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B763: The Perceptions, Attitudes, and Reactions of Maine Commercial Fishermen Regarding Extended Jurisdiction and Fishery Management Practices

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THE PERCEPTIONS, ATTITUDES, AND
REACTIONS OF MAINE COMMERCIAL
FISHERMEN REGARDING EXTENDED
JURISDICTION AND FISHERY
MANAGEMENT PRACTICES

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Edward J. Johnson and William C. Dunbar

INTRODUCTION

The objective of the Fisheries Conservation and Management Act of 1976 (P.L. 94-229) is to provide for the conservation and management of the Nation's fisheries resources.

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CONCLUSIONS

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THE PERCEPTIONS, ATTITUDES, AND REACTIONS OF MAINE COMMERCIAL FISHERMEN REGARDING EXTENDED JURISDICTION AND FISHERY MANAGEMENT PRACTICES

Elizabeth Ferguson and Wallace C. Dunham¹

INTRODUCTION

The enactment of the Fisheries Conservation and Management Act of 1976 (FCMA) on March 1, 1977 marked the beginning of a new era for the fishing industry of the United States. This act, commonly referred to as the "200 mile limit", has the potential of bringing about important institutional changes in the fishing industry. The legislation was necessitated by increased fishing pressure from both United States and foreign vessels, and the apparent inadequacy of existing fishery management practices and controls. The FCMA provides a framework of regulations which has the scope and flexibility needed to make wise decisions regarding our fishery resources. But if the potential significance of this act is to be fulfilled, careful analysis of the effects and implications of its policies must be made.

The fish off the coasts of the United States represent an extremely valuable natural resource which is renewable, but finite. They are an important source of food and protein, provide recreational opportunities, and constitute the economic base upon which many coastal communities depend; but increased fishing effort and ineffective management practices have resulted in the overfishing of some species to the extent that their survival is endangered, while other stocks are being reduced to this level.

Another problem has been the presence of foreign fishing fleets, which became prevalent off the coast of New England in the early 1960s when they were attracted by the productive waters of the Northwest Atlantic. These large, sophisticated, and well-equipped vessels are capable of staying at sea for weeks at a time and often have processing and canning operations right on board. In contrast, the United State's fishing fleet is composed primarily of small, older vessels, many of which are rarely capable of trips longer than a day or two. These fleets of foreign vessels have interfered with domestic fishing

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operations and caused damage to U.S. fishing gear. In the coastal area of the Northwest Atlantic, which provides most of New England's catch, the United State's portion of the total harvest dropped from 98 percent in 1965 to 32 percent in 1970.² It is also believed that intensive methods of harvesting used by foreign fleets have added to the depletion of many fish stocks.

There are five main purposes behind the Fisheries Conservation and Management Act of 1976. Foremost, it was the intention of the act to take immediate action toward the conservation of the fishery resources by establishing authority in two areas. The first area is a fishery conservation zone in which the United States has exclusive fishery management authority over all species except those that are highly migratory. This zone extends outward from the United States for 200 nautical miles. The second area of authority is exclusive management rights over all U.S. anadromous species and continental shelf fisheries, with the continental shelf being defined as the seabed of the submarine areas adjacent to the coast but outside the 200 mile fishery conservation zone, to a depth of 200 meters.³

The second major purpose of the FCMA is to provide support in the implementation of international fishery agreements regarding the management of highly migratory species. Furthermore, this legislation is intended to promote "sound conservation practices" in both commercial and recreational fishing. Fourthly, it calls for the development and implementation, according to specified national standards, of fishery management plans which will strive to maintain the optimum yield from each fishery.⁴ This optimum is defined according to the maximum sustainable yield and then modified by any relevant ecological, economic, or social factor.⁵

The final purpose of this act is to establish Regional Fishery Management Councils which are responsible for preparing the management plans. The development of these plans is to include input and advice from the fishing industry, consumer groups, environmental

² Anonymous, C. E. MaGuire, Inc., *Coastal Policy Study: Towards a Fisheries Development Strategy for Maine*, (Maine: Maine Department of Marine Resources, 1978), p. 2.

³ Anadromous species are those which spawn in fresh or estuarine waters of the United States and migrate to coastal waters.

⁴ A fishery is a stock of fish considered as a single unit on the basis of various factors, such as geographic, scientific, and economic factors.

⁵ Maximum sustainable yield is the maximum annual yield of fish that can be taken from a stock without leading to lower yields in the future.

organizations, and any other interested parties. Furthermore, these plans are to take into consideration the social and economic needs of the region.

With these regulations and guidelines the Fisheries Conservation and Management Act of 1976 hopes to provide efficient management of the United State's fishery resources in order to insure their conservation and continued role as a food source and as an economic base for coastal communities.

THE PROBLEM

The fishing industry is a vital sector of Maine's economy and with the passage of the Fisheries Conservation and Management Act of 1976 there is a framework of regulations established which may be capable of providing the management needed for the fishery resources on which Maine's fishing industry depends. The FCMA has the potential to revive the State's fishing industry. If this fisheries management plan is effective, it could result in increased fish yields, which has implications for the harvesting sector, and also for the onshore processing and marketing sectors. Increased investments in these areas could significantly affect coastal communities which depend on the fishing industry. But in order for the potential significance of this legislation to be realized, there is a need for careful analysis of the effects and implications of its policies and regulations.

