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SYNTHESIS OF SEAFOOD CATCH, DISTRIBUTION, AND CONSUMPTION PATTERNS IN THE GULF OF MEXICO REGION

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Jupiter, Florida

National Petroleum Technology Office
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Synthesis of Seafood Catch, Distribution, and Consumption Patterns in the Gulf of Mexico Region

By
Steimle & Associates, Inc.

July 1999

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Prepared for
U.S. Department of Energy
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ABSTRACT

The purpose of this task was to gather and assemble information that will provide a synthesis of seafood catch, distribution and consumption patterns for the Gulf of Mexico (GOM) region. This task was part of a U.S. Department of Energy (DOE)-sponsored project entitled "Environmental and Economic Assessment of Discharges from Gulf of Mexico Region Oil and Gas Operations." Personal interviews were conducted with a total of 905 recreational fishermen and 218 commercial fishermen (inclusive of shrimpers, crabbers, oystermen and finfishermen) in Louisiana and Texas using survey questionnaires developed for the study. Results of these interviews detail the species and quantities caught, location of catch, mode of fishing, distribution of catch, family consumption patterns and demographics of the fishermen.

A total of 95 wholesaler/processors completed and returned surveys by mail which delineate the location of seafood sources, the quantities of seafood handled, the distribution of the product to consumers and the form of the product sold. Products available and the form in which the products were available was determined in 341 retail outlets near population centers in coastal Louisiana and Texas.

Restaurant surveys were conducted by mail to determine the popularity of seafood dishes sold, the source of the seafood and the cooking methods. One hundred fifty-four restaurants from Louisiana and Texas responded.

Data quality was analyzed by means of analysis of variance to confirm that survey information obtained concerning finfish species was consistent both within and among surveys.

The study concluded that over the two state area surveyed, a large percentage of seafood was harvested commercially and recreationally near inshore and offshore oilfield structures. This was particularly true in Louisiana. Seafood harvested by commercial fishermen was most often sold to wholesaler/processors who ship the seafood with little value added to retail outlets and restaurants.

Retail outlets provide mostly uncooked seafood to the general public. Restaurants which serve seafood do so as a large percentage of their meals. Most of the seafood is fried although seafood stock is in a large percentage of dishes.

Seafood harvested by recreational fishermen was usually kept for home consumption and prepared fried. Most of the seafood harvested locally, both commercially and recreationally, remains in the local population. Very little fresh seafood sold locally was imported from out of state or out of country.

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This task is part of a U.S. Department of Energy (DOE)-sponsored project entitled "Environmental and Economic Assessment of Discharges from Gulf of Mexico (GOM) Region Oil and Gas Operations." The objective of this project is to increase scientific knowledge about the fate and effects of contaminants found in produced water. This task was intended to detail the seafood catch, distribution and consumption patterns for the GOM region.

ES.2 METHODOLOGY

A thorough review of the literature revealed significant gaps in the existing information necessary to determine the catch, consumption and use patterns in the GOM region. Surveys were therefore developed to obtain the pertinent information from commercial fishermen, recreational fishermen, processors, wholesalers, retail outlets and restaurants in Louisiana and Texas.

Commercial fishermen (including oystermen) and recreational fishermen were surveyed by personal interview. Wholesalers and processors were surveyed by personal interview and by mail. Retail outlets were surveyed by site visits, and restaurants were surveyed by mail. All personal interviews and site visits were conducted by FISHIE (Fisheries Information and Seafood Harvest Inquiry Enterprise), a nonprofit organization who conducted the surveys.

Commercial fishermen (shrimpers, crabbers and finfishermen) and recreational fishermen were surveyed from May through November 1993 to determine categories of seafood fished over the previous three months, types of license(s) held, and information on the number, gender and ages of individuals in the household and their seafood consumption habits. Respondents were also interviewed about locations fished, the estimated distance from oilfield structures and species caught. An identification guide with fish illustrated in color was shown to respondents to enable them to correctly identify species. Recreational fishermen were additionally asked about fishing mode (i.e., private boat, party boat, charter boat).

To determine the distribution of the catch, all fishermen were asked to estimate by species the percentage sold, the percentage given away to others and the percentage kept for personal consumption. Fishermen were also asked to estimate frequency of seafood consumption and cooking methods employed.

Oystermen surveys were conducted during April and May 1994 in Louisiana and Texas. Oystermen were asked for the number of acres of oyster bottoms under lease in addition to the questions asked other commercial fishermen.

Processing plants and wholesalers were surveyed in Louisiana and Texas from June through December 1993. The survey questions referred to a 12 month period of 1 January through 31 December 1992. These entities were surveyed to determine their sources of seafood (i.e., in-state vs. out-of-state) and the origin of the seafood sold (i.e., fishing zones and ports of commercial fishermen). They were further asked to estimate the relative percentage of commercial fishermen suppliers fishing inshore and offshore. Respondents were also asked to estimate percentage of commercial fishermen suppliers fishing near oilfield structures both inshore and offshore.

Processors and wholesalers were requested to estimate the quantity of seafood handled through the year and the distribution of the seafood by species (i.e., in-state vs. out-of-state). Respondents were also asked to identify the most commonly sold form of seafood.

Site surveys of seafood retailers were conducted May through November 1993 to determine the types of shellfish and saltwater finfish sold, the parts of the seafood sold and the types of prepared seafood sold. Retailers were also asked if they shipped seafood to other areas of the state or out-of-state.

