An Economic Analysis of Commercial Fisheries in the Pamlico Sound Area, North Carolina

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INTRODUCTION

North Carolina's coastal fishery resources are a source of economic and social importance to many coastal communities. The harvest of these resources has created a demand that may be exceeding the capacity of the North Carolina's marine ecosystem. In response to decreased fishery resources, the North Carolina Marine Fisheries Commission (MFC), National Marine Fisheries Service (NMFS), the Atlantic States Marine Fisheries Commission (ASMFC), and the South Atlantic Fisheries Management Council (SAFMC) have recommended regulations that have placed restrictions on fishing activities to manage the resources. There are currently restrictions on blue crab, flounders, shrimp, mullet, oysters, hard clams, and many others, enforced primarily by the North Carolina Division of Marine Fisheries (DMF) in the subject area.

Understanding the impacts of these restrictions on individual fishermen, as well as the industry as a whole, requires knowledge of the socioeconomic aspects of the fishing industry. This information is useful in the development of state fishery management plans directed toward species, gears, areas, or any combination of species, gears, and areas under the North Carolina Fisheries Reform Act of 1997. Currently, this type of information is not generally available.

This report is the second in a series of studies to characterize commercial fisheries in coastal North Carolina. The purpose of these studies is to collect socioeconomic data about commercial fisheries in coastal North Carolina. The specific objectives of this study were:

1. To describe the socioeconomic aspects of commercial fisheries in the Pamlico Sound area. Descriptions include demographic characteristics of commercial fishermen, dependence on commercial fishing, employment opportunities, fishing activities, and seafood dealer businesses;
2. To collect costs and earnings information from commercial fishermen and seafood dealers and develop estimates of the costs, earnings, and returns associated with commercial fishing; and
3. To assess commercial fishermen's perceptions of fishery regulations and identify problems facing the seafood dealers.

STUDY AREA

The study area is composed of five counties surrounding the Pamlico Sound and its tributaries: Dare (from Oregon Inlet to south of the county), Hyde, Beaufort, Pamlico, and Craven (Figure 1). These counties collectively accounted for 47% of North Carolina's total commercial fisheries landings and 54% of its total landed values in 1999.

METHODOLOGY

The data used in this study came primarily from two sources: (1) Trip ticket and license databases from DMF, and (2) surveys conducted by project personnel.

Trip ticket and license databases were used to determine the number of commercial fishermen and their dependence on various fisheries and to identify seafood dealers from the study area.

Two types of in-person surveys were used to collect socioeconomic information from selected commercial fishermen and seafood dealers in the study area (Appendix A). The first survey was administered to commercial fishermen who held vessel licenses issued by the DMF in 1999 and reported a total annual landed value of at least $1,000 to the trip ticket program. As a result, 977 commercial fishermen were identified for this study (Table 1).

Table 1. Number of commercial fishermen and sample sizes by fishing gear types, 1999

Fishing gear types	Number of participants	Sample size	Interviews completed
Crab pots	301	65	59
Gill nets	63	20	16
Trawls	79	15	12
Pound nets	2	1	1
Other gear types	22	4	4
Multiple gears	510	90	54
Total	977	195	146

In order to select a representative panel, the sampling frame was stratified by fishing gear types. Commercial fishing gear types were categorized as crab pots, trawls, gill nets, pound nets, other gear types, and multiple gears, i.e., a combination of two or more gears (Table 1). A random sample of 195 (20%) commercial fishermen was selected for interviews during June-September 2000 with a survey completion rate of 75%.

In addition, 92 seafood dealers from the 180 dealers identified in the study area were also randomly selected for interviews. A total of 85 interviews were completed.

DEMOGRAPHIC CHARACTERISTICS OF COMMERCIAL FISHERMEN

Nearly all survey respondents (81%) were owner-operators, while only 19% were organized as partnerships. Seventy-four percent of the respondents fished full-time during 1999. The majority of commercial fishermen fished exclusively in Pamlico Sound and its tributaries.

The average age of all respondents was 47 years and ranged from 17 to 88 years (Figure 2). Overall, the largest age group was made up of fishermen from 35 to 54 years of age. More than 10% were over 65 years of age. In contrast, few fishermen were under 20 years of age. In a previous study, Johnson and Orbach (1996) reported overall means of 46 years and 53 years for full-time and part-time commercial fishermen, respectively, in the study area.

The average number of years of experience in commercial fishing was about 24 compared to 19 years of non-fishing employment (Figure 3). Approximately three-fourths (72%) of all respondents had 10 years or more of experience working the water, whereas about a fifth (18%) had less than five years of experience.

There was a strong integration of commercial fishermen into their local communities. The average number of years that survey respondents had lived in their local communities ranged from 2 to 85 years with a mean of approximately 31 years. About a tenth (9%) had lived in their communities less than 5 years and another tenth had between 5 and 10 years of community integration. About two-thirds of the respondents were integrated into their local communities for more than 20 years.

The majority (88%) of survey respondents were male (Figure 4). Approximately three-fourths (72%) of commercial fishermen were married (Figure 5), and about a fifth (18%) supported two or more dependents. In a previous study by Johnson and Orbach (1996), similar results were reported for gender and marital status of commercial fishermen for this study area.

Almost all of the respondents were Caucasian, followed by African-American (3%), Native-American (2%), Hispanic (1%), and Asian-American (1%) (Figure 6).

Most respondents had a high school diploma or better (Figure 7). One half of the respondents had a high school diploma, and about a quarter (23%) had some college education. Of the respondents who did not graduate from high school, about one half were 55 years or older.

Household income ranged from less than $15,000 to over $100,000, and the average income was $40,000. About a fifth (19%) of the respondents made less than $15,000 in annual household income, and a quarter (25%) reported between $30,000 and $50,000 (Figure 8). About

4% of the respondents earned $100,000 or more. Overall, commercial fishermen with less than a high school education had the lowest reported annual household incomes.

Commercial fishing was the main source of household income, providing, on average, 76% of the total household income in 1999; with a range of 43% for part-timers to 85 % for full-time fishermen. Just over half of the respondents depended exclusively on commercial fishing for household income (Figure 9).

Survey respondents were asked what they would do for a living if not fishing and what would have been their potential earnings. More than a third of the respondents had no idea what to do ("Don't know/nothing"), while others reported construction (16%), retail sales (6%), and factory work (3%). About half of the respondents (49%) would make the same or less than their current earnings, whereas only a quarter (24%) would earn more.

The majority of the respondents were not members of a fishing organization. Only a quarter (24%) belong to the North Carolina Fisheries Association.

COMMERCIAL FISHING OPERATIONS

Commercial fishing operations in the Pamlico Sound area were examined in terms of vessel characteristics, fishing gear types and targeting strategies, and profitability. The information is intended to give an understanding of the nature of variation in fishing operations.

Vessel Characteristics

The average commercial fishing vessel in the Pamlico Sound area was about 34 feet in length with a range of 16 to 105 feet (Table 2). The mean horsepower for all vessels was 140 with a crew size of 2 people. On average, vessels were owned for approximately 10 years. The market value of vessels ranged from $1,000 to $600,000 with an average of approximately $78,000 in 1999.

Table 2. Average vessel characteristics, 1999.

	Mean	**Standard Deviation**	**Minimum**	**Maximum**
Years owned	9.8	7.6	1	45
Length (feet)	33.5	25	16	105
Horse power	140.4	135.9	4	900
Crew size	2.3	0.8	1	7
Market value	$77,523	$148,641	$1,000	$600,000

Fishing Activities

Tables 3a and 3b show all fishing gear patterns of commercial fishermen from the Pamlico Sound area during 1999. Of the 977 commercial fishermen identified for participation in this study, about 48% exclusively used a single fishing method, while 52% participated in multiple gear fishing (NCDMF Trip ticket 2000). As shown in table 3a, among those who fished only one fishing gear, almost two-thirds (64%) exclusively used crab pots, 17% trawls, 13% gill nets, and 6% other types of gears (including pound nets). Table 3b shows the number of fishermen who used each combination of gears reported in 1999. Crab pots (84%) and gill nets (79%) were the most important gears used in combination in multiple gear operations. These results are consistent with those reported by Johnson and Orbach (1996).

Table 3a. Fishermen who used one gear exclusively

Gear Name	Frequency	Percent
Crab Pot	301	64%
Trawl	79	17%
Gill Net	63	13%
Pound Net	2	<1%
Other Gear	22	5%
Total	**467**	**~100%**

Table 3b. Fishermen who used specific gear combinations, 1999

Number of Users	Crab Pot	Trawl	Gill Net	Pound Net	Other Gear
43	X				X
2	X			X	
38	X	X			
10	X	X			X
196	X		X		
75	X		X		X
12	X		X	X	
5	X		X	X	X
26	X	X	X		
20	X	X	X		X
6		X			X
54			X		X
6			X	X	
4			X	X	X
7		X	X		
6		X	X		X
Totals: 510	**427**	**107**	**405**	**29**	**217**
Percent: 100%	**84%**	**21%**	**79%**	**6%**	**43%**

The majority (69%) of commercial fishermen who fished in Pamlico Sound and its tributaries during 1999 (Figure 10) tend to fish only in the Pamlico Sound. Of the total number of trips taken by fishermen who fish the Pamlico Sound at least part of the time, two-thirds (65%) were in the Pamlico Sound itself, accounting for approximately 77% of their total landed value.

Blue crabs, both hard (80%) and soft/peeler (19%) together accounted for 99% of the landings from crab pots. In contrast, shrimp and other species were the main sources of revenues for trawl fishing, while flounders and other species provided the bulk of revenues for gill net fishing (Figure 11).

Overall, commercial fishing operations in the Pamlico Sound area were characterized by a heterogeneous fleet of vessels, gears used and species landed.

Average Returns

The "average" commercial fishing operation was determined based on net operating revenues. Net operating revenues were calculated by subtracting routine fishing trip costs from gross revenues. Routine fishing trip costs included fuel and oil, bait, ice, food, and others. Remaining positive net operating revenues were used to pay labor (crew and captain if applicable) and fixed costs. Negative returns suggest that vessel owners may not be able to cover their trip costs. Captain and crew costs were omitted in this study because there was no uniformity among the remuneration systems used by the fishing operations.

The gross revenues for an 'average' annual commercial fishing operation ranged from about $9,523 to $86,838 (Table 4). Trawl fishing operations had the highest annual revenues, estimated at $86,838, of which $6,048 was spent for routine trip costs and $80,790 was paid to labor and fixed costs. Multiple fishing gear operations earned on average $39,577 in revenues. They paid $13,221 in routine trip costs and $26,356 to labor and fixed costs.

Table 4. Average annual gross revenues and expenditures by fishing gear type, 1999.