It is the individual Maine fisherman who is presently feeling the initial direct impact of the FCMA and its regulations. The fishermen now have a greater expanse of ocean in which foreign vessels are restricted. They must limit their catches to prescribed quotas and follow regulations regarding closed seasons and closed areas, or risk fines. In order for many Maine fishermen to take advantage of the entire area of the 200 mile zone they may need to consider changing from the traditional small, family owned vessels to larger, more sophisticated vessels capable of negotiating the far offshore areas. Thus it is important to understand the perceptions and evaluations of Maine commercial fishermen regarding the FCMA, as they are present at the actual working level of this plan, and can see how the regulations and policies are carried out. The Maine fishermen should thus provide valuable insight in the application, impact, and effectiveness of the Fisheries Conservation and Management Act of 1976.

The main objective of the study reported here was to determine the perceptions, attitudes, and reactions of Maine commercial fishermen regarding extended jurisdiction and fishery management practices.

PROCEDURE

A mail questionnaire was utilized to obtain data concerning the attitudes and reactions of Maine commercial fishermen regarding extended jurisdiction and fishery management practices. It was sent to a randomly selected sample of full-time fishermen. Only full-time fishermen who own or operate vessels were selected because they are the ones most affected by the FCMA and are also in the best position to react to it. Part-time fishermen and crew members, on the other hand, would not be in a position to make their own decision on reaction to the new legislation, but would be part of the skipper's decision. Furthermore, this also eliminated the duplication inherent in having more than one member of a vessel's crew respond. A total of 251 usable questionnaires was returned for an overall response rate of 25 percent.

Two different statistical tests, chi-square and analysis of variance, were used to study the relationships between the variables. Chi-square was used in conjunction with contingency tables, a frequency distribution of the observations into cells by pairs of variables. Chi-square analyzed the distribution of the variables to determine whether a significant relationship existed between them.

Analysis of variance calculated whether the means of the subsamples into which the data were grouped were significantly different from one another. If there was no significant difference it could be assumed that any deviations were due to sampling error, though the presence of a significant difference implied that the subpopulations were, in fact, different.

There are a number of limitations which should be considered when evaluating the survey results. The perceptions, attitudes, and reactions of those who responded to the survey may differ from those who did not answer. Furthermore, a respondent's answer may not always accurately reflect his real intentions.

SURVEY RESULTS

Introduction

Six major variables encompassing the attitudes and reactions of the fishermen to fishery management practices and extended jurisdiction were examined for linear dependency with each other and with a number of socioeconomic variables. The six major variables were: 1) whether the respondents feel fishing efforts in Maine need to be regulated, 2) whether the respondents felt the foreign vessels had affected the size of Maine's harvest in recent years, 3) whether the

foreign vessel restrictions imposed as part of the FCMA would affect the size of Maine's harvest in coming years, 4) whether the overall impact of the FCMA would be beneficial or detrimental to Maine commercial fishermen, 5) whether it was thought to be profitable for Maine fishermen to transfer their fishing operations offshore, and 6) how many fishermen actually planned on transferring to offshore areas.

The socioeconomic variables that were analyzed included the number of years the respondent had been employed as a fisherman, along with the current estimated value of the vessel, the type of ownership of the vessel, and the county of home port. Personal information concerning the respondents was also requested, including age, level of education, size of family, gross yearly income from fishing, and gross yearly income for the total family.

Characteristics of Fishermen Responding

There was a wide variety of types of harvesting equipment used among the Maine fleet, with many vessels utilizing more than one type of gear. A large majority of the respondents, 73 percent, indicated they used inshore lobster and crab traps. Also commonly used were scallop dredges (by 41 percent of the respondents), bottom trawls (36 percent), longlines and tub trawls (30 percent), gill nets (26 percent), and offshore lobster and crab traps (21 percent). Also present among the Maine fleet, but utilized more rarely, were midwater trawls, pair trawls, purse seines, weir or stop seines, clam dredges, tuna harpoons, and handlines.

In general, the Maine fleet was composed primarily of smaller vessels, with the largest vessel among the respondents being 76 feet in length (Table 1).

Table 1

LENGTH OF VESSELS OWNED BY MAINE COMMERCIAL FISHERMEN,
MAIL SURVEY, 247 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Length of Vessel (in feet)	Percentage of Vessels
< 25	12
26-35	37
36-45	41
≥ 46	9

The current estimated value of most of the Maine vessels fell in the lower range, with 72 percent valued at less than 32,000 dollars (Table 2).

Table 2
CURRENT ESTIMATED VALUE OF VESSELS OWNED BY MAINE COMMERCIAL
FISHERMEN, MAIL SURVEY, 243 RESPONDENTS,
SEPTEMBER/OCTOBER 1978

Present Value of Vessels (in dollars)	Percentage of Respondents
≤ 5,999	18
6,000 - 11,999	16
12,000 - 31,999	38
32,000 - 64,999	15
65,000 - 99,999	8
≥ 100,000	5

The respondents included representatives with home ports in each of Maine's eight coastal counties, plus two owner/operators who were Maine residents but had home ports in New Hampshire (Table 3).

Table 3
LOCATION OF HOME PORT OF MAINE COMMERCIAL FISHING VESSELS,
MAIL SURVEY, 241 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Location of Home Port (by County)	Percentage of Vessels
York	14
Cumberland	14
Sagadahoc	4
Lincoln	11
Knox	12
Waldo	3
Hancock	32
Washington	9
New Hampshire	1

The respondents were fairly evenly divided according to length of employment (Table 4). Almost all of the respondents, 96 percent, were full-time fishermen, while the remaining four percent classified themselves as part-time fishermen.

Table 4
LENGTH OF EMPLOYMENT AS FISHERMEN, MAIL SURVEY OF
MAINE COMMERCIAL FISHERMEN, 230 RESPONDENTS
SEPTEMBER/OCTOBER 1978

Length of Employment (in years)	Percentage of Respondents
1 - 5	16
6 - 10	21
11 - 20	28
21 - 30	17
> 31	18

In regards to the ownership of the vessels, 88 percent were owned by individuals, 5 percent were owned by partnerships, 2 percent were owned by incorporated individuals, and 5 percent were owned by corporations. Most of the respondents had been the owner/operator of their vessel for a relatively few number of years (Table 5).

