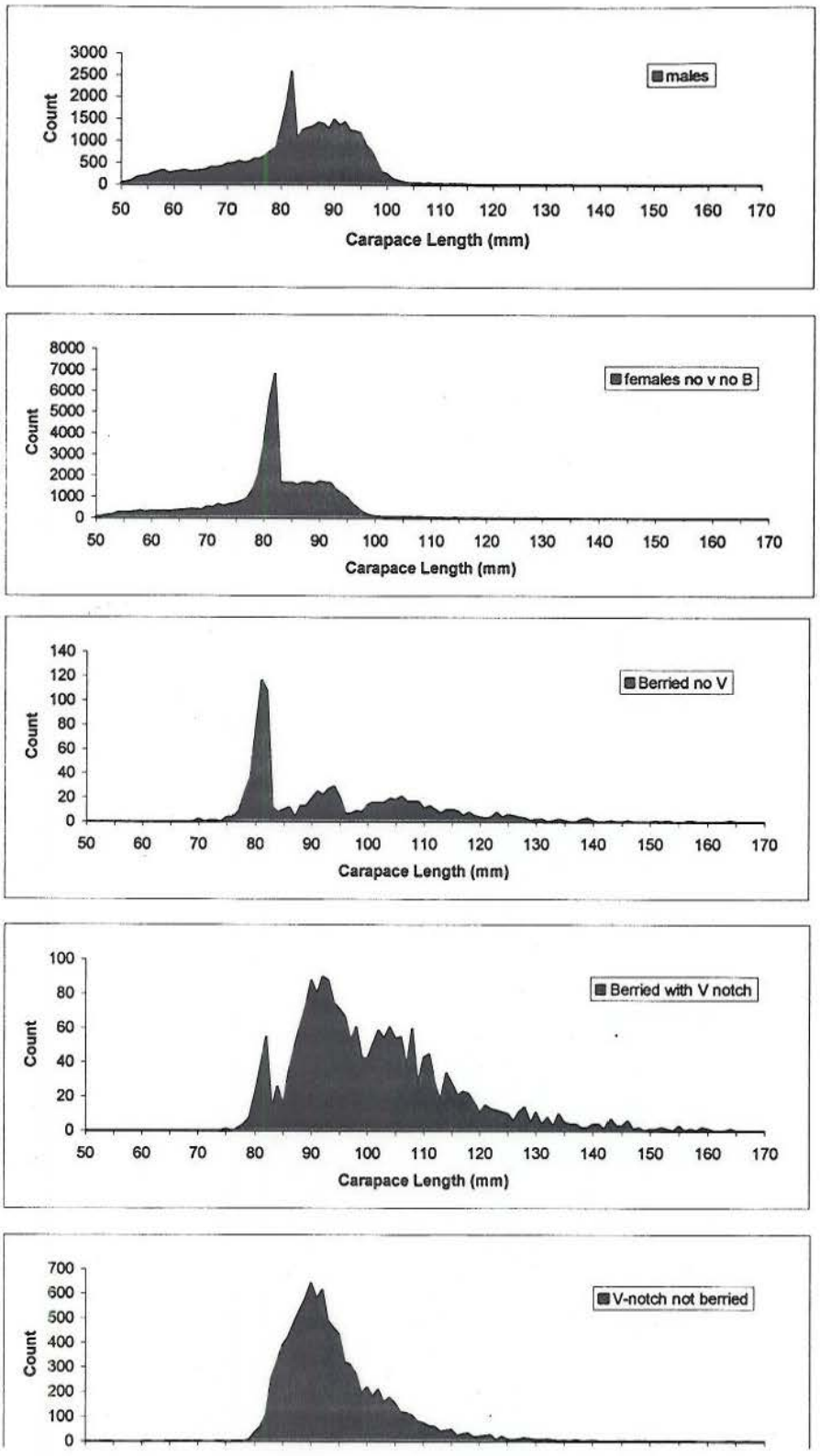

Figure 3., Length frequency for males (A), females with no eggs and no v-notch (B), berried females with no v-notch (C), berried with v-notch (D) and v-notch non-berried. All lobsters measured during May-November 2000 on board commercial lobster vessels.

ACA 2000 Annual Report

Commercial Shrimp Port Sampling Project

The commercial shrimp port sampling project is conducted by the Maine Department of Marine Resources Biological Monitoring Division headquartered at West Boothbay Harbor.