	Crab pot fishing	**Gill net fishing**	**Trawl fishing**	**Multiple gear fishing**
Average number of trips	76.2 (50.5)	53.3 (50.5)	25.2 (21.5)	99.3 (63.1)
Total revenues	$23,232 (21,318)	$9,523 (12,781)	$86,838 (112,536)	$39,577 (41,492)
Routine trip costs				
Fuel and oil	$2,910 (2,055)	2,173 (2,021)	$3,637 (5,517)	$7,754 (16,286)
Bait	$7,140 (4,210)			$11,326 (5,501)
Ice	$511 (266)	$698 (700)	$1,284 (2,325)	$3,956 (12,751)
Food	508 (220)	$533 (533)	$1,127 (1,810)	$3,320 (9,786)
Total	$11,129	$6,119	$6,048	$13,221
Net operating revenues	$12,103	$3,404	$80,790	$26,356

* Standard deviations are in parentheses.

Crab pot fishermen received an average of $23,232, while paying $11,129 for routine trip costs, and earned $12,103 to be shared by labor and owners. On average, gill net fishing operations received $9,523 in revenue while paying $6,119 in routine trip costs and $3,404 to

labor and fixed costs. There is a wide disparity in the total revenues reported for the gear types. There are several explanations for these differences. In each case, the standard deviation of the distributions represented by the average values reported in the table is about as large or larger than the average itself, thus indicating that the distributions are normal. The differences within gears, especially among crab potters and gill net fishermen may be attributed to the fact that many of these fishermen do not fish full time. Additionally, the costs associated with the start up of such an operation are much lower than say for a trawler operator who more than likely has far more capital invested in his operation. Owning a trawler also gives the fisherman opportunity to land larger catches thereby increasing total revenue.

Fishing trip costs reported were adversely affected by the impact of hurricanes Dennis and Floyd in August and September of 1999. However, the "average" fishing operation earned sufficient revenues to cover its routine fishing trip costs regardless of the fishing gear type.

Preferences for Fishing Regulations

The survey included a series of questions about respondents' perceptions about a variety of regulations that could be used to manage Pamlico Sound area fisheries. One of these questions asked, "How would you rate state and federal policies and regulations with regard to conserving fish stock and habitat?" Overall, a quarter (25%) and 16% of the respondents reported that state and federal policies and regulations were above average whereas approximately one third reported poor policies (Table 5).

Table 5. Commercial fishermen's ranking of state and federal policies and regulations.

How would you rate state and federal policies and regulations with regard to conserving fish stock and habitat?					
	Excellent	**Good**	**Average**	**Poor**	**Don't know**
State	5%	20%	30%	36%	9%
Federal	1%	15%	22%	34%	28%

Regulatory methods resulting from the development of state fishery management plans						
	Strongly support	**Support**	**Neutral**	**Oppose**	**Strongly Oppose**	**Don't know**
Expansion of the attendance times for gill nets	12%	16%	12%	8%	47%	5%
Potential trip limits for southern flounder	3%	10%	3%	9%	62%	13%
Limits on trawling	11%	19%	9%	7%	36%	18%
Mechanical clam harvest in a portion of southeast Pamlico Sound	8%	6%	11%	12%	17%	46%

Would gill net restrictions affect your horseshoe crab landings? Yes=99% No=1%

Federal restrictions						
	Strongly support	**Support**	**Neutral**	**Oppose**	**Strongly oppose**	**Don't know**
Restrictions on gill nets in inside waters due to interactions of sea turtle and dolphins	4%	11%	8%	17%	35%	25%
Restrictions on gill nets in inside waters due to diving birds	2%	6%	10%	16%	42%	24%

Survey results indicate that, in general, there is opposition to proposed regulatory methods. For example, Table 5 shows that 55% of the respondents indicated opposition to expansion of the attendance times for gill nets. Over two-thirds indicated opposition to potential trip limits for southern flounder. Similarly, over half of the respondents opposed restrictions on gill nets in inside waters due to interactions with sea turtles, dolphins, and diving birds.

SEAFOOD DEALER BUSINESSES

Characteristics of Seafood Dealers

All seafood products landed in North Carolina by law must be sold through licensed seafood dealers. This group includes fishermen who in addition to holding a valid fishing license also hold a dealer's license, wholesalers, distributors, processors, and bait and tackle shops, as well as retail fish markets and many restaurants. In 1999, most (62%) of the seafood dealer firms in the Pamlico Sound area were classified as "dealers only", while 38% were "fishermen with dealer licenses" (Figure 12). In addition, 67% of these seafood dealers were organized as sole proprietorships, followed by corporations (20%), and partnerships (13%) (Figure 13).

There is some evidence of horizontal integration, i.e., multiple locations operated by a single seafood dealer. However, the majority of seafood dealers in the Pamlico Sound area operated as single independent businesses. Only 21% of the seafood dealers operated in at least two locations.

Seafood dealers appeared to be well established in the business (Figure 14). The number of years of ownership averaged 9 years, and ranged from 1 year to 27 years; however, 42% had owned a seafood business less than 5 years. Similarly, the average number of years the business had been in operation (either under present or previous owners) was 11 years; in contrast, about a fifth (21%) of these dealers had been in operation for more than 15 years.

Employment by seafood dealers is entirely dependent on the volume and seasonality of the catches; therefore, it is quite variable within the industry and over the course of a year. An owner-operator dealer as opposed to a corporation is more likely to rely on unpaid family help.

Processors are more likely than other seafood dealers to use seasonal part-time help. Overall, the average employment provided by seafood dealers was about 16 part-time people, 5.8 full-time, and 0.5 family members other than the owner. The majority of these employees were Caucasian (81%), followed by Hispanic (11%), and African-American (8%) (Figure 15). By comparison, the racial make up of the counties included in the study according to the 2000 US Census shows 75% Caucasian, 3% Hispanic, 21% African-American and 2% other race or multiracial (US Census, 2000).

Based on 1999 trip ticket data, purchases per seafood dealer averaged $158,650 and ranged from $15 to over $3 million in 1999. Although seafood dealers with purchases of less than $50,000 dominated the industry by numbers, the largest dealers (>$500,000) accounted for most of the seafood purchases (Figure 16). For example, the smallest dealers (<$20,000) represented about half of all dealers, but less than 2% of the total purchases in 1999. Alternatively, over two-thirds (68%) of all seafood purchases were made by only 10% of the seafood dealers.

The reported sales by seafood dealers ranged from around $30,000 to more than $9 million per year with an overall mean of $1,029,000. “Only dealers” averaged $1,932,000 in sales, while “fishermen/dealers” had mean sales of $50,000. About a quarter (24%) of all seafood dealers reported sales over $1 million in 1999 (Figure 17).

Hard and soft blue crabs accounted for approximately half the total sales in 1999 followed by shrimp (15%), flounders (11%), and others (5%) (Figure 18).

Of the total seafood products sold by seafood dealers, approximately 40% were sold to retail outlets, 34% to other dealers in North Carolina, 24% to out-of-state dealers, and 2% to export (Figure 19). Out-of-state dealers and export accounted for 39% of “only dealers” total sales. Approximately 38% of seafood dealers were integrated backward, i.e. caught their seafood with their own boats or other means, while significant numbers were integrated forward into retailing.

Financial Operations

The information forming the basis of this section comes directly from survey responses of industry participants. Gross sales reported by respondents ranged from “under $30,000” to “$9 million or more”. For the purposes of discussion and analysis, midpoints of sales were reported for the average annual gross sales per seafood dealer by activities.

Table 6. Average expense components for seafood dealers, 1999.

	Only dealers			**Fishermen/Dealers**		
	Number reporting	Mean	% of total cost	Number reporting	Mean	% of total cost
Revenues (Sales)		**$1,931,539 (2,647,617)**			**$50,200 (34,835)**	
Operating Costs						
Raw fish*	28	$896,963 (1,553,821)	54.9%	5	$6,020 (4,550)	13.3%
Labor	30	$209,518 (338,617)	12.8%	9	$10,372 (8,447)	22.8%
Utilities	33	$14,903 (29,518)	0.9%	15	$1,820 (1,511)	4.0%
Transportation	20	$24,675 (40,185)	1.5%	14	$5,961 (4,451)	13.1%
Packaging	24	$119,992 (391,242)	7.4%	13	$2,815 (3,484)	6.2%
Additives	6	$25,650 (39,901)	1.6%	1	$400 (.)	0.9%
Others	4	$49,325 (51,135)	3.0%	1	$1,500 (.)	3.3%
Total Operating Costs		**$1,341,026**	82.1%		**$28,888**	63.6%
Net operating returns		**$590,513**			**$21,312**	
Fixed Costs						
Insurance	21	$13,876 (29,846)	0.8%	2	$950 (72)	2.1%
Repair	26	$25,877 (43,870)	1.6%	11	$2,595 (2,788)	5.7%
Professional services (legal, accounting, etc.)	30	$1,954 (5,363)	0.1%	12	$467 (578)	1.0%
Loan payments	9	$138,420 (374,528)	8.5%	6	$5,783 (3,555)	12.7%
Permits	26	$457 (628)	0.0%	24	$246 (172)	0.5%
Administrative salaries	21	$52,650 (39,729)	3.2%	1	$3,000 (.)	6.6%
Building rental or depreciation	11	$20,736 (36,603)	1.3%	0	0	
Equipment lease or depreciation	5	$12,900 (15,892)	0.8%	0	0	
Other costs	6	$12,517 (21,417)	0.8%	2	$2,800 (3,111)	6.2%
Property and local (non-income) taxes	10	$12,070 (12,606)	0.7%	7	$686 (751)	1.5%
Total fixed costs		**$291,457**	17.9%		**$16,527**	36.4%
Total expenses		**$1,632,483**			**$45,415**	
Net income before taxes		**$299,056**			**$4,785**	

* Standard deviations

Estimated annual gross sales for “only dealers” averaged $1,931,539 in 1999 (Table 6). Of this total, $1,340,026 covered total operating costs while $291,457 went to fixed costs. In terms of individual expenditure categories, the highest expenditures were made for raw products (55%), labor (13%), loan payments (9%), and packaging (7%). After annual expenditures were accounted for, “only dealers “ operations appear to be profitable.

On average, a “fishermen/dealers” earned an estimated $50,200 in gross revenues in 1999. Total annual operating expenses accounted for approximately 64% while total fixed costs represented 36%. After annual expenditures were accounted for, “fishermen/dealers” operation earned an annual return of approximately $5,000 in 1999. Overall, seafood dealer operation appeared to be profitable in 1999 regardless of the marketing activities.

Opinions on Problems facing the Industry

Seafood dealers were presented with several factors that may affect their businesses and asked to indicate whether they thought each was a very important problem, an important problem, a somewhat important problem, or not a problem.

Seafood dealers’ responses are presented in Table 7. The factors that were considered to be a very important problem were “Weather” (93%), “Government regulations/record keeping requirements” (81%), “Others” (78%), and “Increased costs of production” (68%). The factors that were considered as not important by a majority of the primary seafood dealers were “Production” (74%), “Labor” (71%), “Changing market patterns” (62%), and “Hazard Analysis Critical Control Point (HACCP)” (62%). All other factors were rated as somewhat important by a majority of the seafood dealers.