Table 5

LENGTH OF TIME AS OWNER/OPERATOR OF PRESENT VESSEL,
MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN
244 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Length of Time as Owner/Operator (in years)	Percentage of Respondents
1 - 5	68
6 - 10	20
11 - 15	7
≥ - 16	5

Most of the respondents harvested more than one species, with 71 percent of the fishermen including lobster in their catch. Other species commonly caught included cod (harvested by 43 percent of the respondents), haddock (37 percent), scallops (36 percent), crabs (33 percent), hake (31 percent), and halibut (31 percent).

Overall, 39 percent of the respondents indicated that the size of their total yearly harvest had increased during their years of fishing, while 56 percent said the size of their harvest had decreased. Those fishermen who said their yearly catch had increased during their years as a fisherman generally indicated that a number of factors were involved. About 54 percent used better harvesting equipment, 40 percent spent more time harvesting, 39 percent felt natural cycles were a factor, and 34 percent believed there were more fish available for harvesting. Among those fishermen whose catches had decreased through the years, 40 percent felt increased competition from other U.S. fishermen was a factor, while 19 percent thought competition from foreign vessels was involved. Approximately 39 percent believed there were fewer fish available for harvesting, and 39 percent felt there were too many part-time fishermen.

Regulation of Fishing Efforts in Maine

One of the basic issues important in determining the attitudes of Maine commercial fishermen regarding extended jurisdiction and fishery management practices is whether they think fishing efforts in Maine need to be regulated. In response to this question, 66 percent said there was a need for regulation, 26 percent said it was not necessary, and 7 percent had no opinion.

There was a significant relationship between the county of home port and whether the respondents felt fishing efforts in Maine need to be regulated (Table 6). In the three eastern coastal counties of Waldo, Hancock, and Washington, along with York in the south, a majority of the respondents felt fishing efforts in Maine do need to be regulated. Slightly over half of the respondents in Cumberland, Lincoln, and Knox felt regulation was necessary, while less than a third of the respondents with home ports in Sagadahoc desired regulation.

Table 6

ATTITUDES TOWARD REGULATION OF FISHING EFFORTS BY LOCATION
OF HOME PORT, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
236 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Location of Home Port (by county)	Fishing Efforts in Maine do Need to be Regulated	Fishing Efforts in Maine do not Need to be Regulated	No Opinion
	(percent)		
York	73	27	—
Cumberland	52	33	15
Sagadahoc	30	60	10
Lincoln	58	38	4
Knox	59	24	17
Waldo	72	14	14
Hancock	82	14	4
Washington	68	32	—

($\chi^2 = 33.16$, d.f. = 6, significant at .005)

There are a number of correlations which indicate that those fishermen who are less prosperous tend to see a need for regulation, while those fishermen who are wealthier tend to oppose regulation. It was found that the average value of the vessels owned by those supporting regulation was significantly lower than the average vessel value of those opposed to regulation (Table 7). Similarly those with lower gross fishing incomes (less than \$75,000) favored regulation more than those with higher gross fishing incomes (Table 8). Furthermore, it was apparent that those respondents with family income less than in the \$11,000 range were more likely to see a need for regulation than those with higher family incomes (Table 9).

As would be expected, a significant relationship also existed between attitudes toward the overall benefit of the FCMA and attitudes toward regulation. Generally, a high percentage of the respondents who thought the FCMA would be very or somewhat beneficial also desired regulation (Table 10).

Table 7

MEAN CURRENT ESTIMATED VALUE OF FISHING VESSELS BY ATTITUDES
TOWARD REGULATION OF FISHING EFFORTS, MAIL SURVEY OF
MAINE COMMERCIAL FISHERMEN, 240 RESPONDENTS,
SEPTEMBER/OCTOBER 1978

Attitudes Toward Regulation of Fishing Efforts	Average Value of Vessel	Total Respondents
	Dollars	Number
Regulation Needed	17,714	160
Regulation Not Needed	27,727	64
No Opinion	15,515	16

(F = 4.35, d.f. = 2, significant at .01)

Table 8

ATTITUDES TOWARD REGULATION OF FISHING EFFORTS BY GROSS
FISHING INCOME, MAIL SURVEY OF MAINE COMMERCIAL
FISHERMEN, 220 RESPONDENTS,
SEPTEMBER/OCTOBER 1978

Gross Fishing Income (in dollars)	Fishing Efforts Do Need To Be Regulated	Fishing Efforts Do Not Need To Be Regulated	No Opinion
	(percent)		
< 10,999	68	25	7
11,000 - 24,999	72	23	5
25,000 - 75,000	68	24	8
> 75,000	47	47	6

($\chi^2 = 5.97$, d.f. = 6, not significant at .05)

Table 9

ATTITUDES TOWARD REGULATION OF FISHING EFFORTS BY TOTAL
FAMILY INCOME, MAIL SURVEY OF MAINE COMMERCIAL
FISHERMEN, 210 RESPONDENTS,
SEPTEMBER/OCTOBER 1978

Total Family Income (in dollars)	Fishing Efforts Do Need To Be Regulated	Fishing Efforts Do Not Need To Be Regulated	No Opinion
	(percent)		
< 10,999	79	18	3
11,000 - 19,999	66	28	6
20,000 - 40,000	65	27	7
> 40,000	65	20	5

($\chi^2 = 5.26$, d.f. = 6, not significant at .05)

Table 10

ATTITUDES TOWARD REGULATIONS OF FISHING EFFORTS BY
 ATTITUDES TOWARD THE BENEFIT OF THE FCMA, MAIL
 SURVEY OF MAINE COMMERCIAL FISHERMEN,
 246 RESPONDENTS, SEPTEMBER/
 OCTOBER 1978

Overall Impact of FCMA	Fishing Efforts Do Need To Be Regulated	Fishing Efforts Do Not Need To Be Regulated	No Opinion
	(percent)		
Very Beneficial	69	25	6
Somewhat Beneficial	77	19	4
No Effect	37	63	—
Very/Somewhat Detrimental	38	52	10
No Opinion	41	36	23

($\chi^2 = 45.15$, d.f. = 10, significant at .005).