Restaurant surveys were conducted during the calendar year 1992. Respondents were asked to provide information concerning the source, quantities and method of preparation of seafood sold/served by the restaurant.

ES.3 DATA QUALITY ANALYSIS

A data quality analysis was performed on the finfish information from all surveys. Finfish information was used because it was common to all surveys. The objective of the analysis was to determine whether survey information concerning finfish species was consistent within and among surveys.

Analysis of variance (randomized block design) was used on the Louisiana recreational fishermen data (transformed) and the Texas recreational fishermen data (transformed) to determine if similar finfish species were caught in the geographic zones in the surveys. In both cases, the differences were not significant between zones.

Analysis of variance was also used on nine data sets from the ten surveys. The Louisiana and Texas commercial fishermen data were pooled because of a lack of data from Texas commercial finfishermen. The analysis was to determine whether there was consistent reporting concerning the finfish species among the surveys. There were not significant differences among the nine data sets in species reported.

Finfish catches reported by commercial and recreational fishermen are therefore representative of finfish availability in retail markets and restaurants.

ES.4 RESULTS

Louisiana Recreational Fishermen Survey

The survey organization, FISHIE, interviewed approximately 0.21% of all individuals in the state holding salt water fishing licenses.

Finfishing was the most popular form of recreational fishing (95%) with most fishermen possessing an in-state license (92%). The majority of respondents were white (92%), fished from a private boat inshore (62%), often near an oilfield structure, and most commonly caught speckled trout and red snapper.

Fishermen reported keeping 80% of finfish, 97% of blue crab catch and 83% of shrimp for personal consumption. They reported serving the seafood 1.8 times per week. Their preference was to consume the meat only from the fish over 90% of the time, and the most popular cooking method was frying (30%).

Texas Recreational Fishermen Survey

FISHIE interviewed approximately 0.06% of all individuals in the state holding salt water fishing licenses. Finfishing was the most popular form of recreational fishing (97%) with most fishermen possessing

an in-state license (93%). The majority of the respondents were white (93%), fished from a private boat inshore (45%) or offshore (42%), often near an oilfield structure (33%) and most commonly caught red snapper.

Fishermen reported keeping 70% of finfish, 100% of blue crabs and 62% of shrimp for personal consumption. They reported serving seafood 1.6 times per week. Their preference was to consume meat only (73% to 84% of the time) from the fish and the preferred method of cooking was frying (31%).

Louisiana and Texas Commercial Fishermen Survey

Approximately 0.6% of the total individuals holding commercial fishing licenses in Louisiana and Texas were interviewed by FISHIE. The Louisiana and Texas fishermen profiled fish shrimp (77%), finfish (12%), crabs (8%) and oysters (4%). The majority of respondents were white (65%) and fished largely inshore (39%). Thirty-three percent of all trips were made within 300 m (1,000 ft) of an oilfield structure. The majority of seafood caught was sold to either wholesaler/processors or retailers/restaurants.

Louisiana Oyster Fisherman Survey

FISHIE interviewed approximately 1.6% of all individuals holding a license for oyster fishing. The Louisiana oyster fisherman profiled in this survey leased an average of 1,164 acres of water bottoms from the state for oyster culture. Most respondents were white (91%), and 99% of all oysters fished were sold to wholesaler processors. Oysters were served in the household an average of three times per week, and the most popular method of preparation was frying (30%). For the oysterman himself, the most popular method of preparation was raw (49%).

Texas Oyster Fisherman Survey

Eleven licenses were issued to oystermen in Texas, and FISHIE interview 16 oystermen. The average number of acres of water bottom leased by the Texas oyster fisherman profiled could not be determined due to insufficient responses. Most respondents were of Hispanic origin (60%), and 100% of all oysters fished were sold to wholesaler/processors. Oysters were served in the fisherman's household 2.3 times per week on average and the most popular method of preparation was frying (36%). For the oysterman himself, the most popular method of preparation was raw (42%).

Louisiana Wholesalers and Processors Survey

The response rate was 24.7% for the wholesaler/processors surveyed in Louisiana. Of the survey respondents, 52% operate as a wholesaler/dealer only and 42% function as wholesalers and processors. The typical source of seafood was in-state commercial fishermen with generally more than 33% of the seafood received from this source. Respondents indicated that their sources of seafood fished inshore and offshore. Of those sources who fished inshore, 56% were reported to fish near and oilfield structures, and 72% of those who fished offshore were reported to fish near oilfield structures.

The average quantity of saltwater finfish received by respondents was 307,600 kg (678,141 lb) of whole fish, 605,624 kg (1,335,173 lb) whole shrimp (heads-on), 224,200 kg (494,717 lb) of hard shell blue crabs and 486,150 sacks of oysters. The Louisiana wholesalers/processors sent less than 33% of their shellfish out-of-state. Twenty-five percent of black drum, flounder, red snapper and speckled trout and 40% of vermilion snapper were sold to out-of-state sources.

The seafood was sold in a variety of forms. Oysters were most often sold shucked (55%). Blue crabs were sold whole (47%) and shrimp were sold heads-on (32%). Over 55% of finfish were sold whole.