Table 7. Seafood dealers’ rating of problems facing the industry.

Problems	Very important	Important	Somewhat important	Not Important
Government regulations/Record keeping requirements	81%	12%	4%	3%
Hazard Analysis Critical Control Point (HACCP)	16%	9%	12%	63%
Competition from other seafood dealers	6%	27%	37%	30%
Competition from imported seafood	16%	16%	36%	32%
Weather	92%	1%	1%	6%
Inability to obtain adequate financing	17%	25%	37%	21%
Increased costs of production	68%	17%	3%	12%
Adequate supply of seafood	14%	13%	29%	44%
Marketing	14%	27%	28%	31%
Labor problems	1%	7%	20%	72%
Production problems	0%	7%	19%	74%
Transportation/delivery problems	3%	23%	32%	42%
Changing market patterns	2%	15%	20%	63%

Two open-ended questions invited respondents to provide suggestions about marketing activities and to comment on the fulfillment of their needs and expectations by the fishery agencies. Overall, 75% thought there was no need to improve the seafood marketing activities and 58% also thought their needs and expectations were not being met or addressed by fishery agencies. Responses to the open-ended follow-up question "Why" are summarized below:

"DMF should enforce regulations already in the book instead of making new ones. I have had many pots fished and stolen, and it does not seem that Marine Patrol is doing anything to help".

"More fishermen' involvement into the decision-making process".

"Many regulations need to be better researched before being implemented. Many of these regulations seem to have no actual facts that make sense to support them. Some of these regulations used to protect certain species are allowing other species to get out of control. Eventually, they are going to overpopulate and take out other species".

"Instead of making regulations based on computer data, biologists need to spend more time getting actual facts. Biologists don't truly listen to fishermen' concerns when it comes to the regulations that are made. We are trying to make a living by working hard while you sit in an office with an air conditioner. Come work with us for one day and you will understand why we get so angry at you. I need biologists and managers to come fish with me. See the real world. Talk and really listen to fishermen".

"Being told two different rules on licenses. One person says one license says one for fish and one for shrimp. Too much paperwork that doesn't really prove anything (talking about federal)".

"I appreciate what fishery agencies are trying to do, but I don't feel they are collecting facts and enough information before making laws, and even when you do get contrasting information, you still make laws that in the end will hurt the industry more than helping. At times, it seems the Division pays our views a great deal of attention. At other times, it seems as if our views and concerns go in one ear and out the other. I feel that my expectations are high for the industry, however at the rate DMF is making laws, we are all doomed. Overall doing a good job".

"Better control of imports. More enforcement of license rules regarding who may sell goods to general public. Insufficient enforcement of rules governing fishermen selling goods. Roadside stands should be required to meet same requirements we do: inspections, certifications, licenses, and taxes".

"Stop letting too many new fishermen come into the industry. This is making it harder for us to do our job because then DMF tries to say that the waters are overfished and this hurts the ones who have been fishing for years".

SUMMARY AND CONCLUSIONS

This study was conducted to provide baseline economic information concerning commercial fisheries in the Pamlico Sound area. The specific objectives of the study were to (1) describe the socioeconomic aspects of commercial fisheries; (2) collect costs and earnings of commercial fisheries; and (3) assess fishermen's perceptions of fisheries management practices and identify problems facing seafood dealer operations.

The average Pamlico Sound area commercial fisherman was 47 years of age, married (88%), and had a high school education. He/she had 24 years of experience in fishing, which accounted for 76% of the fisherman's total household income in 1999.

Seafood dealers in the Pamlico Sound area, on average, were organized as sole proprietorships, had been in the business for 9 years, and provided full-time and part-time employment in their communities. Retailing and sales to other North Carolina dealers accounted for approximately three-fourths of total sales in 1999.

The study found that commercial harvesting operations averaged positive net operating revenues from their 1999 operations regardless of the fishing gear type. However, when analyzed by fishing gear type, trawl fishing earned the highest net operating revenues. Yet when accounting for costs associated with running their business, most fishermen were barely profitable.

Estimated average annual gross revenue for seafood dealers was about $1,030,000. After annual expenditures were subtracted, the average seafood dealer operation appeared to be profitable. The level of profitability varied substantially between business type.

Most commercial fishermen in the Pamlico Sound area opposed fishery management regulations, such as expansion of the attendance requirement for gill nets or potential trip limits for southern flounder fishing.

Seafood dealers rated as important the following problems facing the industry: weather (93%), government regulations/record keeping requirements (81%), and increased costs of production (68%).

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APPENDIX A:
Survey Instruments

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Division of Marine Fisheries
1999 Pamlico Sound Area Commercial Fishermen Survey
Survey Purpose and Data Confidentiality Statement

			Results				
Attempt No.	Date	Time	Discon.	No answer	Busy	Refused	Succ. Cont.
1							
2							
3							

Hello. My name is _____. I am conducting an economic survey on the behalf of the North Carolina Division of Marine Fisheries.

This survey is being conducted to provide information concerning commercial fisheries in the Pamlico Sound area (Dare, Hyde, Beaufort, Craven, and Pamlico counties). Your input will help to identify potential economic and social effects of fishery management actions that might be proposed by the North Carolina Marine Fisheries Commission and the National Marine Fisheries Service.

Your name was randomly selected from a list of Standard Commercial License holders from Pamlico Sound area. Your responses will be kept strictly confidential and will be combined with the responses of other commercial fishermen. When the data are presented, they will be in the form of summary statistics, so there will be no way of tracing responses back to you.

The survey is voluntary, but we urge you to participate. We need your answers. Fishermen like yourself, who have a vital stake in the management decisions being made, can provide the information necessary to evaluate the economic effects of different options on commercial fishermen.

The interview can take about 25-40 minutes. The purpose of this call is to set up an appointment with you at your convenience to meet with you in person to conduct this interview. It may be helpful to you to have your 1999 (January-December) fishing records available in case you need to refer back to them for revenue and cost data relating to your operation.

Should you have any questions, concerns or suggestions, please don't hesitate to contact Solo Diaby at 1-800-682-2632 Ext. 603 at the Division of Marine Fisheries, Morehead City.

Thank you very much for your assistance.

Date:_____ Starting Time:_____ Ending Time:_____

A. DEMOGRAPHIC INFORMATION

1. How old are you? ____ Years
2. Are you? 1.□ Male 2.□ Female
3. What is your ethnic background?
   - 1.□ African American or Black
   - 2.□ Caucasian
   - 3.□ American Indian
   - 4.□ Asian or Asian American
   - 5.□ Hispanic
4. What was the last grade of school you completed?
   - 1.□ Less than a high school degree
   - 2.□ High school graduate
   - 4.□ College graduate
   - 5.□ Post-graduate or professional degree

3.□ Some college

5. What is your marital status?
   1.□ Single
   2.□ Married
   3.□ Separated
   4.□ Divorced
   5.□ Widowed
6. Excluding yourself, how many people in your household are involved in the fishing industry or do any fishing related work? _____ # individuals
7. Are you supporting any children or adults outside your household right now?
   1.□ Yes ====> If yes, how many? _____ 2.□ No
8. From the following categories, which one best represents your annual household income?
   1.□ $15,000 or less
   2.□ $15,001-$30,000
   3.□ $30,001-$50,000
   4.□ $50,001-$75,000
   5.□ $75,001-$100,000
   6.□ Over $100,000
   7.□ Refused/Don't know
9. What percent of your household's annual income comes from the fishing vs. non-fishing activities?
   Fishing _____% Non-fishing _____%
10. What was your household's main source of income (fishing or non-fishing) last:
    Spring ___ Summer ___ Fall ___ Winter ___
11. Do you belong to any fishing-related organizations? 1.□ Yes 2.□ No
    If yes, please list names of organizations.
12. Do you consider yourself a? 1.□ Full-time fisherman 2.□ Part-time fishermen
13. How many years have you been in commercial fishing? _____ Years
14. Are you engaged in non-fishing employment? 1.□ Yes 2. □ No
    If yes, what?
15. Please indicate years of experience in your non-fishing employment. _____ Years
16. How long have you lived in your community? _____ Years
17. If you were not fishing what do you think you would do for living?
18. What do you think you could earn compared to what you currently earn?
    1.□ Much less
    2.□ Less
    3.□ Same
    4.□ More
    5.□ Much more
    6.□ Don't know
19. Would you advise a young person to go into fishing? 1.□ Yes 2.□ No
20. Would you advise your children to go into fishing? 1.□ Yes 2.□ No

B. FISHERY PARTICIPATION AND EXPENDITURES

21. What is the ownership type that <u>best</u> describes your commercial fishing operation?
    1.□ Sole owner 2.□ Partnership 3.□ Corporation
22. Does the entity that owns this vessel, also own other fishing vessels?
    1.□ Yes ====>If yes, how many? #_____ 2.□ No

If you have more than one vessel, please provide the following information for the first four vessels.

	Vesselid	Years owned	Market value including gear, electronics, etc.	Length (feet)	Average crew *	Operator status** (Circle one)
#1			$			1. 2. 3.
#2			$			1. 2. 3.
#3			$			1. 2. 3.
#4			$			1. 2. 3.

* Including captain

** **Operator status**: 1. Non-operator Owner 2. Captain Owner 3. Captain

The following questions relate to your total fishing operation. Please provide the information for each individual vessel you operate or for all your vessels together.

23. Do you operate your vessels primarily in ?
    1.□ Pamlico Sound and tributaries only
    2.□ Only waters other than Pamlico Sound and its tributaries
    3.□ Both Pamlico Sound and tributaries, and other waters

24. What fisheries did you engage in during 1999? Please indicate fisheries, targeted species, and percent of total fishing related income. For example, if you crab and gill net during the year, then select those fisheries and provide the following information.

What major fisheries did you participate in during 1999?	**Species**	**Percent of total fishing related income in 1999**
1.□ Crab pot fishery		%
2.□ Trawl fishery		%
3.□ Long haul seine fishery		%
4.□ Pound net fisheries		%
5.□ Gill net fisheries		%
6.□ Other gear types fisheries (specify:_____)		%
Total		100 %

25.Please provide the average operating expenses for a typical fishing trip in 1999.Round all answers.

