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**The Commercial Saltwater Fishermen
in New Hampshire**

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Credits for the strength of this study are clearly shared. Responsibility for its shortcomings rests solely with the authors.

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Introduction

The Magnuson Fishery Conservation and Management Act of 1976 was designed to protect groundfish such as cod, haddock and flounder from the fishing pressure of large foreign fleets. A decade and a half later, New England's groundfish stocks are once again in a crisis situation.* Stocks of groundfish are at an all time low. Revenues from New England trawlers are at their lowest point since the 1970's when the Magnuson Act was being framed. Consumers are paying more for groundfish because of the low supply.

In recognition of this situation, the proposed New England Groundfish Restoration Act calls for conservation and management measures designed to double the size of groundfish stocks within 5 years. To achieve this objective, a number of specific actions have been proposed; for example:

- 1) fishing effort controls, such as a moratorium or limited access,
- 2) species specific quotas and trip limits,
- 3) emergency procedures for quickly closing (within 5 days) fishing grounds where fish are spawning or where there is an abundance of small fish,
- 4) a government sponsored vessel purchase program to reduce the number of vessels in the fishery.
- 5) bag limits, fishing seasons and conservation measures for recreational fishermen

If passed into law, the Groundfish Restoration Act would have a dramatic impact on the domestic fleet. This paper summarizes the findings from a survey of commercial fishermen in New Hampshire to determine their reactions to the proposed legislation. More specifically, the objectives of the study were to:

- 1) describe the population of New Hampshire's commercial fishing industry,
- 2) assess commercial fishermen's perceptions of fishing quality and the impact of current and proposed management practices (e.g., catch limits, changes in amount and diversity of supply),
- 3) examine the economic expenditures associated with commercial fishing in New Hampshire.

* Grice, F. (1990). New England groundfish in crisis - again. Massachusetts Offshore Groundfish Task Force. Boston, Massachusetts.

An earlier study (Donnelly, Vaske, Zwick, & Lindsay, 1991),* examined a similar set of objectives for recreational saltwater anglers. To the extent possible, comparisons are made with the findings from this previous investigation.

Methods

Data for this investigation were obtained from a survey mailed to the population of commercial fishermen in New Hampshire. A commercial fisherman was defined as an individual who purchased a commercial license during 1991. For purposes of this study, lobstermen and recreational tuna fishermen were not included.

The names and addresses of potential respondents were obtained from the New Hampshire Fish and Game Department. Each individual in the population was mailed the survey, a postage-paid return envelope, and a cover letter describing the intent of the study. To improve the response rate, a post-card reminder and a follow-up mailing of the questionnaire were sent to non-respondents. Of the 63 possible respondents in the population, 42 completed and returned the questionnaire (response rate = 67%).

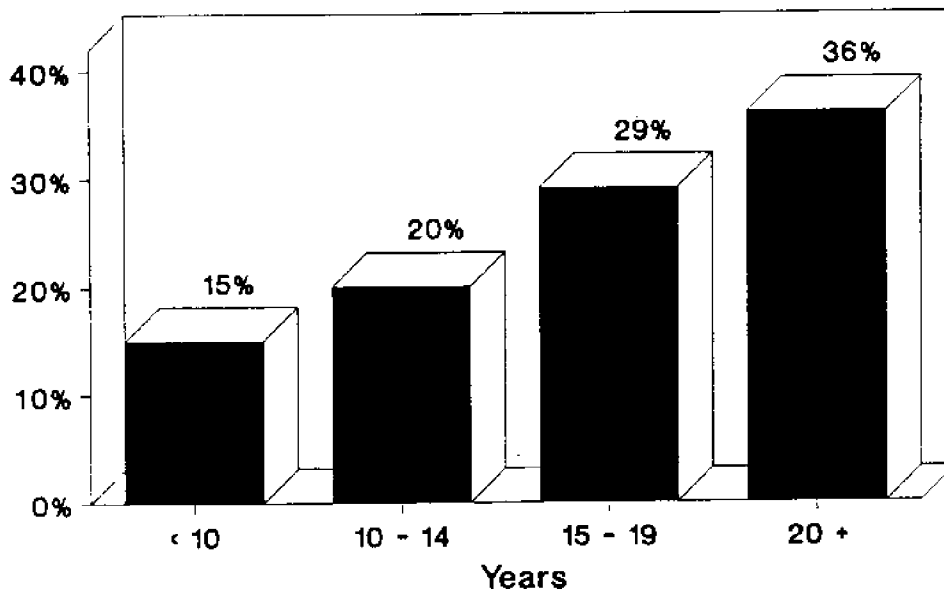
Results

Commercial Fishing Experience

Respondents were experienced commercial fishermen, averaging almost 17 years of experience, and five and a half days of fishing per week. Over a third had fished commercially 20 or more years (Figure 1). Twenty-nine percent reported fishing between 15 to 19 years.