Texas Wholesalers and Processors Survey

Response rate was 5.0% of all Texas wholesalers/processors. Of the survey respondents, 53% operate as a wholesaler/dealer only, and 41% function as wholesalers and processors. The typical source of seafood was in-state commercial fishermen with generally more than 25% of the seafood received from this source. Respondents indicated that their sources of seafood fished inshore and offshore. Of those sources who fished inshore, 30% were reported to fish near oilfield structures, and 54% of those who fished offshore were reported to fish near oilfield structures.

The average quantity of saltwater finfish received by respondents was 24,479 kg (53,967 lb) of whole fish and 105,746 kg (233,130 lb) whole shrimp (heads-on). Few responses were received regarding hard shell blue crabs and oysters. The Texas wholesalers/processors sent less than 30% of their shellfish out-of-state. Nine percent of flounder and red snapper and 25% of tuna were sold to out-of-state sources.

The seafood was sold in a variety of forms. Oysters were most often sold in the shell (54%). Blue crabs were sold whole (50%) and shrimp were sold heads-on (33%). Over 60% of finfish were sold whole.

Louisiana Retail Seafood Market Survey

FISHIE personnel surveyed products at 226 retail outlets in or near population centers in coastal Louisiana parishes. Shellfish (blue crabs, oysters and shrimp) were sold uncooked more than 50% of the time. Finfish were sold as whole fish (gutted) and fillets. None of the markets surveyed sold fish parts. Only flounder (1.2%), speckled trout (3%) and a few miscellaneous species were sold cooked.

Shipping of seafood products was generally to other parts of the state (33%). About 23% reported that they shipped seafood out-of-state.

Texas Retail Seafood Market Survey

FISHIE personnel surveyed products at 115 retail outlets in or near population centers in coastal Texas counties. Most shellfish were sold uncooked. Most fish were sold as whole fish. Both tuna (15%) and grouper (13%) were sold as fish parts. Most fish were sold uncooked although some speckled trout (24%), black drum (11%), flounder (5%), red snapper (4%), and sheepshead (4%) were sold cooked.

Shipping of seafood products was generally to other parts of the state (18%). About 8% of respondents reported that they shipped seafood out-of-state.

Louisiana Restaurant Survey

Seventy-nine questionnaires were received completed from the 1,500 mailed (5.3%). Results showed that an average of 1,096 seafood dishes were served each week in 1992 among responding restaurants. Of the seafood dishes served in 1992, 48% consisted of shellfish, 46% involved finfish and 29% contained both shellfish and finfish. Shrimp was the most popular shellfish (52%), and the most common finfish was tuna (29%). Many restaurants used stock in the preparation of their meals.

About 31% of seafood was imported from out-of-state sources. Wholesaler/processors provided about 86% of the seafood served. Over 60% of finfish were served meat only, and the most common method of preparation was fried (18%).

Texas Restaurant Survey

Seventy-five questionnaires were received completed from the 1,500 mailed (5.0%). Results showed that an average of 678 seafood dishes were served each week in 1992 among responding restaurants. Of the seafood dishes served in 1992, 55% consisted of shellfish, 45% involved finfish and 36% contained both shellfish and finfish. Shrimp was the most popular shellfish (74%), and the most common finfish was red snapper (31%). Many restaurants used stock in the preparation of their meals.

About 62% of seafood was imported from out-of-state sources. Wholesaler/processors provided about 91% of the seafood served. Over 58% of finfish were served meat only, and the most common method of preparation was fried (22%).

ES.5 DISCUSSION

Recreational fishermen in Louisiana and Texas reported they prefer to fish for finfish, keep their catch and infrequently serve it in their household. When their catch was served, it was usually filleted, skinned and fried. Louisiana recreational fishermen more commonly fish near oilfield structures than Texas recreational fishermen.

Commercial fishermen interviewed, primarily shrimpers, sell the vast majority of their catch. Texas and Louisiana commercial fishermen reported commonly fishing near oilfield structures. Louisiana oyster fishermen also report commonly developing oyster beds in closer proximity to oilfield structures than their counterparts in Texas.

In-state commercial fishermen were the prime suppliers of seafood to Louisiana and Texas wholesalers/processors, and wholesalers/processors in both states report that their commercial suppliers often fish in close proximity to oilfield structures. Louisiana wholesalers/processors handled significantly more seafood than those in Texas. Wholesalers/processors were the main source of seafood to restaurants and retailers in both states.

Both Louisiana and Texas restaurants reported similar consumption patterns. For each state shellfish dishes were more popular than finfish dishes or a combination of the two. The preferred method of seafood preparation was fried as reported by all fishermen and restaurants.

ES.6 CONCLUSIONS

Over the two state area surveyed, a large percentage of seafood was harvested commercially and recreationally near inshore and offshore oilfield structures. This was particularly true in Louisiana. Finfish species whose reported catch frequencies were at least 50% greater in close proximity to oilfield structures included amberjack, grouper, king mackerel, red snapper, shark and vermilion snapper. Seafood harvested by commercial fishermen was most often sold to wholesalers/processors who ship the seafood with little value added to retailers and restaurants.

Retail outlets provide mostly uncooked seafood to the public. Restaurants which serve seafood do so as a large percentage of their total meals served. Fresh seafood served to consumers was most often fried, and seafood stock was often used in the preparation of seafood dishes.

Seafood harvested by recreational fishermen was most often kept for home consumption and prepared fried. Most of the seafood harvested locally, both commercially and recreationally, remains in the local population.