	1999 Vessel expenses				
Expense category	Vessel #1	Vessel #2	Vessel #3	Vessel #4	All vessels
Fuel and oil					
Ice					
Groceries					
Bait					
Other (Specify)					

26. Do you use a share system to pay crew and captain for all your vessels?
    1.□ Yes 2.□ No => How much is the captain and crew share per trip? $_____
    26A. If Yes, which the following expenses were subtracted from your gross total revenues before calculating the crew and captain share? (Circle one number for each)

	DEDUCTED	NOT DEDUCTED
Fuel and oil	1	2
Food	1	2
Bait	1	2
Groceries	1	2
Other	1	2

    26B. What percentage of the net share (gross total revenues minus the expenses indicated above in 26A) goes to:
    Boat share: _____% Crew and captain share:_____%

27. Please provide the total expenditures associated with each of the following categories for 1999. Round all answers.

	1999 Vessel expenses				
Expenses category	Vessel #1	Vessel #2	Vessel #3	Vessel #4	All vessels
Purchase of fishery licenses and permits					
Fishing gear (nets, net electronics, doors, cables, etc.)					
Expenditures on vessel and on-board equipment (other than fishing gear)					
Other capital expenditures related to vessel operations					
Repair and maintenance for vessel and equipment					
Insurance (vessel, P & I)					
Professional services and association fees					
Interest payments associated with this vessel					
Depreciation and amortization					
Other expenses					
Income taxes associated with this vessel					

C. FISHERY MANAGEMENT

28. How would you rate <u>state</u> fishing policies and regulations with regard to conserving fish stock and habitat? Select one:

1.□ Excellent 2.□ Good 3.□ Average 4.□ Poor 5.□ Don't know

29. The following is a list of restrictions resulting from the development of fishery management plans. Please indicate how strongly you support or oppose the use of these restrictions.

1= Strongly Support **3= Neutral** **5= Oppose**
2= Support **4= Strongly oppose** **6= Don't know**

Expansion of the attendance times for gill nets	1	2	3	4	5	6
Potential trip limits for southern flounder	1	2	3	4	5	6
Limits on trawling	1	2	3	4	5	6
Mechanical clam harvest in a portion of southeast Pamlico Sound	1	2	3	4	5	6

30. Would gill net restrictions affect your horseshoe crab landings? 1.□ Yes 2.□ No

If Yes, please explain how:

31. How would you rate <u>federal</u> fishing policies and regulations with regard to conserving fish stock and habitat? Select one:

1.□ Excellent 2.□ Good 3.□ Average 4.□ Poor 5.□ Don't know

32. The following is a list of federal restrictions. Please indicate how strongly you support or oppose the use of these restrictions.

1= Strongly Support **3= Neutral** **5= Oppose**
2= Support **4= Strongly oppose** **6= Don't know**

Restrictions on gill nets in inside waters due to interactions of sea turtle and dolphins	1	2	3	4	5	6
Restrictions on gill nets in inside waters due to diving birds	1	2	3	4	5	6

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Division of Marine Fisheries
1999 PAMLICO SOUND AREA FISH DEALER SURVEY

Survey Purpose and Data Confidentiality Statement

Dear North Carolina's Licensed Fish Dealer:

Hello. My name is _____. I am conducting an economic survey on the behalf of the North Carolina Division of Marine Fisheries.

This survey is being conducted to provide information concerning commercial fisheries in the Pamlico Sound area (Dare, Hyde, Beaufort, Craven, and Pamlico counties). Your input will help fisheries managers to better understand commercial fishing operations like your own and how fishing regulations may affect these businesses.

Your name was randomly selected from a list of seafood dealers from the Pamlico Sound area. Your responses will be kept strictly confidential and will be combined with the responses of other seafood dealers. When the data are presented, they will be in the form of summary statistics, so there will be no way of tracing responses back to you.

The interview can take about 20 minutes. The purpose of this call is to set up an appointment with you at your convenience to meet with you in person to conduct this interview. It may be helpful to you to have your 1999 (January-December) financial records available in case you need to refer back to them for revenue and cost data relating to your operation.

Should you have any questions and/or comments or wish to discuss your response, please contact Solo Diaby at 1-800-682-2632 Ext. 603 at the Division of Marine Fisheries, Morehead City.

Thank you very much for your help and time.

A. BUSINESS CHARACTERISTICS

1. How would you **best** describe your seafood business marketing activities? (Please check **one** item only)
   - 1.□ Fish house/dockside buyer
   - 2.□ Distributor/wholesaler (including packing & freezing)
   - 3.□ Processor
   - 4.□ Importer
   - 5.□ Exporter
   - 6.□ Broker
   - 7.□ Others (Please circle)
     - A. Fisherman with a dealer license
     - B. Restaurant
     - C. Retail store
     - D. Supermarket .
     - E.Other: Specify:_____

2. What is the ownership type that best describe your seafood business?
   1.□ Sole ownership 2.□ Corporation 3.□ Parternship
3. How long have the present owner(s) owned the seafood business? _____ Years
4. How long has this seafood business existed, whether or not under the present ownership? __Years
5. Does the seafood business own any fishing vessels directly or through subsidiaries? 1.□Yes 2.□No
6. Does your seafood business have multiple locations? 1.□ Yes 2.□ No
   If yes, how many? _____

7. How many people does your seafood business currently employ in the following categories?

Support staff (manager, secretary, etc.)	____
Full-time employees	____
Part-time employees	____
Unpaid family members (including the owner)	____

8. Of these total employees, what percents are in the following categories?
(Please keep in mind the percentages for all categories should add up to 100).

White or Caucasian	_____%
African-American	_____%
Hispanic or Latino	_____%
Asian or Pacific Islander	_____%
Others	_____%

B. ISSUES FACING THE INDUSTRY

9. What are the problems facing commercial fishing industry in North Carolina? Rank them on a scale of 1-4, with 1 being very important, 2 being important, 3 being somewhat important and 4 being not important from the following list.

_____ Government regulations/record keeping requirements
_____ Hazard Analysis Critical Control Point (HACCP)
_____ Competition from other seafood dealers
_____ Competition from imported seafood (primary sources: _____)
_____ Weather
_____ Inability to obtain adequate financing
_____ Increased costs of inputs (Specify: _____)
_____ Adequate supply of seafood
_____ Marketing
_____ Labor problems
_____ Production problems
_____ Transportation/delivery problems
_____ Changing market patterns (Please explain:_____)
_____ Other (Specify:_____)

10. Do you have any suggestions to improve your seafood marketing activities? 1.□Yes 2.□ No
If Yes, please provide a detailed discussion of your response.

11. Do you think your needs and expectations for your fishing occupation are being met or addressed by fishery agencies (i.e., Division, Marine Fisheries Commission, and National Marine Fisheries Service)? 1.□ Yes 2.□ No
Please explain why your needs and expectations have or have not been met.

C. FINANCIAL INFORMATION

12. Please indicate the range of your fish business' **<u>gross total sales</u> in 1999**.

1.□ $30,000 or less	7.□ $1 Million-$2 Million
2.□ $30,001-$50,000	8.□ $2 Million-$5 Million
3.□ $50,001-$100,000	9.□ $5 Million-$9 Million
4.□ $100,001-$200,000	10.□ $10 Million and over
5.□ $200,001-$500,000	11.□ Refused/Don't know
6.□ $500,001-$1Million	

13. Please indicate your primary markets by the **percentage of your total sales in 1999**:

Retail	_____%
Other dealers, restaurants, etc. in NC	_____%
Out-of-state markets (U.S. dealers)	_____%
Export (Japan, Europe, etc.)	_____%
Total	100%

14. Please indicate primary species handled as a percentage of the **total sales in 1999**.

Species	**Percent of total sales in**
Shrimp	%
Croaker	%
Flounder	%
Weakfish (Gray trout)	%
Mullets	%
Hard crabs	%
Soft crabs	%
Spot	%
Others	%
	100%

15. Please indicate your **total operating costs in 1999**. Round all answers to the nearest 100 dollars.

Expense category	**1999 Expenses**
Raw product costs (fish, crabs, etc.)	$
Labor (employees' salaries)	$
Utilities (electricity, telephone, and water)	$
Transportation (shipping)	$
Product packaging materials	$
Additives used in the production process	$
Others	$

16. Please indicate the total expenses associated with the following categories during 1999. Round all answers to the nearest 100 dollars.

Expense category	**1999 Expenses**
Insurance	$
Repair and maintenance for plant and equipment	$
Professional fees (accounting, legal, bookkeeping, tax filing, etc.)	$
Loan payment (principal and interest)	$
Permits, licenses, and fees	$
Administrative salaries and benefits	$
Building rental or depreciation	$
Equipment lease or depreciation	$
Miscellaneous/other	$
Property and local (non-income) taxes	$