* Donnelly, M.P., Vaske, J.J., Zwick, R., & Lindsay, B. (1992). Sport fishing expenditures and perceptions of fishing quality: An assessment of saltwater fishing in Northern New England. New Hampshire Fish and Game Department, Marine Fisheries Division. Concord, New Hampshire. 47 pp.

Figure 1
Years of Commercial Fishing



Many of these individuals plan to continue commercial fishing for an extended period of time. Nearly two thirds (61%) indicated a desire to fish for 20 or more years (Figure 2). An additional 13 percent said they would fish another 15 to 19 years, and about a quarter plan to pursue their commercial operation for 10 to 14 years. Only 3 percent said they would quit in less than ten years.

Fleet characteristics

Similar to other businesses in New Hampshire, most commercial fishing operations are small (Figure 3), employing only 2 individuals (67%). Another 24% employ 3 or 4 individuals. Over three quarters have only one commercial fishing vessel; 17% have two boats (Figure 4). Most vessels are 40 - 49 feet in length (Figure 5), with an average length of 42 feet. Over two thirds of the boats were purchased between 1980 and 1989 (Figure 6); a majority were built during this same timeframe (Figure 7).

Figure 2
Years Planning to Commercial Fish

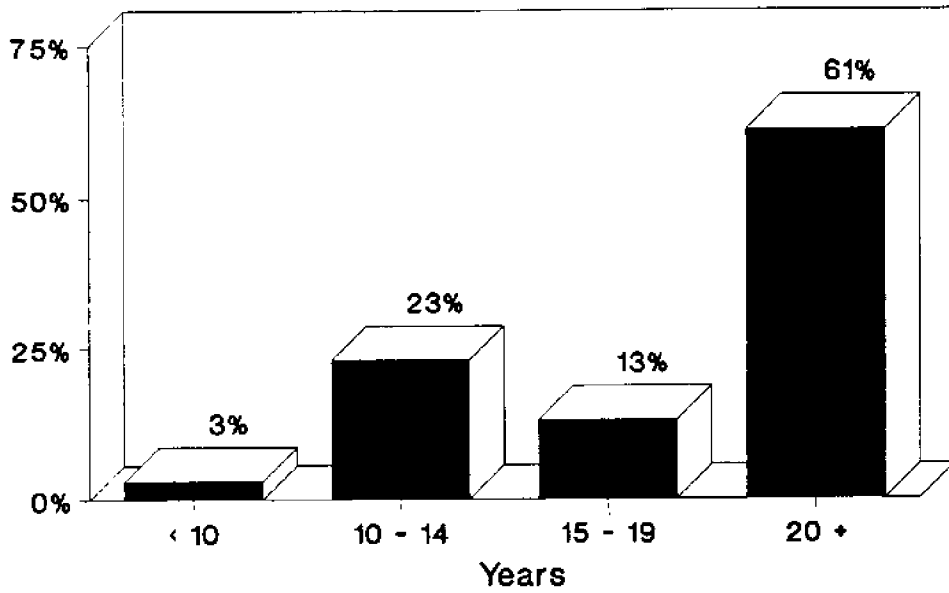


Figure 3
Number of People Employed

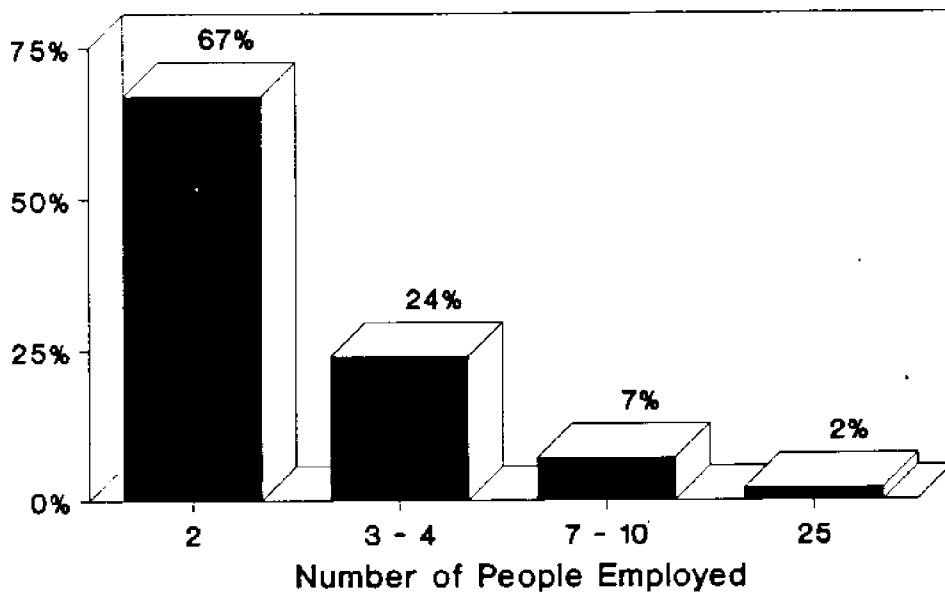


Figure 5
Length of Primary Vessel

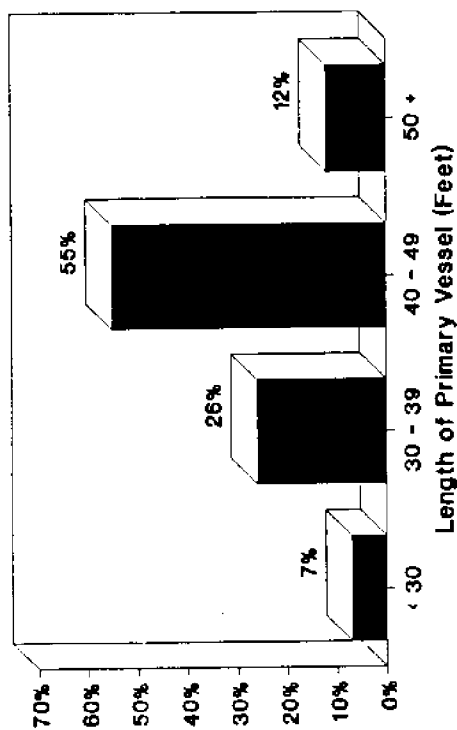


Figure 4
Number of Vessels in Fleet

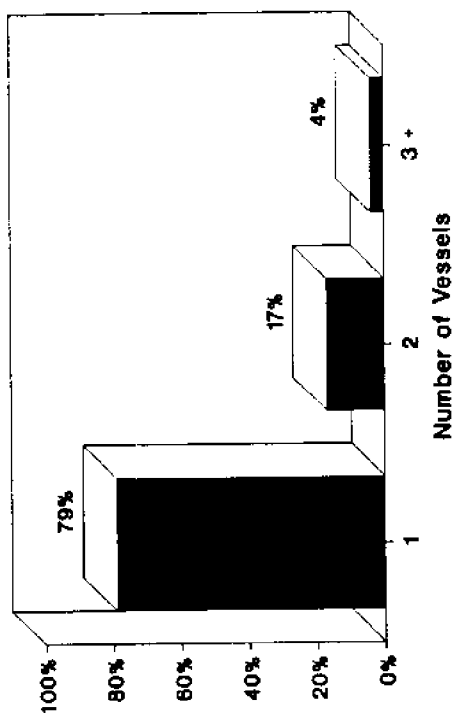


Figure 7
Year Primary Vessel Was Built

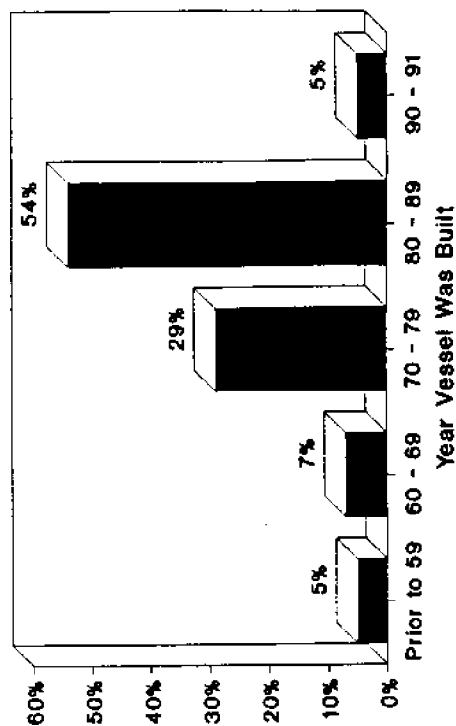
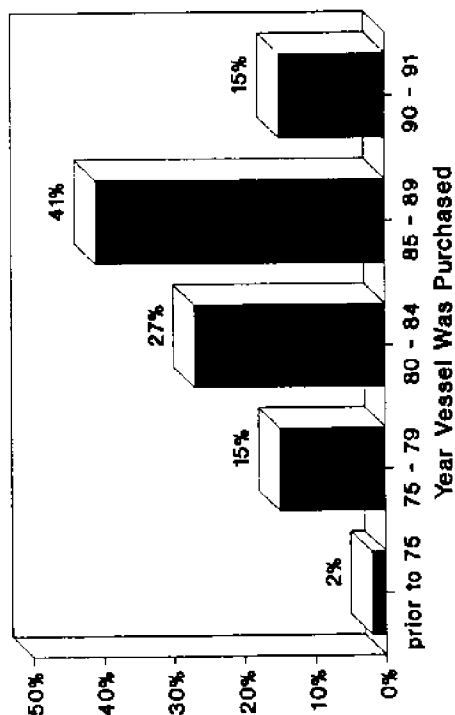


Figure 6
Year Primary Vessel Was Purchased



Fishing Techniques

Almost two thirds of the sample (65%) reported using dragging as a commercial fishing technique, and 48% use gill netting (Figure 8). Only one respondent (2% of the sample) indicated using long lining in commercial fishing. When asked if they would consider using long lining as a technique, 33% of the commercial fishermen responded negatively (Figure 9). A slightly higher percentage (39%), however, would consider using the technique.