1.0 INTRODUCTION

1.1 Purpose of the Task

This task was completed as part of a U.S. Department of Energy (DOE)-sponsored project entitled "Environmental and Economic Assessment of Discharges from Gulf of Mexico Region Oil and Gas Operations." The objective of the project is to increase scientific knowledge on the fate and effects of contaminants found in produced water and to increase knowledge on the economic impacts of proposed regulations on offshore oil and gas producers in the Gulf of Mexico (GOM) region. Additionally, the project was implemented to detail the catch, consumption and human use patterns of seafood collected from coastal and offshore waters of the GOM. These data are provided for input into a human health risk analysis to be conducted by Brookhaven National Laboratory.

The specific purpose of this task was to gather and assemble information that will provide a synthesis of seafood catch, distribution and consumption patterns for the GOM region. The task results provide a description of market availability of finfish and shellfish species caught in onshore and offshore Louisiana and Texas near oilfield operations. Results also provide an estimate of the amount of seafood harvested by recreational and commercial fishermen which becomes food locally and out-of-state through wholesalers/processors, retail outlets and restaurants. It also profiles the personal consumption patterns of seafood by fishermen and their families.

1.2 Objectives of the Task

The overall objective for this task was to identify the edible seafood catch, distribution and consumption patterns in the GOM region. In meeting this objective, a detailed review of pertinent literature and descriptive field surveys were conducted. Specifically, this task addressed the following questions:

- What seafood species are caught?
- Where are the seafood caught?
- What quantities of seafood are caught?
- How was the seafood distributed to the consumer?
- What seafood species are consumed/utilized?
- With what frequency was seafood served/eaten?
- What specific parts of the seafood are consumed/utilized?
- What cooking methods are used?
- What was the demographic profile of the fishermen's household?

1.3 Limitations of Study

The limitations of this study include the following:

- The primary target population for this study was fishermen who had the ability to fish near produced water discharge locations. The recreational fishermen respondents were, therefore, limited to those who fished from boats;

- The majority of the surveys of fishermen and wholesalers/processors were conducted during the period May through November 1993, representing the peak fishing activity in Louisiana and Texas. Surveys of retailers were conducted during the period March through August 1993. Restaurant surveys were collected from July to December 1993, and oystermen surveys were conducted during April and May 1994;

- Intercept surveys were conducted during daylight hours, excluding night fishermen;

- Only restaurants in Louisiana and Texas that served fresh seafood were included in this study. This excluded such establishments as fast food chains which utilize frozen, packaged seafood;

- For the purpose of identifying the distribution patterns of seafood, seafood processing plants and seafood wholesalers were combined into one survey. Some operations function both as processing plants and as wholesale outlets; and

- Produced water discharges are not always evident to the recreational or commercial fisherman, therefore, the survey questioned only the nearness of the fisherman to oilfield structures. This assumes that all oilfield structures have produced water discharges, a very conservative assumption.

1.4 Special Terms and Definitions

The following terms are the operational definitions specific to this study.

- Commercial Fishermen: Commercial fishermen are those individuals who make their living or supplement family income by fishing and selling those portions of their catch of commercial value. Commercial fishermen are shrimpers, crabbers, oystermen and finfishermen;

- Oilfield Structure: This term refers to any type of offshore and inshore platform, tank battery, wellhead or facility;

- Oystermen: Oystermen lease water bottoms along the coastal areas of Louisiana and Texas for the primary purpose of growing and harvesting oysters for wholesale or retail outlets;

- Processing Plant: These are sites where seafood is prepared for market. Preparations may include grading, filleting, shelling, shucking, picking, packaging and/or quick freezing;

- Recreational Fishermen: Recreational fishermen are individuals who fish primarily for enjoyment and personal consumption of catch. Recreational fishermen are those who fish from seawalls, shorelines, private boats in inshore waters, private boats in offshore waters, charter boats and/or party boats;

- Restaurant: A restaurant is a place where meals are cooked and served to the public;

- Retailer: A retail market is a store or outlet for fresh and/or cooked seafood. These markets sell to the final consumers in small quantities;

- Seafood: Seafood includes saltwater finfish, blue crabs, shrimp, and oysters; and

- Wholesaler/Processor: These are providers of seafood products to retailers, restaurants and consumers. Wholesalers generally sell in large quantities.

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2.0 HISTORICAL PERSPECTIVE

Rabalais *et al.* (1991) estimated the amount of produced water discharged into the Outer Continental Shelf (OCS) and inshore coastal waters of Texas and Louisiana at 563 million liters/day (3.45 million bbl/day). A map of discharge locations in inshore and offshore Louisiana and Texas is given in **Appendix A**. This map was plotted using industry data (i.e., gathered for the Offshore Operators Committee) for offshore discharge points. The inshore data was obtained from the Texas Railroad Commission and Louisiana Department of Environmental Quality (LDEQ) as of mid-1992.

Produced waters contain oil, heavy metals, radionuclides, treating chemicals, salt and dissolved oxygen (Stephenson, 1992). These constituents, which vary widely in concentration among produced waters from place to place, have the potential to affect the distribution and survival of aquatic organisms. Accumulation of these constituents by species commonly used for human consumption may also result in health risks.