The respondents were also asked to indicate why they thought fishing efforts in Maine do or do not need to be regulated. Among those fishermen who said regulation is not necessary, the commonly given reason was that it imposes on the independence of the fishermen. Among those respondents who believed regulation is needed, the factors most commonly mentioned were too many part-time fishermen and a need for greater control in the harvesting sector of the fishing industry.

The fishermen were then asked to check off from a list of management techniques those that they would most like to see implemented. Forty-six percent felt that gear restrictions (such as net size) should be used, 45 percent thought the number of licenses should be restricted, and 37 percent agreed that closed seasons should be implemented. Only 21 percent of the respondents felt there should be closed areas, and only 12 percent thought quotas should be used.

Effect of Foreign Vessels on Maine Landings

The presence of foreign vessels in the area traditionally thought of as New England's prime fishing ground has been an issue of much controversy. Therefore, the fishermen were asked what effect they thought these foreign vessels have had on Maine's harvest in recent years. Overall, 67 percent of the respondents thought the foreign vessels caused a great decrease in Maine landings, while 16 percent thought they caused a slight decrease and 16 percent had no opinion. Only one percent of the respondents felt foreign fleets had no effect on Maine's harvest.

The only variable significantly correlated with perceptions regarding the effect of foreign vessels was the attitude towards transferring offshore. It was found that those who thought it would be profitable to transfer offshore were more likely to think the foreign vessels had greatly decreased Maine's harvest in recent years (Table 11). This appears to be a reasonable relationship, in that those who felt there had been a severe decrease in Maine landings due to the foreign vessels would likely see the potential profit in transferring to the offshore area now that foreign vessels are more restricted.

Table 11

ATTITUDES TOWARD FOREIGN VESSELS AND THEIR EFFECT ON MAINE'S HARVEST BY ATTITUDES TOWARD TRANSFERRING OFFSHORE, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 225 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Attitude Toward Transferring Offshore	Effect of Foreign Vessels on Maine's Harvest		
	Slight Decrease	Great Decrease	No Opinion
		(percent)	
Will Be Profitable	17	73	10
Will Not Be Profitable	15	66	19
No Opinion	15	56	29

($\chi^2 = 10.31$, d.f. = 6, significant at .025)

No other variables exhibited a significant correlation with perceptions towards the impact of the foreign vessels on Maine landings, or even showed any discernible differences. This could possibly imply that these perceptions towards the foreign vessels are based on purely individual factors, such as a fisherman's own personal encounters, or lack of them, with foreign vessels.

Potential of Restrictions on Foreign Vessels

One of the major objectives of the FCMA is to restrict foreign vessels within a 200 mile zone off the U.S. coast. Accordingly, the commercial fishermen were asked whether they thought these restrictions would affect the use of Maine's harvest in coming years. Overall, 45 percent of the respondents felt the restrictions on foreign vessels would increase Maine's harvest greatly, 40 percent believed the restrictions would increase Maine's landings somewhat, nine percent had no opinion, and only six percent of the respondents felt the restrictions would have no effect.

As would be expected, there was a significant correlation in that those who thought it would be profitable to transfer offshore were more likely to think the foreign vessel restrictions would increase Maine's harvest greatly (Table 12). It seems possible that those fishermen who are optimistic and believe it would be profitable to transfer offshore also tend to be optimistic about the potential of the foreign vessel restrictions.

Table 12

ATTITUDES TOWARD EFFECT OF FOREIGN VESSEL RESTRICTIONS ON
FUTURE MAINE HARVESTS BY ATTITUDES TOWARD TRANSFERRING
OFFSHORE, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
228 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Attitudes Toward Transferring Offshore	Effect of Foreign Vessel Restrictions on Future Maine Harvests			
	No Effect	Harvest Will Increase Slightly	Harvest Will Increase Greatly	No Opinion
	(percent)			
Will Be Profitable	5	36	55	4
Will Not Be Profitable	13	39	37	11
No Opinion	2	52	31	15

($\chi^2 = 19.83$, d.f. = 6, significant at .01)

A number of correlations seem to indicate that the older fishermen see a greater potential in the foreign vessel restrictions than the younger ones. There was a statistically significant relationship between those respondents who had been employed as fishermen for more than five years and those likely to think the foreign vessel restrictions would result in a great increase in Maine's harvest (Table 13). A similar finding was found with the age of the respondents. Those fishermen 35 and older were more likely to think there would be a great increase in Maine landings, while the fishermen younger than 35 were more likely to think Maine's harvest would increase somewhat (Table 14).

There were some apparent differences in the relationship between total family income and attitudes concerning the effects of foreign vessel restrictions, though overall it was not statistically significant (Table 15). A greater percentage of those in the lowest income category thought the restrictions would have no effect than did those in the higher income categories.