Preferred Species and Outlets for Catch

Groundfish (e.g., cod, pollock, flounder) were fished for most often. Seventy-six percent listed groundfish as their first choice, 17% ranked it second, and 2% considered it their third choice (Table 1). Shrimp was the second most fished for species (5% ranked shrimp as their first choice, 43% mentioned it second, and 14% listed it third). The third most popular commercial species was tuna (2% ranked it as the most fished for species, 24% ranked it as second, and 38% rated tuna as the third most popular species). Whiting and Herring were ranked the least popular species by the commercial fishermen. The fishermen sell their catch at a variety of outlets, although the Portsmouth Fish Coop is used by two thirds of the respondents (Table 2).

Table 1. Preferred catch

Species	1st Choice	2nd Choice	3rd Choice	Not in Top 3
Groundfish	76%	17%	2%	5%
Shrimp	5	43	14	38
Tuna	2	24	38	36
Mackerel	2	0	5	93
Whiting	0	2	0	98
Herring	0	0	2	98

Figure 8
Types of Commercial Fishing

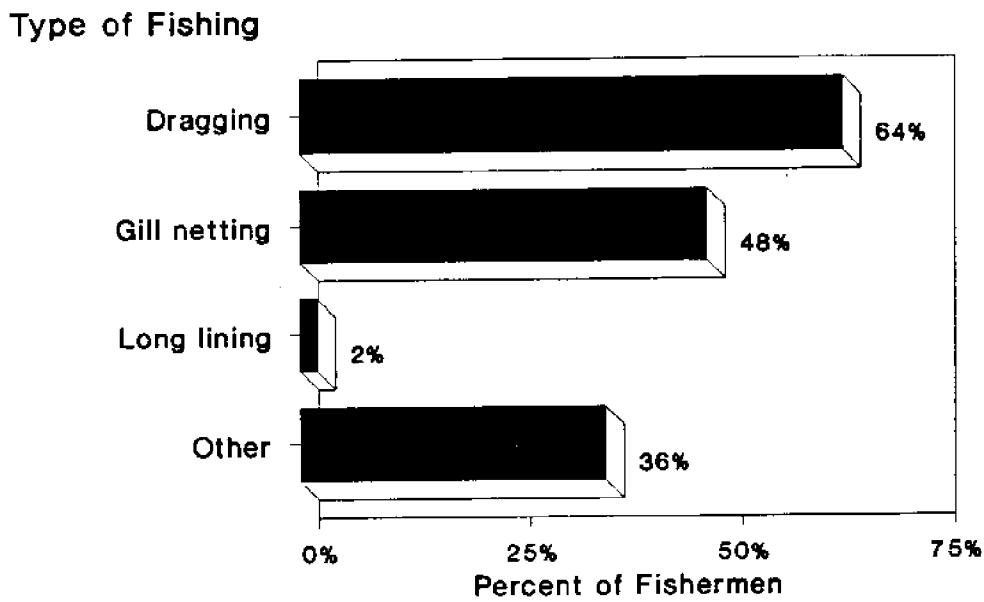


Figure 9
Consider Using Long Lining?

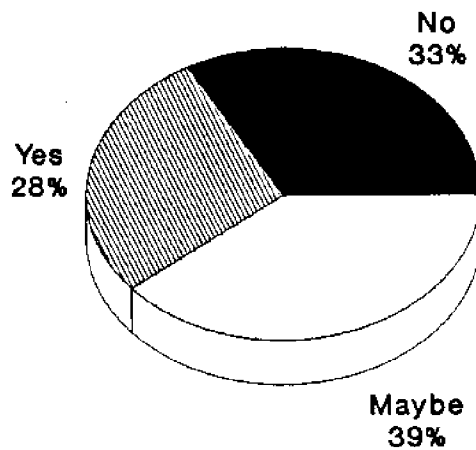


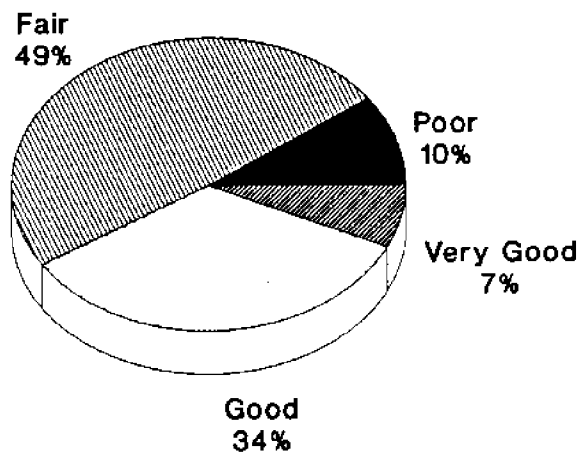
Table 2. Preferred outlets for selling catch