Hydrocarbons from produced water discharges have been shown to accumulate in sediments. Boesch and Rabalais (1989a) found moderately elevated sediment hydrocarbon levels a maximum of 500 m (1,640 ft) from inshore Louisiana discharges. St. Pe' (1990) found elevated hydrocarbons and Ra^{226} in sediments within 300 m (1,000 ft) of the discharge. Steimle & Associates (1991) found during sampling at 36 produced water locations throughout coastal Louisiana, that 14 sites showed sediment contamination above background levels up to 300 m (1,000 ft) from the discharge.

The accumulation of constituents in the sediments is known to affect species diversity in benthic communities close to shallow water discharges (Middleditch, 1984; Neff, 1987). Neff *et al.* (1989) found elevated total petroleum hydrocarbon concentrations less than 300 m (1,000 ft) from a shallow water discharge and less than 100 m (328 ft) from a deep water discharge. Neff *et al.* (1989) concluded that benthic communities within 20 m (66 ft) of both discharges were influenced by sediment contamination.

The significance of naturally occurring radionuclide concentrations in produced waters discharged to coastal habitats is largely unknown. Kraemer and Reid (1984) studied the geochemistry of radium (Ra) in formation waters from the U.S. Gulf Coast region. Their findings show a direct relationship between the salinity of the produced water and the Ra content.

Hanan (1981) documented a doubling of the Ra^{226} concentration in bottom sediments near a 3.5 million liters/day (22,000 bbl/day) produced water discharge when compared to a nearby control site in a fresh marsh habitat off the mouth of the Mississippi River. In conjunction with Hanan's work, Landa and Reid (1983) demonstrated that the Ra^{226} associated with the sediments from the same study site was associated with the mineral fraction of the sediments, not the organic fraction. This demonstrated that the organic matter is unlikely to provide a pathway into the food chain.

Little data are available on tissue concentrations of hydrocarbons, metals and radionuclides in fish or other edible shellfish collected in the vicinity of shallow water produced water discharges. Neff (1988) reviewed the primarily offshore literature on the bioaccumulation potential of oilfield wastes including produced waters. He found that produced water related hydrocarbons were bioavailable and rapidly accumulated, but they were not persistent in animal tissue and did not generally magnify in marine food webs.

Boesch and Rabalais (1989a,b) collected American oysters *Crassostrea virginica* and the mussel *Geukensia demissa* from near several produced water discharges in coastal Louisiana. Limited tissue data showed clear potential for these bivalves to concentrate produced water associated hydrocarbons from the vicinity of the discharges. The metals data showed smaller differences between near discharge and control samples and no clear trend of accumulation in bivalve tissues.

St. Pe' (1990) studied the accumulation of hydrocarbons and radionuclides in caged oysters placed at three of the discharge locations and one control station. He found elevated hydrocarbon levels in all of the experimental oyster tissues with respect to controls. One of the three composited oyster samples near a produced water discharge showed a detectable Ra^{226} activity.

Although little is known about the accumulation of produced water constituents in edible seafood tissue, one of the stated project objectives was to provide a determination of radionuclide concentrations in fish and shellfish species which spend some of their life in the vicinity of produced water discharges in inshore and offshore Gulf Coast waters. A limited amount of data also exists regarding the availability and personal consumption of seafood along the Gulf Coast. The data reveal the large amounts of seafood available for human consumption after processing and retailing. Species of seafood which are more often found in proximity to oilfield structures and/or potential discharge sites become exposed to contaminants and therefore may present a greater risk if consumed by humans. It may also be reasonable to assume that human populations residing near readily available sources of fresh seafood are more likely to consume it than populations where fresh seafood is less available.

Fisheries data show that 4.7 billion kg (5.23 million tons) of fish and shellfish were landed in the U.S. in 1993. This total has increased slightly over the past few years due to increased landings reported for the state of Alaska. The total for 1993 represents record commercial landings for both Alaska and the U.S. Louisiana landings for that year were approximately 12% of the U.S. total, while Texas landings represented 0.9% of that total. Fisheries landing data for 1993 for Louisiana show that the most common commercial saltwater sport finfish species landed was mullet with sheepshead and black drum following in succession (Usie, pers. comm. 1994, National Marine Fisheries Service [NMFS]). In Texas, the yellowfin tuna was listed as the most common commercial saltwater finfish species landed in 1992 with nearly 635,600 kg (1.4 million lb) caught. Red snapper was the next most common with 408,600 kg (0.9 million lb) landed (Hightower, pers. comm. 1994, Texas Parks and Wildlife Department [TPWD]).

Several families of fish are typically associated with offshore oilfield structures. Two of these families (i.e., Serranidae, Lutjanidae) include the commercially important groupers and snappers. Commercial landings of grouper and snapper in Louisiana for 1993 totaled 128,366 kg (283,000 lb) and 896,752 kg (1,977,000 lb), respectively. This represents 1.12% and 7.81% of the total Louisiana fish landings (excluding menhaden) for 1993. In Texas, the grouper and snapper species totaled 60,781 kg (134,000 lb) and 481,443 kg (1,061,400 lb), respectively, representing 2.71% and 21.51% of the total fish catch for 1992.