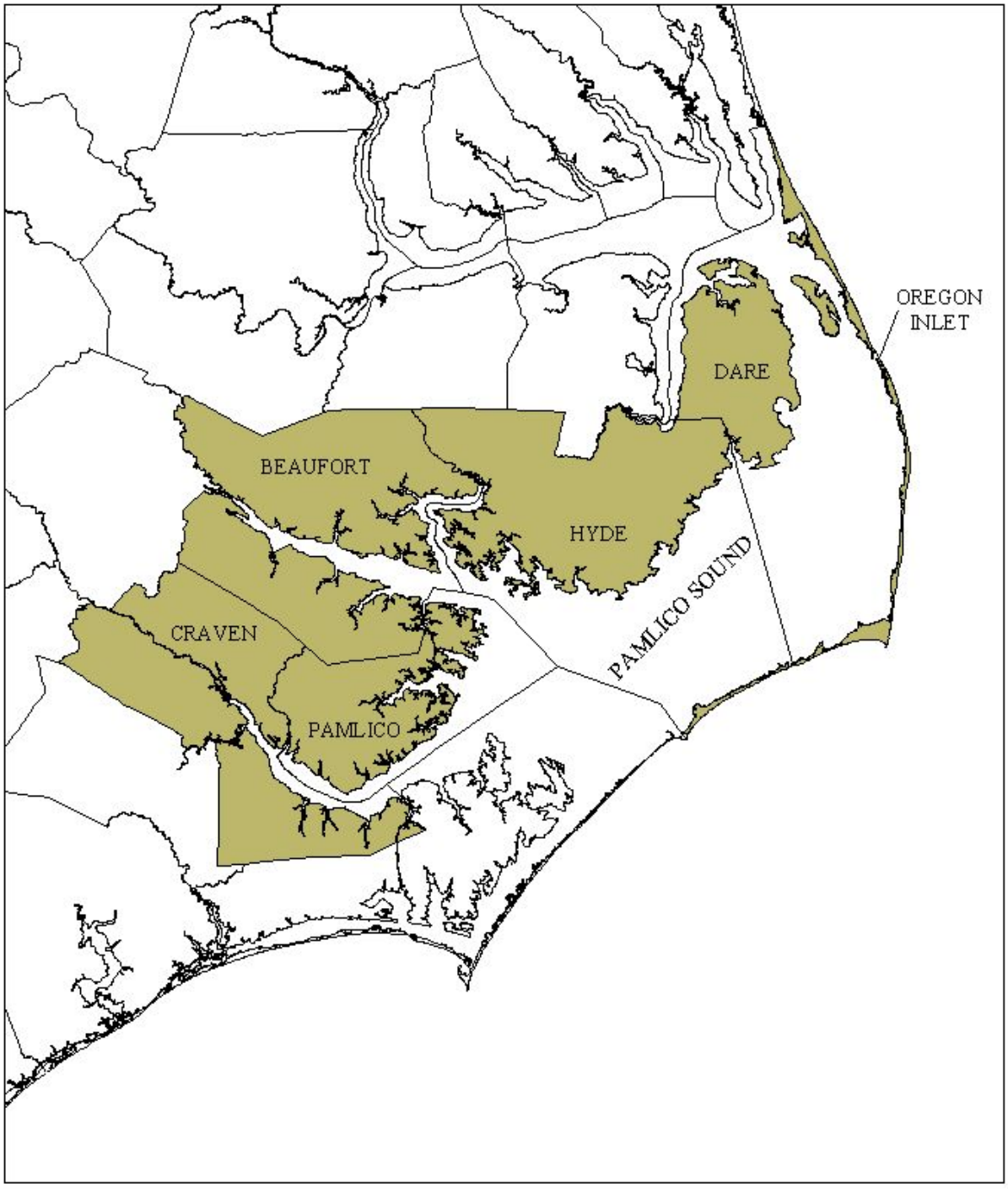

Figure 1. Pamlico Sound Area, North Carolina

N

NAD83
NC State Plane
November 26, 2001

North Carolina
MARINE
FISHERIES

Figure 2. Age distribution of commercial fishermen

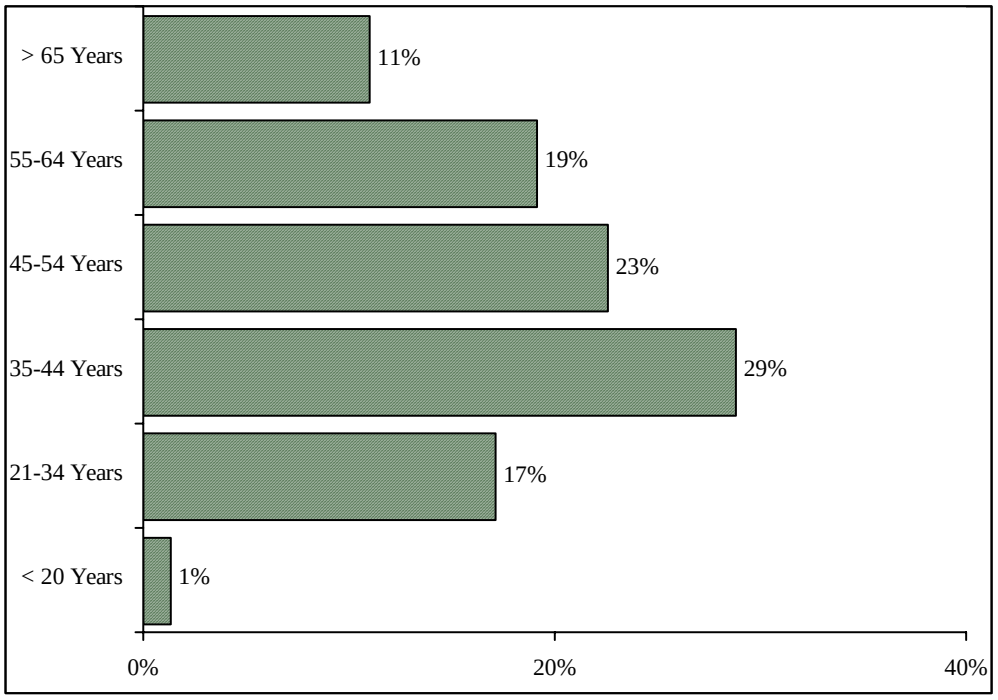

Figure 3. Years of experience of commercial fishermen

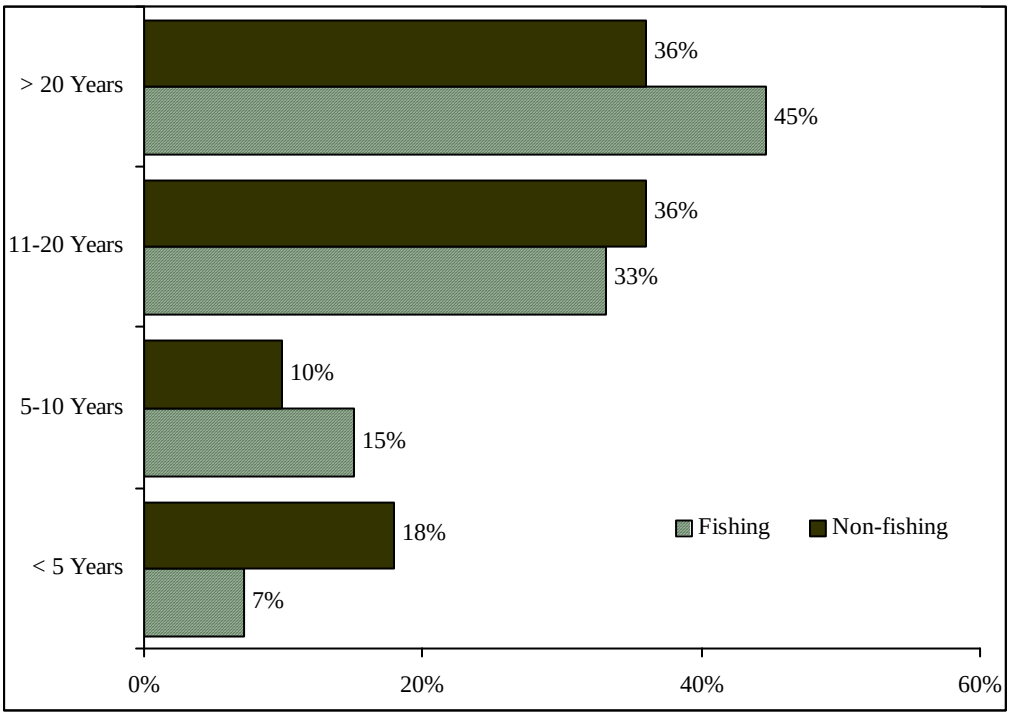

Figure 4. Gender of commercial fishermen

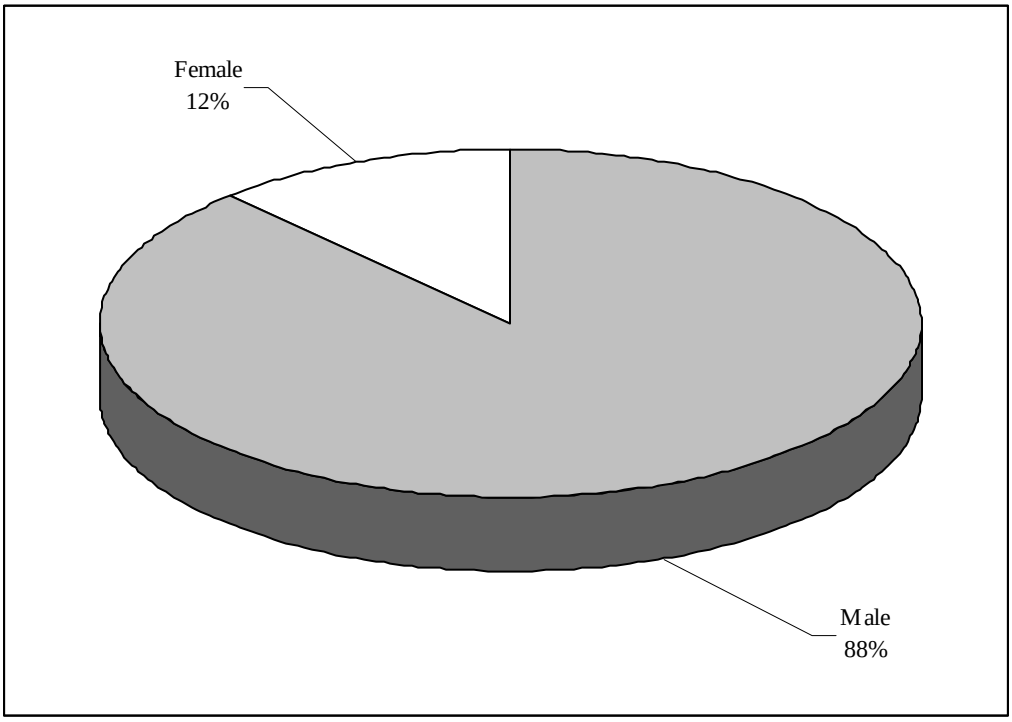

Figure 5. Marital status of commercial fishermen