Outlet	Number	Percent
Portsmouth Fish Coop	24	65%
Tri-coastal Seafood	6	16
Yankee Fishermen Coop	2	5
Seabrook	1	3
Maine Lobster Outlet	1	3
Portland Fish Exchange	1	3
New Hampshire Dealers	1	3
Anywhere	1	3

Beliefs About the Quality of Commercial Fishing

Nearly half (49%) rated the quality of commercial fishing in the Gulf of Maine as only fair, and 10% considered it poor (Figure 10). A third ranked the fishing as good; 7% said very good.

Figure 10
Quality of Fishing in the Gulf of Maine



The survey respondents believe the number of saltwater fish has declined since they started commercial fishing (78%), but still think there are enough fish for both recreational and commercial fishermen (78%) (Table 3). Two thirds felt that over harvesting by commercial fishermen was the main reason for reduced fishing quality. Other reasons for reduced quality included environmental problems such as agricultural run-off and sewage discharge (50%), over fishing by recreational anglers (46%), and regulations protecting dolphins and porpoises (28%).

Although commercial fishermen do not believe the New England Groundfish Restoration Act will achieve the goal of doubling the groundfish stocks within 5 years (only 25% agreed with this statement), 70% of the sample felt stricter conservation measures are necessary if fish stocks are to increase (Table 3). Sixty percent would be willing to reduce their fishing effort to achieve this goal, and a similar percentage (61%) believe bag limits on recreational fishermen would be an effective way of increasing the fish populations. Overall, only about a quarter (29%) think the New England Fisheries Management Council has been an effective agency.

It is often assumed that conflicts exist between commercial and recreational fishermen. Although 58% of the commercial fishermen felt that recreational anglers cause problems for people who make their living fishing, conflicts between different types of commercial fishermen evoked stronger emotions. Ninety percent of our sample indicated dragnets cause problems for gill netters. The reverse, however, was not as apparent; less than half (45%) believed gill netters cause problems for dragnets. Lack of access due to increased development was a basis of concern for over two thirds of the commercial individuals.

A recreational saltwater fishing license is a controversial issue among individuals who fish for pleasure. In our earlier study (Donnelly, et al. 1992), just under a third of the New Hampshire sample (31%) supported a license as a way of maintaining management programs, and about half (56%) believed the money from

Table 3. Beliefs about Commercial Fishing

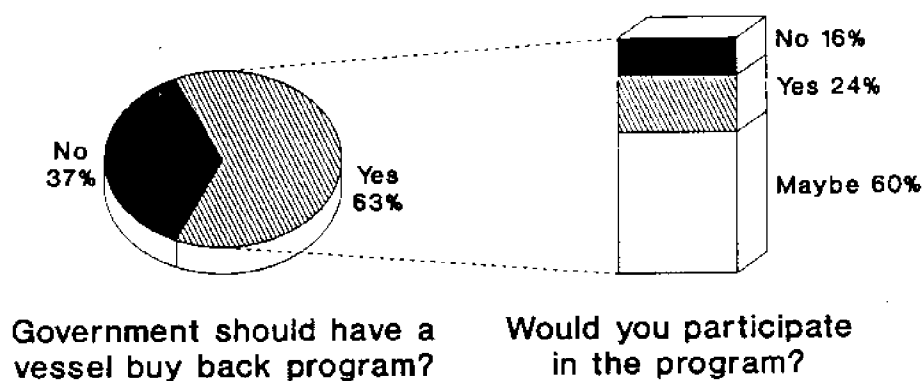
Belief Statement	Percent Agreeing
Beliefs About the Status of the Fish Stocks	
The number of saltwater fish has declined since I started fishing	78%
There are enough fish for both recreational and commercial fisherman	78
Reasons For Reduced Fishing Quality	
Environmental problems such as agricultural runoff and sewage discharge are the main reason for poor commercial fishing	50%
Over harvesting by <i>commercial fishermen</i> is a main reason for poor commercial fishing	66
Over fishing by <i>recreational fishermen</i> is the main reason for poor commercial fishing	46
Regulations protecting dolphins and porpoises have hurt commercial fishing	28
Effectiveness of Management Programs	
Doubling the size of groundfish stocks within 5 years, as called for in the New England Groundfish Restoration Act of 1991, is a realistic goal	25%
Stricter conservation measures are necessary to increase fish stocks	70
I would be willing to reduce my fishing effort to increase fish stocks	60
Bag limits for recreational fishermen would be an effective way to increase fish stocks	61
A vessel buy back program funded by diesel fuel taxes would be an effective way of reducing commercial fishing and increasing fish stocks	38
The New England Fisheries Management Council has been an effective agency	29
Beliefs About Conflict	
Increased development along the coast has reduced access for commercial fishermen	69%
Some commercial fishermen who use gill nets cause problems for druggers	45
Some commercial fishermen who are druggers cause problems for gill netters	90
Recreational fishermen cause problems for commercial fishermen	58
Beliefs About Recreational Fishing Licences	
Recreational saltwater fishermen should be required to buy a license to support management programs	81%
Recreational fishing along the coast has always been free and should remain so	24
A recreational saltwater fishing license would be a fair way to pay for the restoration of fishing stocks	66