One of the most effective methods of determining the species-specific amounts of shellfish and finfish caught by residents of coastal areas is by conducting surveys. The NMFS has been conducting a series of marine recreational surveys for the Atlantic and Gulf Coasts since 1979. Surveys of recreational fishermen were designed to identify catch and general location of catch, plus some expenditure and demographic information. The most recent published survey information, covering the 1991 fishing season (NMFS, 1992), shows that 1991 marine recreational anglers caught spotted seatrout 15% of the time they fished in the GOM. Other frequently caught fish included white grunt, gray snapper, yellowtail snapper, black seabass, Spanish mackerel and sheepshead. The 1991 survey also showed that anglers primarily fished in private/rental boats (64-67%) in inshore waters (43%) catching 9.1-11.3 fish/trip (NMFS, 1992).

Kelso *et al.* (1991) performed a survey of Louisiana fishermen to determine their fishing activities for 1989. Surveys were mailed to both freshwater and saltwater fishermen, although the results were kept separate for each group. The surveys included questions regarding fishing expenditures in addition to the fishing activity data. Survey results indicated that 82% of all saltwater fishermen fished in a private boat in inshore waters during 1989. Approximately 76% of the fishermen targeted a specific species when planning a fishing trip. Spotted seatrout and red drum were the most sought after fish, representing 50% and 42% of the targeted species, respectively.

Surveys have also been performed not only to determine fishing habits but also to determine seafood consumption patterns. Dellenbarger *et al.* (1993) performed a survey of residents in south Louisiana over the Lenten period of 1993. The results of their study show that 70% of the respondents consumed seafood during the five-day period. Crawfish and shrimp were the most commonly consumed shellfish, while catfish and bass were the most common freshwater fish eaten and redfish and speckled trout were the most popular saltwater fish consumed. The authors concluded that for the five-day period respondents consumed an average meal of 60 g (2.1 oz) of finfish and shellfish on a per capita basis (i.e., 16 g [0.6 oz] of freshwater finfish, 13 g [0.4 oz] of saltwater finfish and 31 g [1.1 oz] of shellfish). The study also indicated that income and family size positively influenced shellfish consumption as well as recreational fishing habits. Therefore, they concluded that higher income families and large families had higher health risks from consuming seafood if the seafood had been exposed to human health contaminants.

Anderson and Rice (1992) completed a survey of fish and shellfish consumption patterns for the greater New Orleans area. Their study consisted of telephone interviews of residents regarding their seafood consumption habits for the week prior to the interview. Their results showed that 61.2% of the respondents ate seafood the week prior to the interview. Shrimp was the most popular seafood with catfish, speckled trout, crab and other saltwater fish next in order. The study calculated that those respondents who ate one serving of seafood the week before the interview consumed between 10.4 and 30.8 g (0.4-1.1 oz) of fish and between 13.6 and 32.6 g (0.5-1.1 oz) of shellfish, while those respondents who reported consuming two meals per week ate 20.9 to 61.5 g (0.7-2.2 oz) of fish and 26 to 65.1 g (0.9-2.3 oz) of shellfish.

A study by Devonald and Maxted (1989) provided average fisheries consumption data varying from 6.5 g to 180 g (0.2-6.3 oz) when site-specific data were unavailable for risk assessment projects. West *et al.* (1989) found that Michigan sport fishermen consume an average of 19.2 g (0.7 oz) per day per person during a survey completed in 1989.

The U.S. annual per capita consumption of fresh and frozen commercial fish and shellfish has risen nearly 2.5 times since 1908 when data were first recorded. In 1993, the annual consumption rate

was 4.6 kg (10.2 lb), reflecting the second highest rate behind the 4.9 kg (10.7 lb) consumed per person in 1987. The average annual per capita consumption of fresh and frozen seafood for the past ten years was 4.5 kg (9.9 lb) (NMFS, 1994).

There is a dearth of information regarding the distribution of seafood from the source (i.e., fishermen) through the various outlets (e.g., wholesaler, retailer, etc.) to the consumer. The primary purpose of this task was to obtain these data.

3.0 METHODOLOGY

3.1 Introduction

The first subtask was to conduct a thorough review of existing information, extract and assemble appropriate available data and identify significant data gaps. The literature search consisted of a detailed review of pertinent literature and information available from federal, state and local agencies and research institutions. A comprehensive electronic search was conducted through BRS Information Technologies.

Data bases searched included Life Sciences; Zoological Record; National Environmental Referral Service; CAB - Economics, Development and Education; Agricultural Biology and Environmental Sciences; and Health Industry Research Reports.

Additionally, the manual literature search included the following:

- Data published in the open literature (i.e., journals, government agency reports, conference and meeting abstracts and dissertation abstracts);
- Data available from trade associations and commercial organizations; and
- Data available from quasi-public groups such as seafood promotion boards, tourist commissions, etc.

Because the data search phase of the study revealed significant gaps in the existing information needed to determine the seafood catch, consumption and use patterns in the GOM region, the need to design and conduct field surveys was evident. The second subtask, therefore, was to design and to conduct descriptive field surveys that would fill the recognized deficiencies in existing information.

3.2 Field Surveys

In order to conduct the necessary interviews, contact was made with Fisheries Information and Seafood Harvest Inquiry Enterprise (FISHIE). This group agreed to perform the surveys and provide personnel for training. FISHIE personnel were instructed how to present the surveys, shown the areas of concern and provided with other pertinent information regarding the project.