Table 13

ATTITUDES TOWARD EFFECT OF FOREIGN VESSEL RESTRICTIONS ON FUTURE MAINE HARVESTS BY LENGTH OF TIME EMPLOYED AS A FISHERMAN, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 221 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Length of Time Employed as a Fisherman (in years)	Effect of Foreign Vessel Restrictions on Future Maine Harvests			
	No Effect	Harvest Will Increase Slightly	Harvest Will Increase Greatly	No Opinion
	(percent)			
1 - 5	8	43	26	23
6 - 10	6	28	57	9
11 - 20	2	48	40	10
21 - 30	8	42	50	—
> 30	5	39	51	5

($\chi^2 = 22.65$, d.f. = 12, significant at .05)

Table 14

ATTITUDES TOWARD EFFECT OF FOREIGN VESSEL RESTRICTIONS ON FUTURE MAINE HARVESTS BY AGE OF RESPONDENTS, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 232 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Age of Respondents (in years)	Effect of Foreign Vessel Restrictions on Future Maine Harvests			
	No Effect	Harvest Will Increase Slightly	Harvest Will Increase Greatly	No Opinion
	(percent)			
≤ 34	8	46	37	9
35 - 49	5	38	47	10
≥ 50	3	37	51	9

($\chi^2 = 4.31$, d.f. = 6, not significant at .05)

Overall Benefit of the FCMA

Since Maine commercial fishermen are directly affected by the FCMA through its management plans and restrictions on foreign vessels, it is important to understand whether they think this legislation will be beneficial or detrimental to them overall. In general, 37 percent of the respondents indicated that they thought the legislation would be very beneficial, 43 percent thought it would be somewhat beneficial, 10 percent thought it would be very or somewhat detrimental, and 10 percent thought it would have no effect or had no opinion.

Table 15

ATTITUDES TOWARD EFFECT OF FOREIGN VESSEL RESTRICTIONS ON FUTURE
MAINE HARVESTS BY TOTAL GROSS FAMILY INCOME
MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
204 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Total Gross Family Income (in dollars)	Effect of Foreign Vessel Restrictions on Future Maine Harvest			
	No Effect	Harvest Will Increase Slightly	Harvest Will Increase Greatly	No Opinion
	(percent)			
< 10,999	11	36	36	17
11,000 - 19,999	6	40	47	7
20,000 - 40,000	6	39	46	9
≥ 40,000	—	35	30	15

($\chi^2 = 6.22$, d.f. = 9, not significant at .05)

In general, it appears that the younger fishermen are more likely to think the FCMA will be harmful. The significant relationship between length of time employed as a fisherman and attitudes toward the impact of the FCMA exhibited a trend in which those fishermen employed less than 20 years were more likely to think the FCMA would be detrimental (Table 16). There was also a similar finding in which a greater percentage of the respondents who were younger than 50 were likely to think the FCMA would be detrimental than was the case among those 50 or older (Table 17).

Table 16

ATTITUDES TOWARD THE OVERALL IMPACT OF THE FCMA BY LENGTH
OF TIME EMPLOYED AS A FISHERMAN, MAIL SURVEY OF MAINE
COMMERCIAL FISHERMEN, 208 RESPONDENTS,
SEPTEMBER/OCTOBER 1978

Length of Time Employed as a Fisherman (in years)	Overall Impact of the FCMA			
	Very Beneficial	Somewhat Beneficial	Very/Somewhat Detrimental	No Effect No Opinion
	(percent)			
1 - 5	32	50	12	6
6 - 10	48	29	14	9
11 - 20	24	57	12	7
21 - 30	56	33	6	5
> 30	39	42	2	17

($\chi^2 = 19.97$, d.f. = 12, significant at .05)

Table 17

ATTITUDES TOWARD THE OVERALL IMPACT OF THE FCMA BY AGE OF THE RESPONDENTS, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 223 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Age of Respondent (in years)	Overall Impact of FCMA			
	Very Beneficial	Somewhat Beneficial	Very/Somewhat Detrimental	No Opinion
	(percent)			
< 35	32	44	14	10
35 - 49	40	38	12	10
≥ 50	41	48	1	10

($\chi^2 = 7.89$, d.f. = 6, not significant at .05)

As expected, a significant correlation also existed between the attitudes toward transferring offshore and the overall impact of the FCMA. A majority of those who felt the FCMA would be beneficial also thought it would be profitable to transfer offshore, while the majority of those who viewed the legislation as detrimental thought it would not be profitable to transfer offshore (Table 18).

Table 18

ATTITUDES TOWARD THE OVERALL IMPACT OF THE FCMA BY ATTITUDES TOWARD TRANSFERRING OFFSHORE, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 220 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Attitude Toward Impact of FCMA	Attitude Toward Transferring Offshore		
	Will Be Profitable	Will Not Be Profitable	No Opinion
	(percent)		
Very Beneficial	54	23	23
Somewhat Beneficial	47	28	25
Very/Somewhat Detrimental	33	62	5
No Opinion	29	33	39

($\chi^2 = 16.84$, d.f. = 6, significant at .01)

There were also a number of differences between attitudes toward the impact of the FCMA and location of home port, though the overall correlation was not statistically significant. For example, a third of the respondents from Sagadahoc thought the legislation would be detrimental, while in Knox, Hancock, and Washington counties 5 percent or fewer thought the FCMA would be detrimental (Table 19).

The correlation between gross fishing income and attitudes toward the impact of the FCMA was not statistically significant, but did show

Table 19

ATTITUDES TOWARD THE OVERALL IMPACT OF THE FCMA BY LOCATION OF HOME PORT, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 217 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Location of Home Port (by county)	Overall Impact of the FCMA			
	Very Beneficial	Somewhat Beneficial	Very/Somewhat Detrimental	No Opinion
	(percent)			
York	42	42	13	3
Cumberland	37	33	17	13
Sagadahoc	34	33	33	—
Lincoln	36	36	16	12
Knox	55	33	4	8
Waldo	43	29	14	14
Hancock	27	57	3	13
Washington	48	47	5	—

($\chi^2 = 28.72$, d.f. = 21, not significant at .05)

that among those respondents with incomes higher than \$75,000, a quarter of the fishermen felt the FCMA would be detrimental, while in the other income categories only 7 to 11 percent of the respondents felt it would be detrimental (Table 20).