a license could help to restore the stocks. Nearly three quarters of the recreational anglers felt that fishing along the coast has always been free and should remain so. As might be expected, the beliefs of commercial fishermen on these issues differ considerably. Eighty-one percent of the commercial fishermen supported a recreational saltwater fishing license, and two thirds believed a license would be a fair way to pay for the restoration of fishing stocks (Table 3). Less than a quarter felt that recreation should remain free because of tradition.

Support for Federal and State Management Strategies

Slightly more than a third (38%) favored a vessel buy back program as a strategy for reducing commercial fishing and increasing the stocks (Table 3). Nearly two thirds (63%), however, think the government should have a vessel buy back program (Figure 11). Of these, 24% said they would definitely participate in such a program, and another 60% might be willing to participate.

Figure 11
Beliefs About Vessel Buy Back Program



The commercial fishermen in this sample supported setting minimum size limits on fish (90%), placing a moratorium on new licenses (83%), limiting entry (78%), requiring a larger mesh size (67%), and prohibiting the use of certain types of fishing gear (57%) (Table 4). Less support was evident for closing certain areas to fishing (48%), harvest moratoriums on certain species which are at low levels (43%), and setting quotas on the number of certain species which can be caught (34%). Nearly four fifths thought that stricter enforcement of existing measures was all that is needed to improve fish stocks.

Table 4. Evaluation of Commercial Saltwater Fisheries Management Programs

Management Strategy	Percent Supporting
Setting minimum size limits on fish	90%
Placing a moratorium on new licences	83
Limiting entry	78
Requiring a larger mesh size	67
Prohibiting the use of certain types of fishing gear	66
Closing fishing areas during part of the year (closed season)	57
Closing certain areas to fishing	48
Placing a harvest moratorium on certain species which are at low levels	43
Setting quotas on the number of certain species that can be caught	34
Only need stricter enforcement of existing measures	79

Commercial Fishing Expenditures

The commercial fishing sample spent a total of \$1,835,626 during 1991 (Table 5). The highest expenditures were for boat fuel (\$474,042), nets (\$349,937), and vessel maintenance (\$261,046). A high proportion of the expenses for fuel for vessels (94%), berthing fees (86%), lines and hooks (71%), repair of fishing gear (70%), and vessel maintenance (70%) was spent along the New Hampshire coastline. For electronic equipment (87%), engines (65%), vessel storage (62%), and safety equipment (60%), the highest proportion of the expenditures were out of state. Few expenditures were made in inland New Hampshire.

Table 5. 1991 commercial fishing expenses¹

Type of Expense	Amount Spent in 1991	Average Amount Spent	Where Item Was Usually Bought		
			NH Coast	NH Inland	Out of State
Engines	\$147,495	\$3,881	35%	0%	65%
Hydraulics	\$29,600	\$779	63	8	29
Electronic Equipment	\$91,050	\$2,461	9	4	87
Safety Equipment	\$76,100	\$2,057	34	6	60
Nets	\$349,937	\$9,458	36	19	45
Lines and Hooks	\$8,300	\$224	71	0	29
Fuel for Vessel(s)	\$474,042	\$12,812	94	0	6
Berthing Fees	\$27,139	\$733	86	3	11
Vessel Storage	\$16,250	\$428	38	0	62
Vessel Maintenance	\$261,046	\$7,055	70	0	30
Vessel Registration(s)	\$4,240	\$114	65	31	4
Vessel Insurance(s)	\$164,755	\$4,453	35	24	41
Repair of Fishing Gear	\$104,800	\$2,832	70	4	26
Other Marine Equipment	\$80,872	\$2,186	52	10	38
Total Expenditures	\$1,835,626				

1. Sample size = 42

Estimated Commercial Fishing Population Expenditures

The expenditures for the total New Hampshire commercial fishing population were calculated by multiplying the total population of commercial fishermen in New Hampshire (N = 63)** by the percent of our sample who spent money on each item by the average amount spent for each item. To determine the in-state expenditures, the estimated dollar amounts for the total population were weighted by the percentage which was spent in New Hampshire.

The estimated total population expenditures (both in New Hampshire and out of state) for 1991 were \$2,749,195. Fuel for the vessels (\$710,297), nets (\$524,352), and vessel maintenance (\$391,129) accounted for 59% of all expenditures (Table 6).