Purpose

The purpose of this project is to furnish sufficient biological and catch/effort information about the commercial shrimp fishery to the Department's Assessment and Statistics people so they, in conjunction with the Atlantic States Marine Fisheries Commission's Northern Shrimp Technical Committee, will be able to offer the best scientific advice available to fishery managers. We do this by collecting samples from many individual fishing grounds, gathering catch and effort information through captain interviews at various fishing ports, and by completing laboratory analyses of the shrimp collected.

Sampling and Laboratory Procedures

During our boat captain interviews the following information is recorded, depending on whether the boat is a dragger or trapper: Date, Dealer, Boat name, Catch Location, Depth fished, Total hours of drag time, Number of tows, Number of Traps, Number of days the traps have been set, Total pounds caught, Comments, Number in crew and Captain's name. Permission is asked of the captain to take a 2 lb sample from his catch back to Boothbay Harbor for laboratory analyses. Samples are purchased at $3.00 for a 2 lb sample.

For each dragger sampled, information from the interview forms is used to determine the total catch of the vessels sampled at each dealer, the total drag time, the range of catches in pounds, the average catch in pounds per boat, the average catch per unit of effort (CPUE) expressed in lbs/hr drag time for each vessel, the range of CPUE's, and the average CPUE for the vessels sampled.

From the information gathered from trappers, the total catch of the trappers sampled at each dealer, the total number of traps fished, the total soak time, the range of catches in pounds, the average catch/vessel in lbs, the range of catches in lbs/trap, and the average catch/trap is calculated. The boat price for the shrimp on that day by both draggers and trappers is recorded.

We also maintain/update discrete lists of fishing grounds from which the samples are harvested, vessels sampled, and dealer sites utilized so the lists can be reviewed and the sites/vessels readily selected to help lessen repeated sampling of the same body of shrimp, thus spatially broadening the sample base.

Shrimp are processed in the laboratory in order to generate sex - specific length frequency distributions, thus providing information on the size and age composition of the catch from different fishing grounds.

ACA support for shrimp port sampling (Job #4) consists of a specialist's time from December, 1999 through April, 2000.

Between December, 1999 and April, 2000 ACA support assisted the Commercial Shrimp Port Sampling Project by collecting samples and interviewing boat captains for catch information at

selected shrimp dealer locations along the Maine coast. The position was primarily responsible for processing shrimp in the laboratory in order to provide information on the size and age composition of the catch from different fishing grounds. The position also compiled/ tabulated/ recorded shrimp sample and port interview data in order to establish an accurate informational base for stock assessment, management and research purposes and assisted in the writing of weekly and monthly reports.

The position made 18 dealer visits from Portsmouth, NH to Port Clyde, Maine and collected 46 shrimp samples and corresponding captain interviews in the process. This work consisted of 3 visits in January (13 days allowed for dragging and trapping) for 8 samples, 9 visits in February (25 days allowed for dragging and trapping) for 26 samples and 6 visits in March (13 days allowed for dragging and trapping) for 13 samples. Since a total of 105 samples were taken during the 1998-1999 shrimp season, this represents 43.8 % of the field sampling.

Listed below are the dates of ACA supported field trips, the dealer location visited, the number of vessels sampled (and corresponding captain interviews) and the type of vessel (shrimp dragger or trapper) sampled at each visit.

1/19/00 Resource Trading Co., Portland	2 draggers
1/20/00 Shaw's Wharf, New Harbor	4 draggers
1/27/00 Portland Fish Exchange, Portland	2 draggers
2/02/00 Robinson's Wharf, Southport	2 trappers
2/03/00 Resource Trading Co., Portland	5 draggers
2/10/00 Pemaquid Fishermen's Co-op, Pemaquid	1 trapper
2/12/00 Kennebunkport Pier, Kennebunkport	3 draggers
2/15/00 Seahorse Fisheries, Phippsburg	1 dragger
2/15/00 Cundys Harbor Wharf, Cundys Harbor	2 draggers
2/17/00 Portland Fish Exchange, Portland	5 draggers
2/21/00 Kennebunkport Pier, Kennebunkport	3 draggers
2/24/00 Portsmouth Fishermen's Co-op, Portsmouth, NH	3 draggers
3/01/00 Thorbjornson's Wharf, Port Clyde	3 draggers
3/06/00 Friendship	1 trapper
3/07/00 Eugley's Wharf, South Bristol	1 dragger 1 trapper
3/07/00 Resource Trading Co., Portland	3 draggers
3/13/00 Portland Fish Exchange, Portland	1 dragger
3/14/00 Portsmouth Fishermen's Co-op, Portsmouth, NH	3 draggers

Results of the field trips and laboratory workup are incorporated into the overall monthly summaries of port sampling activities for northern shrimp conducted by DMR (Figures 1-3, Tables 1 and 2).