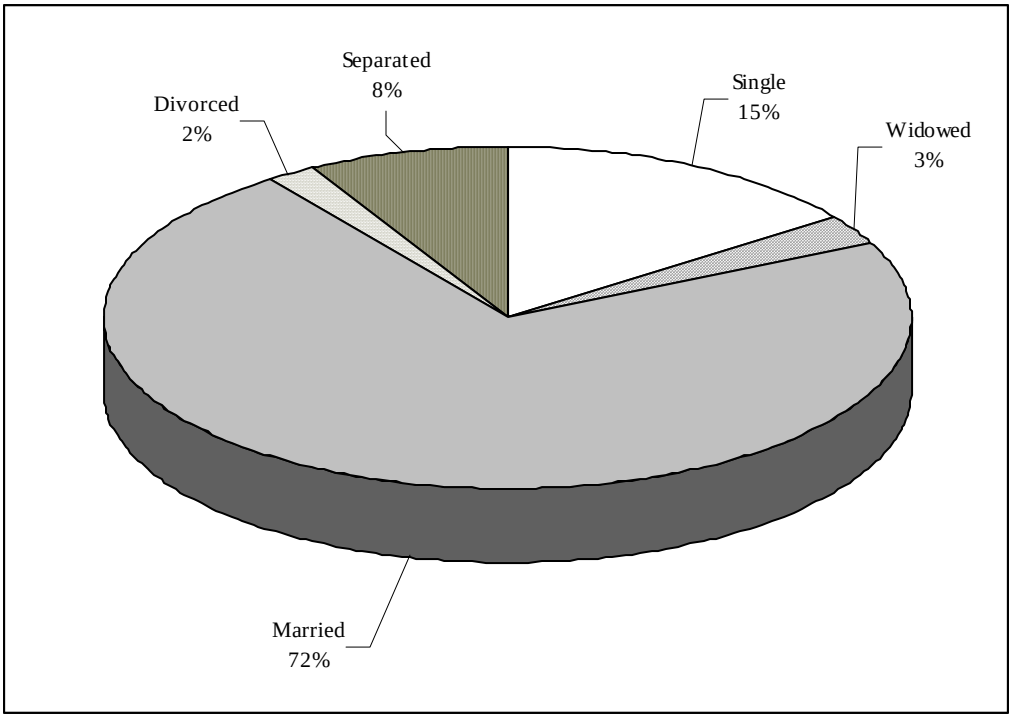

Figure 6. Ethnicity of commercial fishermen

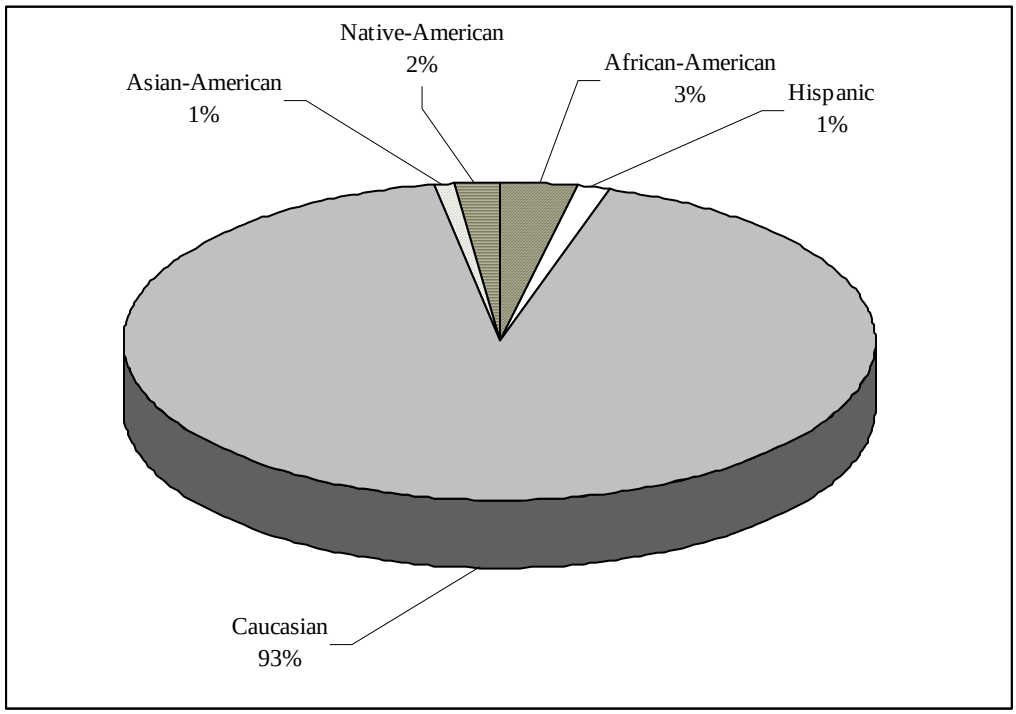

Figure 7. Education level of commercial fishermen

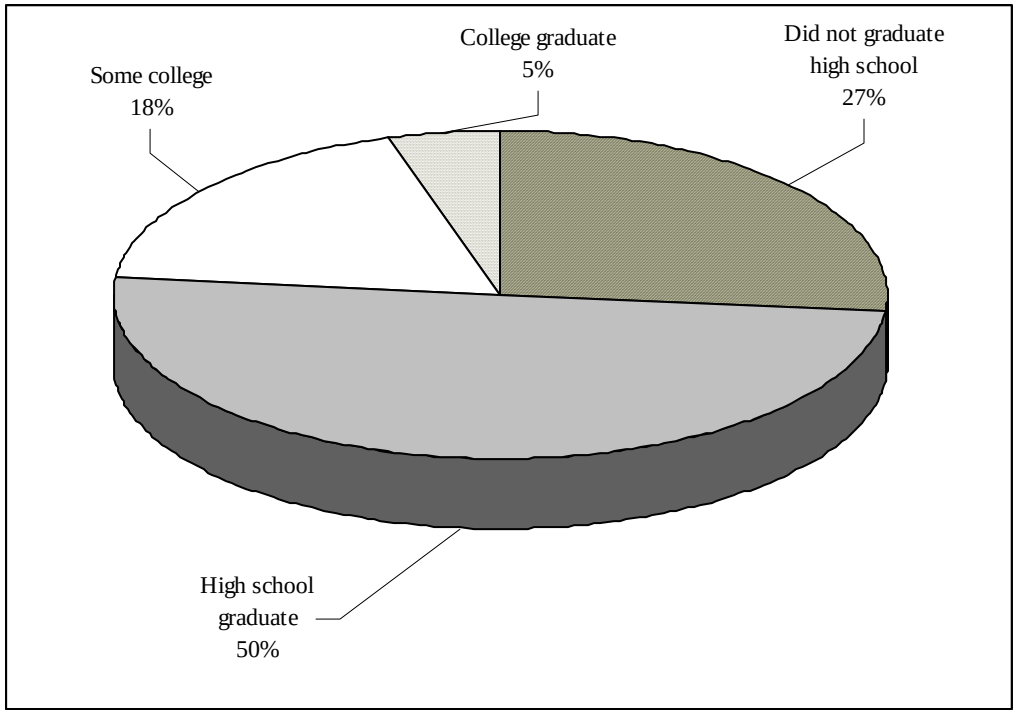

Figure 8. Household income of commercial fishermen

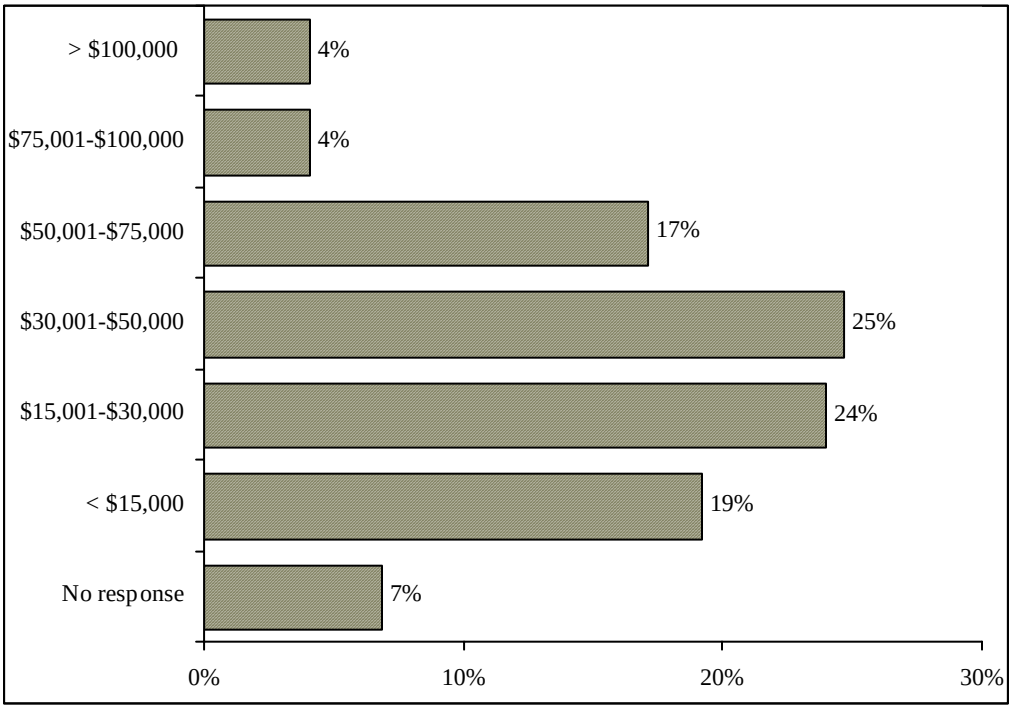

Figure 9. Percent of household income from commercial fishing

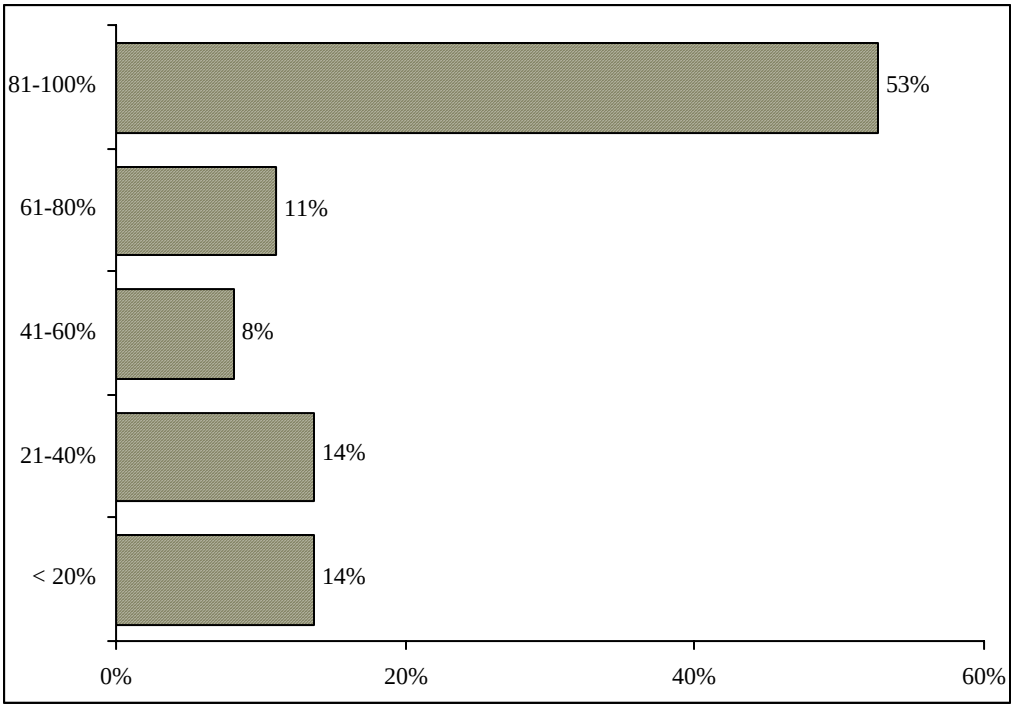

Figure 10. Percent of total fishing trips by water body, by fishing gear type, 1999