3.3 Population Surveyed

Intercept/personal interviews, mail questionnaires and telephone questionnaires were used to survey the following groups in the states of Louisiana and Texas: 1) commercial fishermen (i.e., shrimpers, crabbers, oystermen and finfishermen); 2) recreational fishermen; 3) processing plants and wholesalers; 4) restaurants; 5) retailers; and 6) oystermen. Commercial and recreational fishermen were surveyed primarily by intercept/personal interviews although some telephone surveys were made to recreational fishermen. Oystermen were interviewed by personal interview. Fish farms were excluded from the surveys because fish raised in these facilities have no potential exposure to produced water.

Processors and wholesalers were surveyed by personal interview and by mail. Lists of processors and wholesalers for Louisiana and Texas were provided by the Seafood Division of the Louisiana State Department of Natural Resources (LDNR) and the TPWD. Retailers were surveyed by site visits.

Restaurants were surveyed by mail. The Louisiana Restaurant Association and the Texas Restaurant Association provided assistance in accomplishing these surveys.

3.4 Survey Zones

The coastal areas of Louisiana and Texas were divided into nine zones. The most important criterion for the delineation of each zone was that there be at least one, possibly two, port cities within it. Parish and county lines were followed to delineate the zones. Fishermen responding to the intercept questionnaire were shown a zone chart (see **Appendix B**) to aid in their response. Telephone survey respondents were asked which port city they used during fishing excursions.

3.5 Types of Surveys Used

Table 3.1 lists the types of surveys used in this study for each of the six fishermen groups. Two of the six groups were surveyed by two modes. Secondary modes provided additional sample information in addition to providing a check on the sample information obtained with the primary mode. Secondary modes were not used for groups in which the sample size obtained met the statistical requirements for the study.

Table 3.1. Summary of survey types employed by fishermen type.

Group Surveyed	Primary Mode	Secondary Mode
Recreational Fishermen	Personal Interview	Telephone
Commercial Fishermen	Personal Interview	--
Oystermen	Personal Interview	--
Processing Plants/Wholesalers	Mail	Personal Interview
Retailers	Site Visit	--
Restaurants	Mail	--

Each primary survey mode was selected because it was the best and most efficient means of acquiring data from that particular group. For example, the intercept interview is the most labor intensive survey approach but it is accepted as the most effective for commercial and recreational fishermen (Dillman, 1978; Ary *et al.*, 1990; Guthrie *et al.*, 1990; U.S. Environmental Protection Agency (EPA), Office of Water, 1992; Pollock *et al.*, 1994). The intercept interviews were performed at docking areas used by either commercial or recreational fishermen, or both.

3.6 Development of Survey Forms

To meet the objectives of this study, seven questionnaires were developed. The same survey was used for both the personal interview and the telephone interview to survey recreational fishermen. The following sources were used to develop the survey forms: 1) input from Brookhaven National Laboratory; 2) input from scientists affiliated with Steimle & Associates, Louisiana State University and the University of New Orleans; and 3) a review of existing fish consumption surveys from the following studies:

- "Marine Recreational Fishery Statistics Survey, Atlantic and Gulf Coasts, 1990-1991," Current Fisheries Statistics Number 9204 compiled by NMFS (1992);
- "Survey of Louisiana Sport Fishermen--1990" by Kelso *et al.* (1991);
- "A Survey of Fish and Shellfish Consumption by Residents of the Greater New Orleans Area" by Anderson and Rice (1992); and
- "Michigan Sport Anglers Fish Consumption Survey. A Report to the Michigan Toxic Substance Control Commission" by West *et al.* (1989).

The questionnaires were constructed to minimize the time required to collect the information. The items on the surveys were written concisely so that they would be easily understood. Every effort was made to avoid bias that might predetermine a respondent's answer. The direct approach was employed to avoid questions that might elicit reactions of embarrassment, suspicion, and hostility in the respondents. Redundancy was built into the surveys to ensure internal consistency.

A panel of experts was used to check content validity and reliability of the surveys. Separate field testing for each of the different surveys was conducted. Modifications to each survey were made based on the results of the field testing. A team of FISHIE technicians was then trained as interviewers and a second field testing was conducted. The surveys were revised again based on the results of the second field testing. The surveys are presented in **Appendices C** through **I**.

3.7 Fishermen Survey (Recreational and Commercial)

3.7.1 Introduction

The primary mode for surveying both commercial and recreational fishermen was the intercept/personal interview. The telephone interview method was used as secondary mode for the recreational fishermen in Zone IX. Recreational fishermen were most often interviewed at docks and at sports club meetings.

The intercept and telephone surveys were designed to determine a profile of the fishermen, the mode of fishing, location of seafood catch, the species of seafood caught, the quantity of seafood catch, the distribution of seafood catch, the frequency of seafood served, personal consumption patterns, the cooking methods used to prepare the seafood and the zip code of the respondent's residence. Examples of the surveys are given in **Appendices C, D,** and **E.**

3.7.2 Fishermen Profile

Demographic information was obtained from respondents for use in the health risk assessment. The following questions/items were addressed:

- What category(s) of seafood was fished over the last three months?
- What type of fishing license(s) was held --in-state, out-of-state, both in-state and out-of-state, and/or federal?
- How many people in the household eat seafood?
- Demographic information about the people in the household, include gender and ages of adults, number of children under the age of 18, race and number of females between the ages of 14 and 50.