ACA annual report 2000 Figure 1

Commercial Shrimp Port Sampling. Monthly Report for January, 2000 (days 1 - 13 of the 51 day season).

This year's DMR port sampling team consists of Stuart Sherburne and Marilyn Metcalfe. Peter Marckoon, NMFS Port Agent in Rockland, who assisted us in past years by collecting samples and conducting captain interviews in Port Clyde, retired in December, 1999.

Port sampling of the 2000 season began on January 18, one day after the season opened. Opening day had a temperature of 0 degrees Fahrenheit, 60 knot winds (84 mph at Monhegan Is. at 6am) and snow. A few shrimpers did venture out and were completely surprised at their catches, based on predictions for a so-so season. One boat at Osier's Seafood in S. Bristol caught 7,600 lbs while another landed 6,000 lbs. Similar catches were reported for other boats along the coast. Bitter cold and rough seas with gale to storm force winds characterized most of the first 2 weeks of the season.

During the 13 days allowed for shrimping between January 17 - 31, we obtained shrimp samples and corresponding captain interviews for catch information from 23 draggers and 5 trappers at 7 dealers from Portland to New Harbor, Maine. The lengths of the sampled vessels ranged from 35' - 87'. The samples came from 18 different fishing grounds. The boat price started out at $1.10/lb but quickly dropped to $.75/lb due to the quantities of shrimp flooding the dealers. A processor in Portland (RTC) had hired only part of their normal crew, so could not handle all the shrimp coming in. RTC reported that the shrimp they were getting averaged 40 count. Another Portland processor had removed their processing equipment prior to the season. Boats on the 4th day of the season were put on quotas and a lot were in port by noon. Some catches during January remained unsold - at the Portland Fish Exchange on January 29, 27,876 lbs were landed and only 4,670 lbs sold at auction. The remainder had to be trucked elsewhere.

Boats were sampled at the following 7 dealers: Wotton's Lobster, Boothbay Harbor; Osier's Seafood, South Bristol; Resource Trading Co., Portland; Shaw's Wharf, New Harbor; South Bristol Co-op, S. Bristol; Cundys Harbor Wharf, Cundys Hbr. and the Portland Fish Exchange.

Catches were much greater than in January, 1999. Daily catches for the 23 draggers sampled ranged from 300 (gear problems) to 7,745 lbs, the average daily catch was 3,267.1 lbs., the range of catches in lbs/hr drag time (CPUE) was 106.6 - 1000 lbs/hr, while the average CPUE was 466.5 lbs/hr. (This compares with an average daily catch of 933.5 lbs and an average CPUE of 125.6 lbs/hr for 44 draggers returning from 1 day trips in January, 1999. And, the January, 1999 shrimp were smaller on average, often with counts of 60-65). The 5 trappers sampled had hauled 758 traps for a total of 8,987 lbs for an average catch of 11.9 lbs/trap. Trappers were not sampled in January, 1999. Boat price for trapped shrimp (which are cleaner than dragged) was the same price as for dragged shrimp.

ACA annual report 2000 Figure 2

Commercial Shrimp Port Sampling Monthly Report for February, 2000 (days 14 - 38 of the 51 day season).

Catches slacked off somewhat from the bountiful harvests of January but catches and CPUE's (lbs/hr drag time) were generally still good, surpassing those of February, 1999. The weather still hampered fishing with a lot of wind on many days. Shrimp were still of good count. Boat prices generally varied between $.70 - $.90/lb, depending on the dealer. Not only were catches good but fishermen reported large quantities of small male shrimp on the fishing grounds, contrary to what they said was predicted.