Table 20

ATTITUDES TOWARD THE OVERALL IMPACT OF THE FCMA BY GROSS FISHING INCOME, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 207 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Gross Fishing Income (in dollars)	Overall Impact of the FCMA			
	Very Beneficial	Somewhat Beneficial	Very/Somewhat Detrimental	No Opinion
	(percent)			
< 10,999	38	43	9	10
11,000 - 24,999	36	46	7	11
25,000 - 75,000	37	42	11	10
> 75,000	32	37	26	5

($\chi^2 = 6.52$, d.f. = 9, not significant at .05)

Attitudes Toward Transferring Offshore

The Maine commercial fishing fleet has traditionally been characterized by small, family owned vessels which are not capable of extended trips into offshore areas. With the restrictions on foreign vessels imposed by the FCMA there is now a much greater expanse of ocean available to domestic fishermen where they can harvest without heavy foreign competition. Thus it is important to determine whether Maine

fishermen feel it will be profitable to transfer their fishing operations offshore.

Overall, 46 percent of the respondents indicated they thought it would be profitable to transfer offshore, 30 percent thought it would not be profitable, and 24 percent had no opinion.

Those respondents whose vessel had a current estimated value of at least \$12,000 were more likely to think transferring would be profitable (Table 21). There was also a tendency for those respondents with gross fishing incomes of at least \$76,000 or less than \$11,000 to feel transferring would be profitable (Table 22). This seems to reveal a general trend in which those fishermen who are relatively well off financially, along with fishermen with a very low gross fishing income who perhaps have aspirations to increase their fishing income, are the most likely to feel transferring offshore would be profitable.

Table 21

ATTITUDES TOWARD TRANSFERRING OFFSHORE BY CURRENT ESTIMATED VALUE OF VESSEL, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 227 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Current Estimated Value of Vessel (in dollars)	Attitude Toward Transferring Offshore		
	Would Be Profitable	Would Not Be Profitable	No Opinion
		(percent)	
50 - 5,999	32	28	40
6,000 - 11,999	28	44	28
12,000 - 31,999	50	30	20
32,000 - 64,999	58	25	17
65,000 - 99,999	65	23	12
100,000	45	23	22

($\chi^2 = 16.02$, d.f. = 10, not significant at .05)

Table 22

ATTITUDES TOWARD TRANSFERRING OFFSHORE BY GROSS FISHING INCOME, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 210 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Gross Fishing Income (in dollars)	Attitudes Toward Transferring Offshore		
	Would Be Profitable	Would Not Be Profitable	No Opinion
		(percent)	
< 10,999	52	31	17
11,000 - 24,999	45	31	24
25,000 - 75,000	38	38	24
> 75,000	65	15	20

($\chi^2 = 6.03$, d.f. = 6, not significant at .05)

A statistically significant relationship existed between the number of years employed as a fisherman and attitudes towards transferring offshore (Table 23). It was found that those respondents who had been working as fishermen for 6 to 30 years were the most likely to think transferring offshore would be profitable, while those who had worked for less than 6 years or more than 30 years were more apt to feel transferring would not be profitable.

Table 23

ATTITUDES TOWARD TRANSFERRING OFFSHORE BY LENGTH OF TIME EMPLOYED
AS A FISHERMAN, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
216 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Length of Time Employed as a Fisherman in years)	Attitudes Toward Transferring Offshore		
	Will Be Profitable	Will Not Be Profitable (percent)	No Opinion
1- 5	31	34	35
6 - 10	63	26	11
11 - 20	51	26	23
21 - 30	53	26	21
≥ 30	29	34	37

($\chi^2 = 16.03$, d.f. = 8, significant at .05)

After indicating whether or not they thought it would be profitable to transfer offshore, the respondents were asked to indicate their reasons for thinking so by checking off from a list any factors they felt were relevant. Among those fishermen who thought it would be profitable to transfer, the most commonly given reason was that there are more fish available offshore (Table 24). Among the miscellaneous reasons filled in by respondents under the "other" category were that for offshore there would be more of a year round fishery and there would also be fewer part-time fishermen.

Among those respondents who thought it would not be profitable to transfer offshore, the most commonly listed factor was the expense (Table 25).

Plans Regarding Transferring Offshore

To determine whether the FCMA will motivate Maine fishermen to change their fishing patterns, they were asked whether they thought they would ever transfer offshore. Overall, 54 percent of the respon-

Table 24

REASONS FOR TRANSFERRING OFFSHORE, MAIL SURVEY OF MAINE
COMMERCIAL FISHERMEN, 110 RESPONDENTS,
SEPTEMBER/OCTOBER 1978

Reasons	Percent Agreed
More fish available for harvest offshore	76
Less competition from other U.S. vessels offshore	45
Less competition from foreign vessels offshore	33
Different species available for harvest offshore	32
Other	10

Table 25

REASONS FOR NOT TRANSFERRING OFFSHORE, MAIL SURVEY OF
MAINE COMMERCIAL FISHERMEN, 74 RESPONDENTS,
SEPTEMBER/OCTOBER 1978

Reasons	Percent Agreed
Too expensive	73
Too many changes in equipment	58
Competition with larger boats	41
Content with present situation	19
Other	19
Too little market demand for species available offshore	12

dents said they would not transfer, 32 percent said they might transfer, and 14 percent said they would transfer or had already done so.

As would be expected, those respondents who indicated they thought it would be profitable to transfer offshore were the most likely to actually transfer, or consider transferring, while the majority of those who said it would not be profitable also indicated they would not transfer (Table 26).