Of the total population estimate (\$2,749,195), \$1,873,160 (68%) was spent in New Hampshire. Over half (54%) of the in-state expenditures went for vessel fuel (\$667,679) and vessel maintenance (\$348,105).

Respondent Characteristics

Almost all of the respondents (95%) live within 10 miles of the coast, and over two thirds (69%) live within 2 miles of the coast (Figure 12). Two fifths were in the 40 to 49 age category, and 32% were in the 30 to 39 age range (Figure 13). The average age was 40. Only 2% was 60 or older. Ninety-five percent of the sample had at least a high school education; almost a third (31%) had a college degree (Figure 14). About two thirds (65%) of the 35 respondents to the income question reported incomes in excess of \$50,000 (Figure 15). Over a third (34%) of the respondents had total gross incomes exceeding \$100,000.

** For purposes of this study, lobstermen and recreational tuna fishermen were not included in the population estimate.

Table 6. Estimated commercial fishing expenditures

Type of Expenditure	Average Amount Spent in 1991 Per Respondent	Percent of Sample Spending Money	% Spent in New Hampshire	Total ¹ New Hampshire Expenditures	Total ² Expenditures
Engines	\$3,881	90	35	\$77,018	\$220,053
Hydraulics	\$779	90	71	\$31,360	\$44,169
Electronic Equipment	\$2,461	88	13	\$17,737	\$136,438
Safety Equipment	\$2,057	88	40	\$45,616	\$114,040
Nets	\$9,458	88	55	\$288,393	\$524,352
Lines and Hooks	\$224	88	71	\$8,817	\$12,419
Fuel for Vessel(s)	\$12,812	88	94	\$667,679	\$710,297
Berthing Fees	\$733	88	89	\$36,167	\$40,638
Vessel Storage	\$428	90	38	\$9,222	\$24,268
Vessel Maintenance	\$7,055	88	70	\$348,105	\$391,129
Vessel Registration(s)	\$114	88	96	\$6,067	\$6,320
Vessel Insurance(s)	\$4,453	88	59	\$145,656	\$246,874
Repair of Fishing Gear	\$2,832	88	74	\$116,184	\$157,006
Other Marine Equipment	\$2,186	88	62	\$75,139	\$121,192
Total Expenditures				\$1,873,160	\$2,749,195

1 The total New Hampshire expenditures were calculated by multiplying the New Hampshire commercial fishing population (N = 63) X the percentage of our sample who spent money on each item X the average spent on each item X the percentage that was spent in New Hampshire.

2 The total expenditures (both within and outside of New Hampshire) were calculated by multiplying the New Hampshire commercial fishing population (N = 63) X the percentage of our sample who spent money on each item X the average spent on each item.