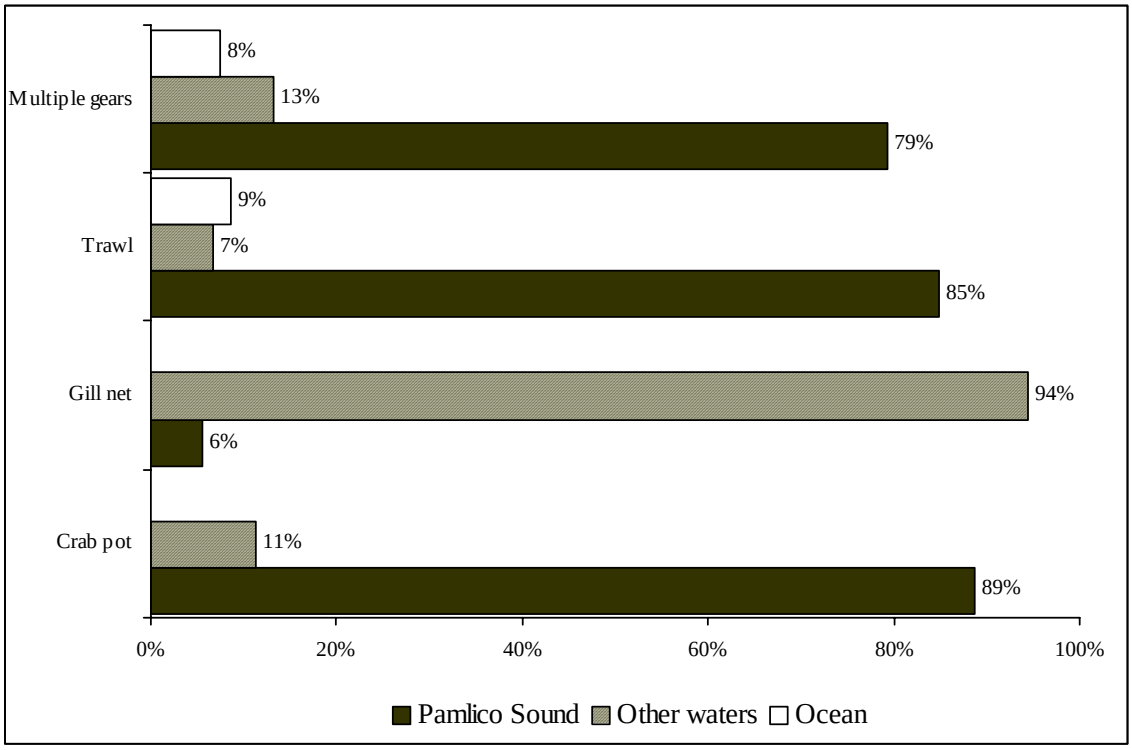

Figure 11. Precent of total revenues by major species, by fishing gear type, 1999