Table 26

PLANS REGARDING TRANSFERRING OFFSHORE BY ATTITUDES TOWARD TRANSFERRING
OFFSHORE, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
233 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Attitudes Toward Transferring Offshore	Plans Regarding Transferring Offshore		
	Will Transfer/ Already Have	Will Not Transfer	Might Transfer
		(percent)	
Will Be Profitable	23	36	41
Will Not Be Profitable	6	73	21
No Opinion	5	66	29

($x^2 = 30.46$, d.f. = 4, significant at .005)

In terms of age, the youngest respondents indicated a greater willingness to transfer, while in terms of length of time employed as a fisherman, those who had been working for six to twenty years were more likely to transfer (Tables 27 and 28). Only nine percent of those who had been working as fishermen for five years or less said they would transfer or already had, though a majority, 57 percent, said they might transfer. These observations seem to indicate that, in general, the younger/middle-aged fishermen are more likely to transfer. Though those who have been working for at least six years are more definite about their plans than those who have been working as fishermen for five years or less, it is possible that it is too early for the newest fishermen to analyze the pros and cons of keeping their present fishing operation versus transferring offshore, since they have less experience to base their opinions on. Also, some of them may have started fishing after the FCMA was passed, and thus have no other management systems to compare with the present one. Thus, it seems likely that the majority of these fishermen who have been working for five years or less said they might transfer since they are still young enough to wait and see how their fishing businesses fare in the next few years and still have time to make a major change in their fishing operation if they wish in later years.

Table 27

PLANS REGARDING TRANSFERRING OFFSHORE BY AGE OF RESPONDENTS,
MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
235 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Age of Respondents (in years)	Plans Regarding Transferring Offshore		
	Will Transfer/ Already Have	Will Not Transfer	Might Transfer
		(percent)	
< 35	23	30	47
35 - 49	13	49	38
≥ 50	3	88	9

($\chi^2 = 55.33$, d.f. = 4, significant at .005)

A number of correlations indicate that it is the more prosperous fishermen who are more likely to transfer. Those respondents who said they would transfer, or already had, had a mean current estimated vessel value more than twice the vessel value of those who said they would not transfer (Table 29). Furthermore, those fishermen, with a high gross fishing income, more than \$75,000, were more likely to say they would or might transfer than those with lower fishing incomes

Table 28

PLANS REGARDING TRANSFERRING OFFSHORE BY LENGTH OF TIME EMPLOYED
AS A FISHERMAN, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
221 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Length of Time Employed as a Fisherman (in years)	Plans Regarding Transferring Offshore		
	Will Transfer/ Already Have	Will Not Transfer	Might Transfer
		(percent)	
1 - 5	9	34	57
6 - 10	21	49	30
11 - 20	19	39	42
21 - 30	13	61	26
> 30	—	95	5

($\chi^2 = 45.10$, d.f. = 8, significant at .005)

(Table 30). Similarly, those with higher total family incomes also indicated a greater willingness to transfer offshore (Table 31).

Table 29

PLANS REGARDING TRANSFERRING OFFSHORE BY MEAN CURRENT ESTIMATED
VALUE OF VESSEL, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
234 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Plans Regarding Transferring Offshore	Mean Current Estimated	
	Value of Vessel (in dollars)	Total Respondents
Will Transfer/Already Have	36,698	33
Will Not Transfer	15,348	127
Might Transfer	22,362	74

($F = 11.19$, d.f. = 2, significant at .005)

Table 30

PLANS REGARDING TRANSFERRING OFFSHORE BY GROSS FISHING INCOME,
MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
214 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Gross Fishing Income (in dollars)	Plans Regarding Transferring Offshore		
	Will Transfer/ Already Have	Will Not Transfer	Might Transfer
		(percent)	
≤ 10,999	9	60	31
11,000 - 24,999	16	58	26
25,000 - 75,000	13	49	38
> 75,000	29	28	43

($\chi^2 = 10.27$, d.f. = 6, not significant at .05)

Table 31

PLANS REGARDING TRANSFERRING OFFSHORE BY TOTAL FAMILY INCOME,
MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
204 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Total Family Income (in dollars)	Plans Regarding Transferring Offshore		
	Will Transfer/ Already Have	Will Not Transfer (percent)	Might Transfer
< 10,999	8	55	37
11,000 - 19,999	16	59	25
20,000 - 40,000	12	54	34
> 40,000	35	35	30

($x^2 = 10.27$, d.f. = 6, not significant at .05)

It was interesting to note that a higher percentage of those who said they thought the FCMA would be detrimental indicated they would/might transfer offshore than was the case among those who indicated they thought the FCMA would be very or somewhat beneficial (Table 32). It could be that those fishermen who feel the FCMA will be beneficial think it will have a positive impact on the more inshore fishing operation, and therefore see no point in transferring offshore. Similarly, those respondents who think the FCMA will be detrimental may feel that transferring offshore is the least unpleasant of the possible options.

Table 32

PLANS REGARDING TRANSFERRING OFFSHORE BY ATTITUDES TOWARD OVERALL
IMPACT OF THE FCMA, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
227 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Attitudes Toward Overall Impact of FCMA	Plans Regarding Transferring Offshore		
	Will Transfer/ Already Have	Will Not Transfer (percent)	Might Transfer
Very Beneficial	19	56	25
Somewhat Beneficial	9	52	39
Very/Somewhat Detrimental	18	41	41
No Opinion	14	54	32

($x^2 = 7.49$, d.f. = 6, not significant at .05)

Many of the fishermen who wish to transfer offshore may have to buy larger vessels and more equipment before they are able to transfer. Since the expense of such a change might be prohibitive to some, the fishermen were asked whether they thought they would ever

sell their vessel and invest in an offshore vessel as part of a group. Overall, 15 percent of the respondents said they would consider a joint investment, 63 percent said they would not, and 22 percent said perhaps in the future. There was a significant correlation between plans regarding group investment and plans regarding transferring offshore (Table 33).