Figure 13
Age of Respondents

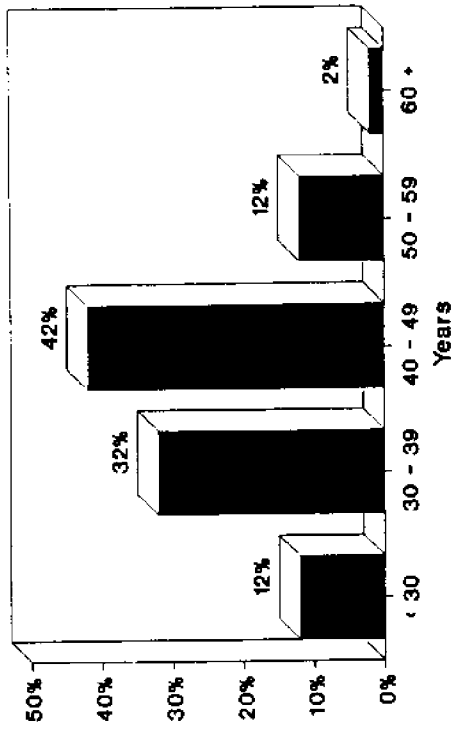


Figure 15
Income of Respondents

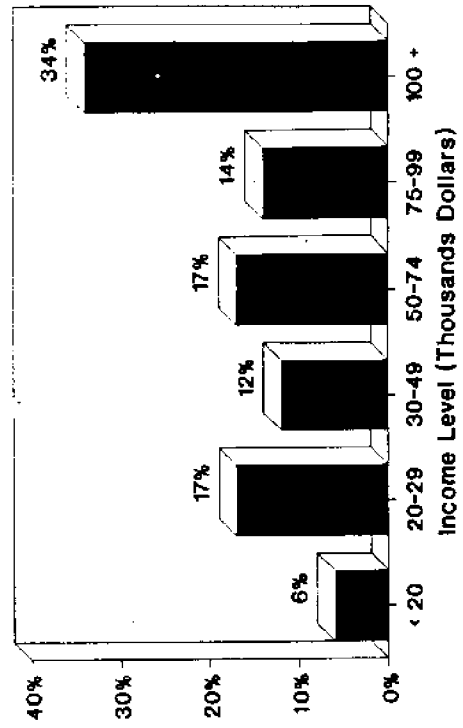


Figure 12
Distance Respondents Live From Coast

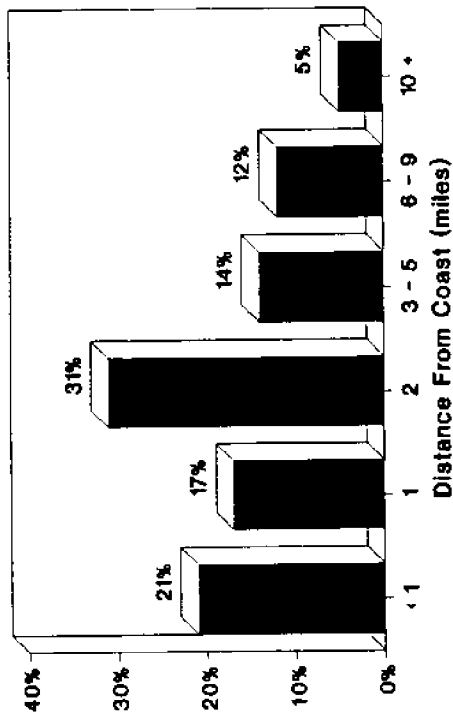
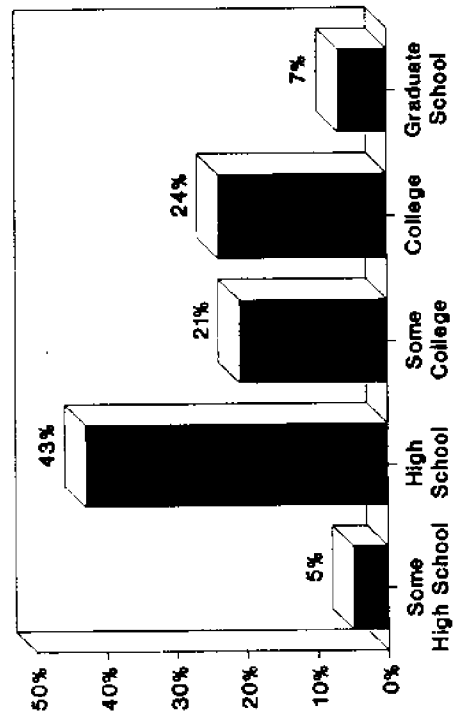


Figure 14
Education Level of Respondents



Discussion

Commercial fishermen are cognizant of the declines in fish stocks, and admit that over harvesting by commercial fishermen has contributed to the current situation. Most of the fishermen favored stricter conservation measures, and were willing to reduce their effort to increase fish populations. They do not, however, perceive the goal of doubling groundfish stocks within 5 years as set forth in the proposed New England Groundfish Restoration Act as realistic. This reaction can partially be attributed to the fishermen's perception of the New England Fisheries Management Council. Only about a quarter of the respondents believed the agency is effective.

Policy Implications

Responses to the survey provide an indication of the types of conservation measures that are likely to be supported by the commercial fishermen. For example, the fishermen supported the following strategies:

- 1) setting minimum size limits on fish,
- 2) placing a moratorium on new licenses,
- 3) limiting entry,
- 4) requiring a larger mesh size,
- 5) prohibiting the use of certain types of fishing gear,
- 6) stricter enforcement of existing measures.

Less support was evident for:

- 1) closing certain areas to fishing,
- 2) harvest moratoriums on certain species which are at low levels,
- 3) setting quotas on the number of certain species which can be caught.

Some of the commercial fisherman saw a vessel buy back program as one strategy for reducing fishing effort and increasing fish stocks, and most think the

government should have such a program. However, given that three quarters were either not willing to participate or were undecided about their participation, and that most plan to continue commercial fishing for an extended period of time, the actual effectiveness of a government sponsored vessel purchase program is questionable at best.

As might be expected, bag limits on recreational anglers to improve fish stocks, and a recreational saltwater license to support management programs, were viewed favorably by the commercial fishermen.

Commercial Fishing Expenditures

By design, the survey excluded lobstermen and recreational tuna fishermen. The study was limited to the 63 fishermen who purchased a commercial license during 1991. Although this population of interest is relatively small in numbers, their total expenditures were quite substantial. We estimated that the population spent 2.75 million dollars on commercial fishing related items during 1991. Of this total, 68% of the money was spent in New Hampshire.

Summary

This investigation has attempted to provide some insight on the commercial fishermen's views about the proposed New England Groundfish Restoration Act. Although the Act's goal of doubling fish stocks in 5 years was not seen as realistic, there is a recognition among the fishermen that some action must be taken to protect the resource and ensure their future in the business. By highlighting the types of conservation measures fishermen are willing to accept, and noting the economic importance of the industry to the state, our intent was to provide another component to the overall management strategy of a fragile resource.