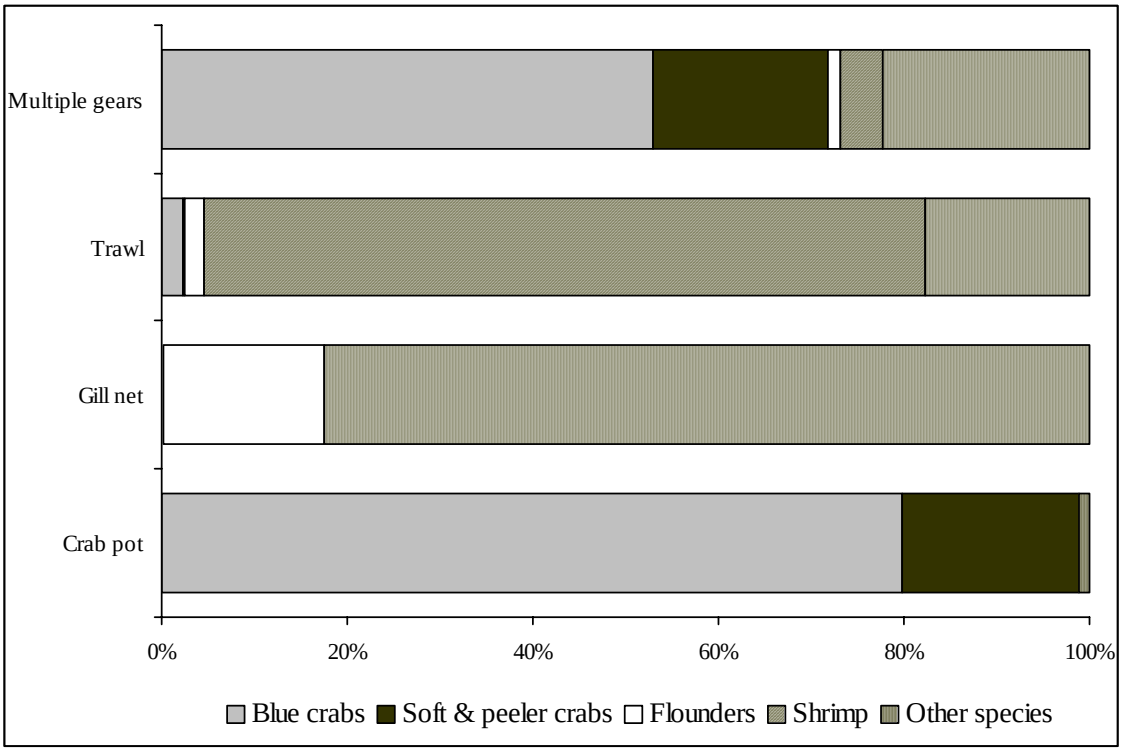

Figure 12. Seafood dealer business types

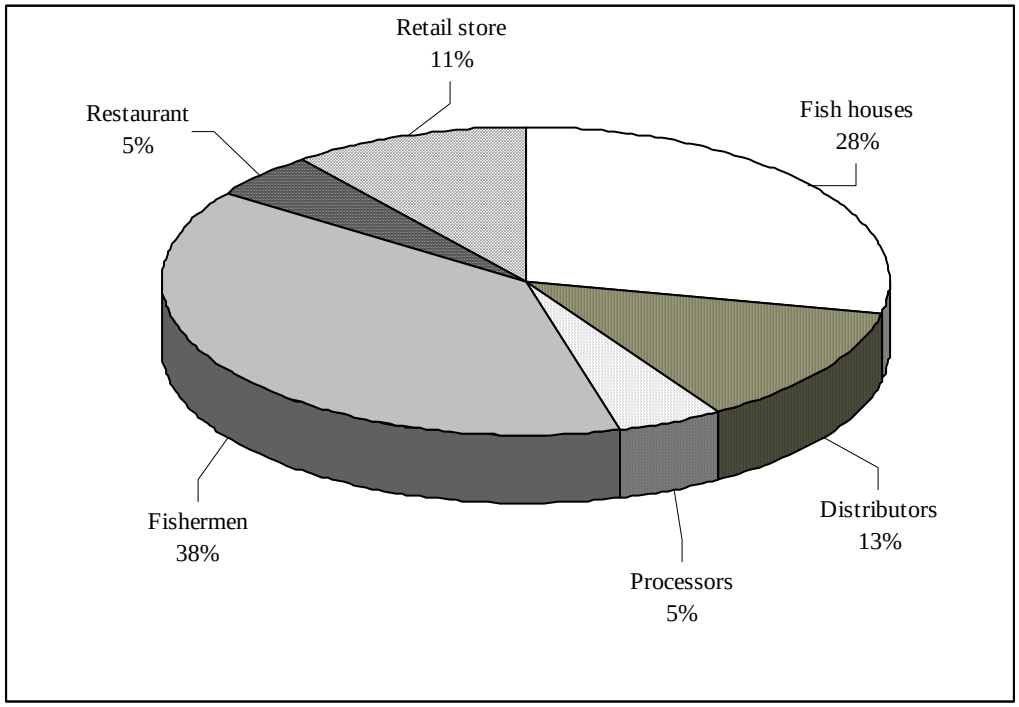

Figure 13. Ownership types of seafood dealer businesses

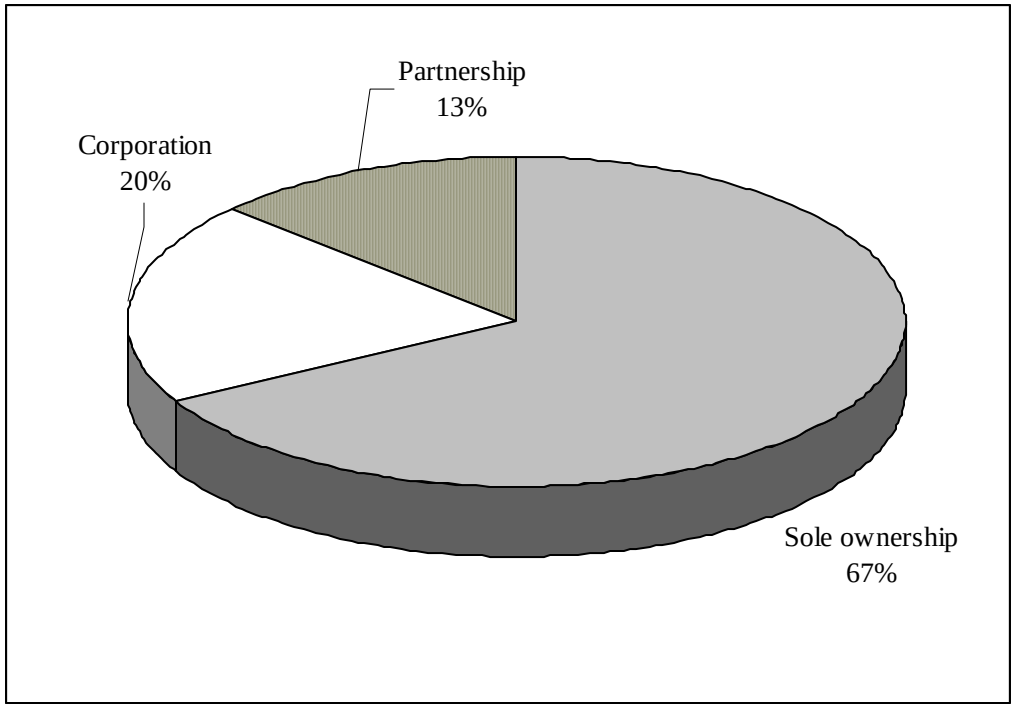

Figure 14. Years of ownership and in business of seafood dealers

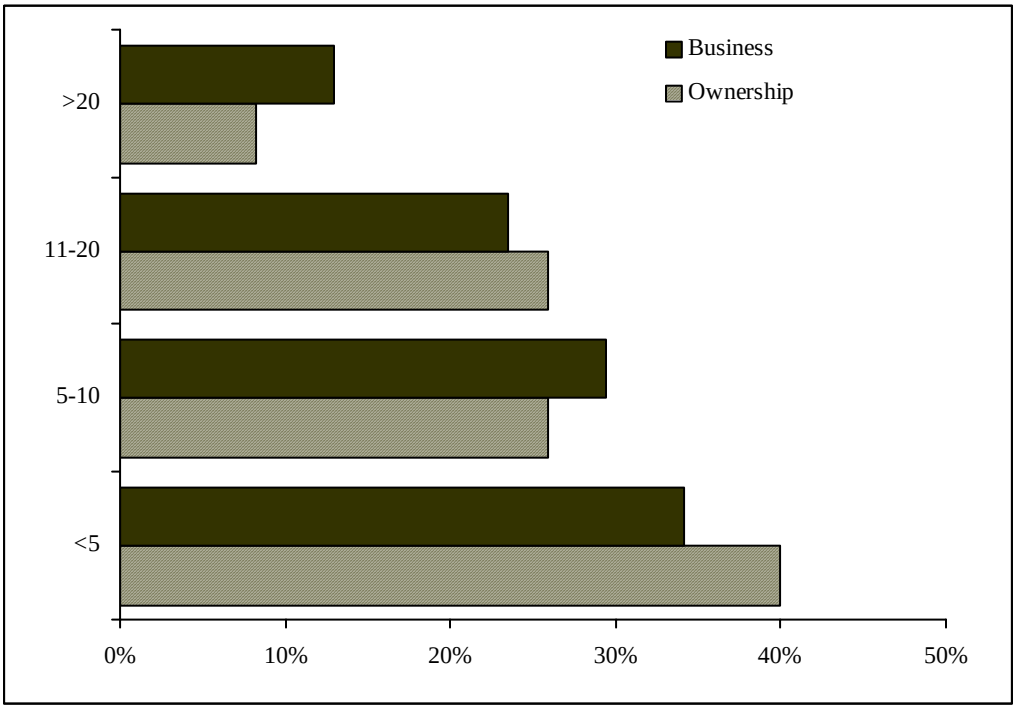

Figure 15. Employment profile of seafood dealer businesses

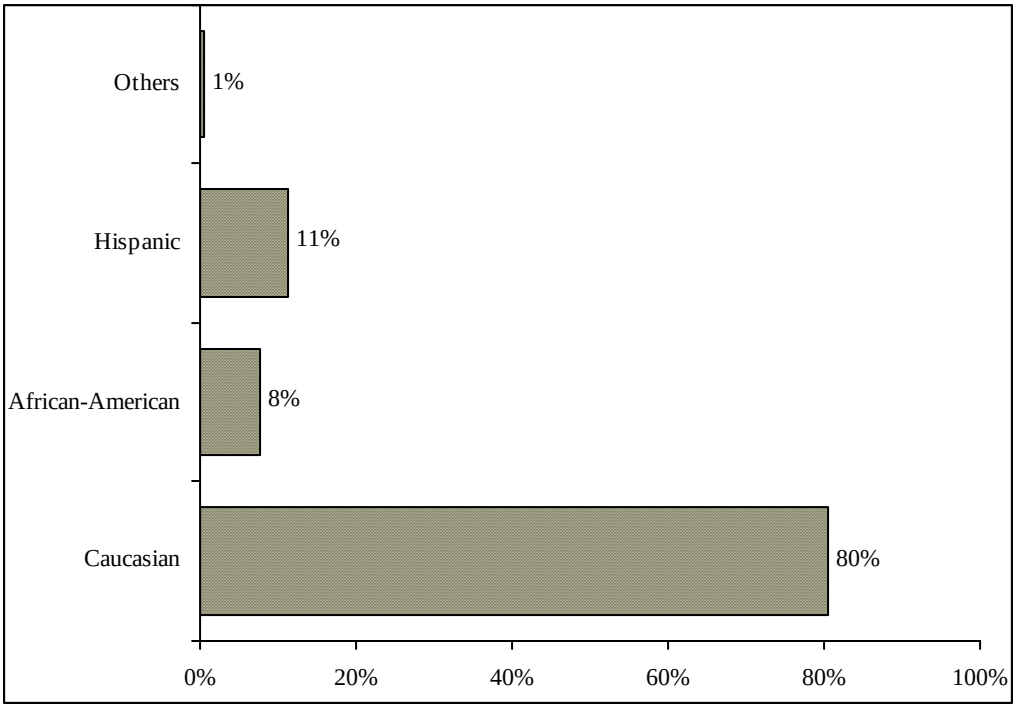

Figure 16. Distribution of seafood dealer businesses by purchases class, 1999

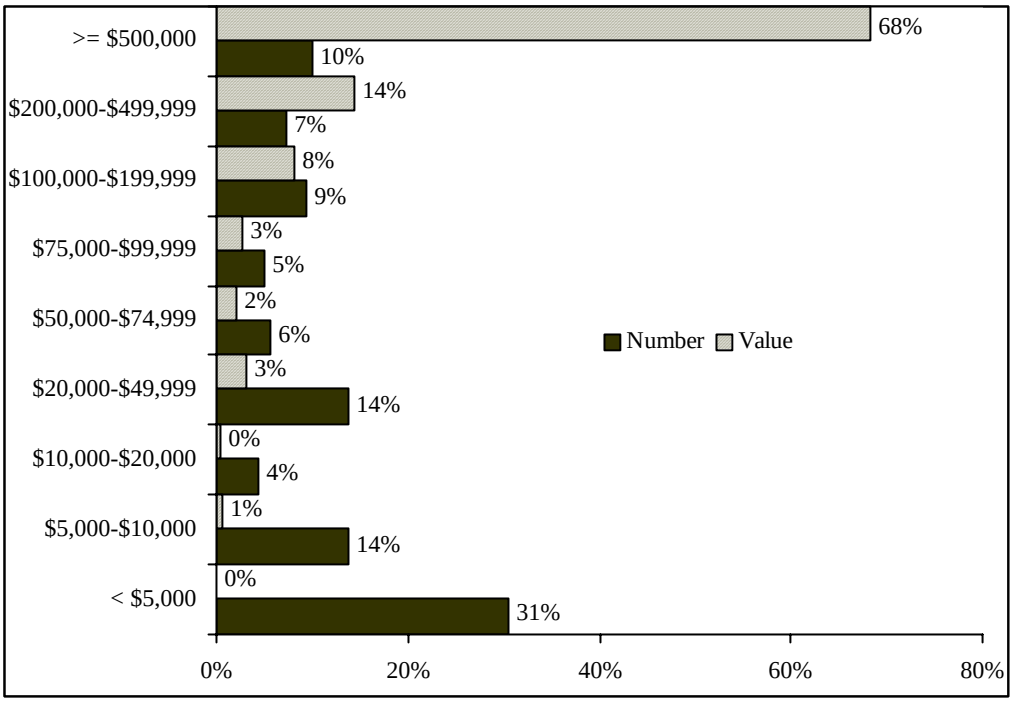

Figure 17. Distribution of seafood dealer businesses by sales class, 1999

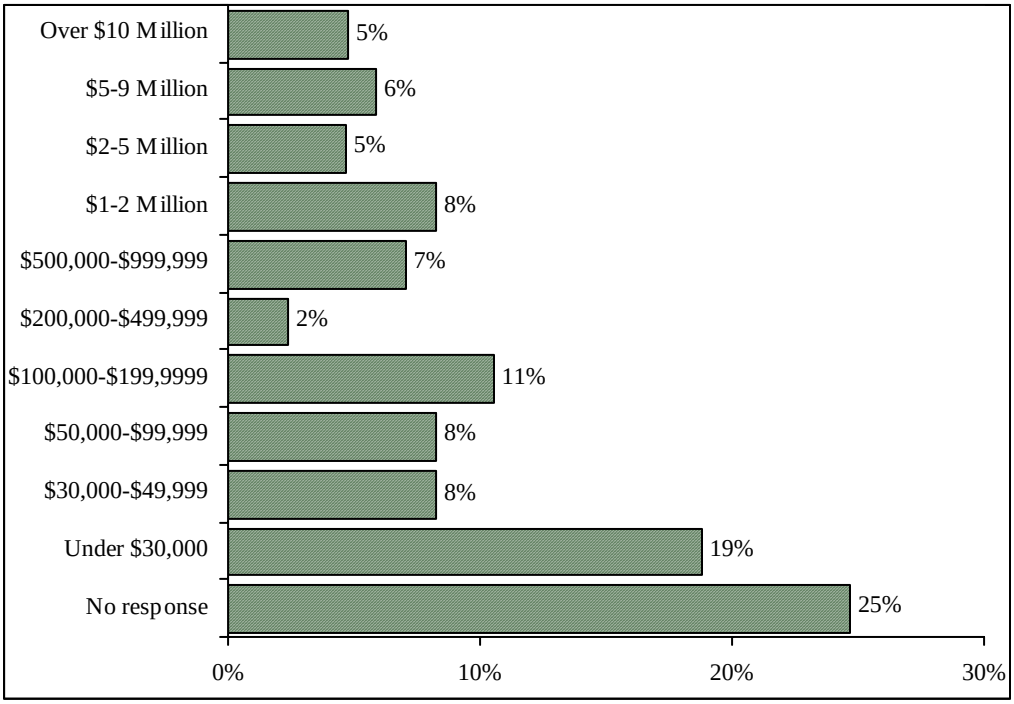

Figure 18. Seafood dealer businesses sales by major species, 1999

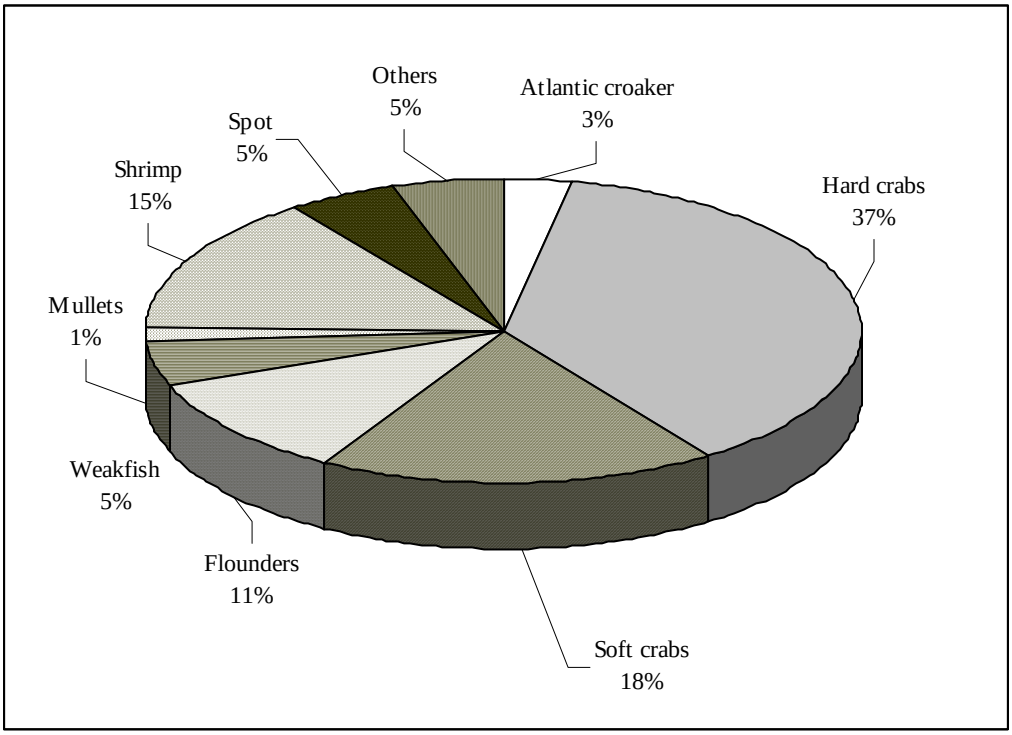

Figure 19. Seafood dealer businesses sales by major markets, 1999