During the 25 days allowed for shrimping between February 1 - 29, we obtained shrimp samples and corresponding captain interviews for catch information from a total of 46 draggers (39 different draggers) and 3 trappers at 14 dealer locations ranging from Portsmouth, NH to Winter Harbor, Maine. The lengths of the sampled vessels ranged from 29' - 77', and the samples came from 29 different fishing grounds.

Vessels were sampled at the following 14 dealers: Portsmouth, NH Co-op; Preble Fish Co., Kennebunkport Pier; Portland Fish Exchange; Resource Trading Co., Portland; Cundys Harbor Wharf; Seahorse Fisheries, Phippsburg; Robinson's Wharf, Southport; Wotton's Lobster, Boothbay Harbor; Osier's Seafood, South Bristol; Mike Farrin's Wharf, South Bristol; Pemaquid Fisherman's Co-op; Thorbjornson's Wharf, Port Clyde; Beal's Lobster Pier, Southwest Harbor and the Winter Harbor Co-op.

Daily catches for the 46 draggers sampled ranged from 48 - 5,900 lbs, the average daily catch was 1,900.5 lbs, the range of catches in lbs/hr drag time (CPUE) was 21.3 - 655.5, while the average CPUE was 245.4 lbs/hr. (During February, 1999 daily catches for 37 draggers sampled at 7 dealer locations from Kennebunkport to Port Clyde ranged from 239 - 4,665 lbs, the average daily catch was 1,473.6 lbs, the range of catches in lbs/hr drag time (CPUE) was 26.6 - 491.0, while the average CPUE was 167.6 lbs/hr).

For the 3 trappers sampled at 2 dealers, the 294 traps that were hauled yielded 3,147 lbs for an average of 10.7 lbs/trap. (In February of 1999, 12 trappers sampled at 3 dealers had hauled 1,532 traps that yielded 12,878 lbs, for an average of 8.4 lbs/trap).

Many of the fishermen we have encountered this season have stated that they would like to see a days-at-sea program adopted for the Northeast shrimp fishery so they can choose the days they will fish without feeling compelled to go out when foul weather presents a hazard to life and vessel, or when their gear is in less than optimal condition.

ACA annual report 2000 Figure 3

Commercial Shrimp Port Sampling. Monthly Report for March, 2000 (days 39 - 51 of the 51 day season).

Decreasing shrimp catches by draggers from most ports marked the last 13 days of the season between March 1 - 15, 2000 but this is not unusual for March, as the shrimp migrate to offshore grounds. Average daily catches and average CPUE's (lbs/hr drag time) were half that for draggers sampled in February, 2000. Boat prices varied between $.65 - $1.20/lb, depending on the dealer and quality of the shrimp. By the end of the first week shrimp landed in the southern Maine area were becoming soft with a lot of small males mixed in, which reduced the boat price. As a result, some of the larger draggers changed over to ground fishing. However, shrimp being landed at dealers in Southwest Harbor and Winter Harbor were of good count (estimated 39-40 count) and of excellent quality with only a few males in the catch. A Winter Harbor shrimper was disappointed that the season was ending on March 15, because he said the best shrimping for Winter Harbor boats always occurs during the last two weeks in March. Shrimp trappers in mid-coast Maine continued to bring in good catches of excellent quality shrimp.

In March, we obtained samples and corresponding captain interviews for catch information from 17 draggers and 11 trappers at 10 dealer locations from Portsmouth, NH to Southwest Harbor, Maine. The lengths of the sampled vessels ranged from 30' - 82' and the samples came from 23 different fishing grounds.

Daily catches for the 17 draggers sampled at 7 dealer locations ranged from 165 - 2775 lbs, the average daily catch was 915.2 lbs, the range of catches in lbs/hr drag time (CPUE) was 41.7 - 338.5, while the average CPUE was 121.8 lbs/hr. (This compares with an average daily catch of 1106.9 lbs and an average CPUE of 127.0 lbs/hr for 29 draggers sampled at 8 dealer locations from Portland to Winter Harbor, Maine in March, 1999). Individual catches for the 11 trappers sampled at 4 dealer locations ranged from 3.9 - 16.7 lbs/trap. They had hauled a total of 1515 traps for an average catch of 9.6 lbs/trap. Shrimp are being processed in the laboratory in order to provide information on the size and age composition of the catch from different fishing grounds.