Table 33

PLANS REGARDING TRANSFERRING OFFSHORE BY PLANS REGARDING JOINT INVESTMENT IN AN OFFSHORE VESSEL, MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN, 229 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Plans Regarding Transferring Offshore	Plans Regarding Group Investment		
	Will Invest	Will Not Invest	May Invest in Future
		(percent)	
Will Transfer/Already Have	41	32	27
Will Not Transfer	3	84	13
Might Transfer	21	45	34

($\chi^2 = 56.08$, d.f. = 4, significant at .005)

After the respondents were asked whether they thought they would ever transfer offshore, those who said they would or might were asked to indicate in how many years they would do so (Table 34). More than half of those fishermen who are considering transferring indicated they would do so within the next three years.

Table 34

WHEN TRANSFERRING WILL TAKE PLACE AMONG RESPONDENTS WHO ARE CONSIDERING TRANSFERRING OFFSHORE, MAIL SURVEY, MAINE COMMERCIAL FISHERMEN, 63 RESPONDENTS, SEPTEMBER/OCTOBER 1978

When Planning on Transferring (in years)	Percentage of Respondents
1	14
2	25
3	13
4	10
5	25
6 - 10	11
≥ 11	2

Those fishermen who are considering transferring were also asked to list the major species they expected to harvest. Fifty-two percent of

those who are considering transferring said their catch would include lobster, 31 percent said they would harvest cod, 28 percent said they would catch haddock, and 22 percent indicated groundfish in general. Other species mentioned by at least 10 percent of those who are considering transferring include flounder, hake, halibut, pollock, swordfish, and scallops.

Most of those fishermen who consider transferring offshore will have to make changes in their equipment. The major change most often mentioned was getting a larger boat (82 percent of those respondents who are considering transferring). Thirty-two percent also said more, and better gear in general, 21 percent indicated they would need better electronic equipment, and 14 percent said they would require more and larger traps. The estimated cost of these changes ranged from \$400 to 500,000 dollars (Table 35).

Table 35

ESTIMATED COST OF CHANGE IN EQUIPMENT NEEDED TO TRANSFER OFFSHORE,
MAIL SURVEY OF MAINE COMMERCIAL FISHERMEN,
88 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Estimated Cost of Changes (in dollars)	Mean Cost (in dollars)	Percentage of Respondents
0 - 25,000	13,200	8
25,001 - 50,000	44,230	16
50,001 - 100,000	87,310	30
100,001 - 200,000	166,250	23
200,001 - 500,000	341,330	13

Table 36

OBSTACLES EXPECTED TO BE ENCOUNTERED BY FISHERMEN WHO TRANSFER
OFFSHORE, MAIL SURVEY, MAINE COMMERCIAL FISHERMEN,
152 RESPONDENTS, SEPTEMBER/OCTOBER 1978

Obstacle	Percentage of Respondents
Financial Problems	46
Government Regulations	23
Weather	20
Market Problems	18
Competition with Foreign Vessels	12
Competition with Other U.S. Vessels	9
Inexperience	9
Lack of Cooperation Among Fishermen	8
Danger to Fish Stock Levels	7
Problems with Canadians	3

To finance these changes, 23 percent of the respondents who are considering transferring offshore said they would use a bank loan, 13 percent said they would use personal savings, and 11 percent indicated they would use a government loan.

All the respondents were asked to list the obstacles they thought would be encountered by those fishermen who transfer offshore (Table 36). Most often listed were financial problems such as the expense of buying an offshore vessel and difficulties in making a profit when quotas are low.

CONCLUSIONS

What do all these findings imply for the future of the harvesting sector of Maine's fishing industry? A majority (67 percent) of the respondents indicated they felt fishing efforts in Maine need to be regulated. Most of these fishermen favoring regulations tended to be less prosperous, while the wealthier fishermen were generally opposed to regulation. It could be that the less prosperous fishermen view regulation as a means of more equitably distributing profits from fishing.

Overall, 46 percent of the respondents felt it would be profitable to transfer offshore, though only 14 percent indicated they actually would transfer or had already done so. It was those fishermen who were fairly young or middle aged, and/or fairly well off financially who said they thought it would be profitable to transfer and also planned on transferring. Those respondents who had very low gross fishing incomes also indicated it would be profitable to transfer, though few thought they actually would. It would thus appear that there is a group of fishermen who are less prosperous and who believe it would be profitable to transfer, but for various reasons, probably financial, do not think they ever will actually transfer. Because there is a large difference in the percentage of respondents who thought it would be profitable to transfer and those who are actually planning on it, a system of incentives or aids to help offset the financial burden might be considered to help more fishermen become capable of transferring to the offshore waters.

Only 15 percent of the respondents indicated they would ever consider selling their vessel and investing in a large offshore vessel as part of a group, and even among those fishermen who said they would transfer, only 41 percent said they would invest as part of a

group. This seems to indicate a strong sentiment towards maintaining the individualized nature of the Maine fishing fleet. Therefore, a system of loans or subsidies might be useful in helping fishermen who wish to transfer their fishing operation offshore while retaining sole ownership.

There are many topics involved in the study of Maine commercial fishermen and their reactions to the FCMA which merit further research. Specifically, a more detailed study of attitudes and plans regarding the possibility of transferring fishing operations offshore, including specific problems and obstacles, would give more insight into the future of the harvesting sector of the Maine fishing industry.