Draggers were sampled at the following 7 dealers: Beal's Lobster Pier, Southwest Harbor; Thorbjornson's Wharf, Port Clyde; Eugley's Wharf, South Bristol; Wotton's Lobster, Boothbay Harbor; Resource Trading Co., Portland; Portland Fish Exchange and the Portsmouth, NH Co-op.

Trappers were sampled at the following 4 locations: Friendship; New Harbor Co-op; South Bristol Co-op and Eugley's Wharf, South Bristol.

The best shrimping along the Maine coast this year has occurred from Boothbay Harbor to Portsmouth, NH. Port Clyde fishermen report that they never did get the big catches that they have been accustomed to in past years, and several of their boats went to Portland to fish. Boats from a dealer in Southwest Harbor also went to Portland.

We continued to receive comments from shrimpers in March relative to the shortened season and that they would like to see a days-at-sea program for the fishery next season.

ACA annual report Table 1

Commercial Shrimp Port Sampling January 17 - March 15, 2000

			Boats												
	# Dealers Visited & Locations *1	# Samples Collected	# Different Draggers Sampled *2	# Trappers Sampled	Length Range (ft)	# Fishing Grounds	Total catch in (lbs) Draggers	Trappers	Dragger Boat Days	Draggers Av. Catch Per Day (lbs)	Total Hrs. Drag Time	Lbs./Hr Drag Time	Total # Traps Hauled	Total Set Over Days	Average Lbs./trap
Jan. 2000	7 Portland to New Harbor	28	23	5	35' - 87'	18	75,143	8,987	23	3,267.10	161.08	466.5	758	20	11.9
Feb. 2000	14 Portsmouth to Winter Harbor	49	39	3	29' - 77'	29	87,424	3,147	46	1,900.50	356.17	245.4	294	7.5	10.7
Mar. 2000	10 Portsmouth to Southwest Harbor	28	17	11	30' - 82'	23	15,558	14,494	17	915.2	127.77	121.8	1,515	47	9.6
Season Totals:	19 different dealers Portsmouth, NH to Winter Harbor, ME	105	61 different draggers	15 different trappers	29' - 87'	58 different fishing grounds	178,125	26,628	86	2,071.20	645.02	276.1	2,567	74.5	10.4

*1 Dealers visited more than one time in any given month are only counted once.
Sampling is also conducted at the Portsmouth, N.H. Fishermen's Co-op due to the fact that some Maine shrimp boats land their catches at that facility.

*2 Some vessels may be sampled more than once in a given month. Hence the number of samples collected may exceed the number of different vessels sampled.

ACA annual report Table 2

Commercial Shrimp Port Sampling

A list of 19 shrimp dealers where 105 shrimp samples were obtained from January 17, 2000 (1st day of shrimp season) – March 15, 2000 (last day of shrimp season) with the total visits to each dealer, the number of samples obtained at each visit (number of boats sampled) and the total number of samples obtained at each dealer.

Dealer	No. Visits	Samples collected/visit	Total Samples
1. Wotton's Lobster, Boothbay Harbor	5	2,3,2,3,4	14
2. Osier's Wharf, South Bristol	2	5,3	8
3. Resource Trading Co., Portland	3	2,5,3	10
4. Shaw's Wharf, New Harbor	1	4	4
5. South Bristol Co-op, South Bristol	2	7,8	15
6. Cundys Harbor Wharf, Cundys Harbor	2	6,2	8
7. Portland Fish Exchange, Portland	3	2,5,1	8
8. Robinson's Wharf, Southport	1	2	2
9. Beal's Lobster Pier, Southwest Harbor	2	3,2	5
10. Mike Farrin's Wharf, South Bristol	1	2	2
11. Winter Harbor Co-op, Winter Harbor	1	3	3
12. Pemaquid Fishermen's Co-op, Pemaquid	1	1	1
13. Kennebunkport Pier, Kennebunkport	2	3,3	6
14. Seahorse Fisheries, Phippsburg	1	1	1
15. Thorbjornson's Wharf, Port Clyde	2	5,3	8
16. Portsmouth Fishermen's Co-op, Portsmouth, NH	2	3,3	6
17. Friendship	1	1	1
18. New Harbor Co-op, New Harbor	1	1	1
19. Eugley's Wharf, South Bristol	1	2	2
Totals	**34**		**105**