3.7.3 Mode of Fishing

In order to determine the frequency of fishing and the locations fished, the questionnaire included a section on the mode of fishing. Recreational fishermen were asked how many fishing trips were made in the last three months and the number of times these fishing trips were spent at the following situations/locations:

- Off pier, dock, jetty, breakwater, seawall, bridge and/or shorelines/beach/bank;
- Private boat in inshore waters;
- Private boat in offshore waters; and
- Charter boats/party boats.

Since commercial fishermen fish exclusively in boats, the fishing mode was not asked on that questionnaire.

3.7.4 Location of Seafood Catch

To determine the locations fished, respondents to the intercept survey were shown a map of the regions in Louisiana and Texas and asked to indicate which of the nine zones they fished in the last three months. For the telephone questionnaire used with recreational fishermen (secondary mode), respondents were asked to indicate the closest port to their fishing location. A list of Louisiana and Texas ports was provided.

For the data analysis the ports were coded to match the zones. To determine what section of the region(s) they fished, the respondents were asked to indicate the location in relation to the shoreline: inshore, 0 to 4.8 km (0 to 3 mi) offshore, 4.8 to 16 km (3 to 10 mi) offshore and greater than 16 km (10 mi) offshore. For these locations, approximate percentage of catch was requested.

To determine how close fishing was conducted near potential produced water discharges, fishermen were asked to estimate distance from oilfield structures i.e., within 300 m (1,000 ft), from 300 m to 0.8 km (1,000 ft to 0.5 mi), from 0.8 km to 1.6 km (0.5 to 1.0 mi) and greater than 1.6 km (1.0 mi).

3.7.5 Species Caught

The species selected for the surveys were the ones most commonly caught and of commercial value along the GOM coast according to NMFS landing data (Usie, pers. comm. 1994, NMFS). Shellfish species included shrimp, blue crab and oysters. Finfish species included amberjack, black drum, croaker, dolphin, flounder, grouper, kingfish, king mackerel, redfish (recreational only), red snapper, shark, sheepshead, Spanish mackerel, speckled trout, tuna and vermilion snapper.

An identification guide with fish illustrated in color was shown to the respondents to enable them to correctly identify species (**Appendix J**). The illustrations were either of the species in question or were representative of a larger group of related fish. For example, illustrations were shown of the amberjack, croaker, sheepshead, red snapper, speckled trout, Spanish mackerel, redfish and king mackerel. A common representative of the genus *Thunnus* was shown as tuna and a common representative of the family Carcharhinidae was shown to represent shark.

The special restriction on redfish in Louisiana and Texas was addressed by the project team. For commercial fishermen, the catch and resale of redfish is not allowed. Recreational fishermen have a restricted number of fish allowed and weight limitations (Louisiana Department of Wildlife and Fisheries [LDWF], Wildlife and Fisheries Commission, 1993; TPWD, 1993).

The recreational and commercial fishermen were asked to estimate the quantity of fish or shellfish caught in terms of either number of fish, pounds, dozens, sacks or other common units of measure.

3.7.6 Distribution Patterns

To determine the distribution of seafood catch through the population, both commercial and recreational fishermen were asked to estimate by species the percentage given away to others for consumption and the percentage kept for personal consumption. Commercial fishermen were asked to specify what percentage of the listed species were sold and to whom (i.e., wholesalers or processing plant, retailers or restaurants, consumers--friends/relatives and others). To ascertain whether there was agreement among the different groups surveyed, the questionnaires asked respondents a series of redundant questions (e.g., processors/wholesalers were asked about the sources of seafood; and commercial fishermen were asked about the destination of their catch).

3.7.7 Consumption Patterns

To identify the frequency of fish served and/or eaten by recreational and commercial fishermen, respondents were asked to estimate how many times on average per week that fish that they had caught during the last three months had been served/eaten in their household. Respondents were also asked to estimate how many days it had been since the last meal of fish was served in their household (i.e., for fish that they had caught during the past three months). The respondents were asked which species were eaten and which parts of the fish (i.e., meat and/or skin) were consumed.

To obtain further information on consumption patterns, the fishermen were asked to give all the cooking methods used to prepare the seafood they caught during the three months prior to the questionnaire interview. The cooking methods listed on the questionnaires included baked, barbecued, blackened, boiled/poached, broiled, fried, grilled, smoked, stew/soup and other.

3.7.8 Administration of the Fishermen Survey

Both recreational and commercial fishermen surveys were conducted during spring, summer and fall (May through November, 1993). A team of FISHIE technicians was trained to administer the intercept questionnaires designed by the project team. For the intercept surveys (i.e., the primary survey mode), recreational and commercial fishermen were interviewed at the docking areas. Recreational fishermen were also interviewed at sports clubs.

3.8 Commercial Oyster Fishermen Survey

3.8.1 Introduction

The intercept/personal interview was the primary mode used for both the Louisiana and Texas commercial oyster fishermen. A copy of this form is provided in **Appendix F**.

3.8.2 Fishermen Profile

The survey addressed the following demographics:

- How many acres of oyster grounds were under lease?
- What type of fishing license(s) was held: in-state, out-of-state, both in-state and out-of-state and federal?
- How many people in the household eat oysters?
- Demographic information about the people in the household, including gender and ages of adults, number of children under the age of 18, race and number of females between the ages of 14 and 50.

3.8.3 Location of Seafood Catch

To determine the location of the seafood catch, the same types of questions that were used on the recreational and commercial fishermen surveys were used on the oyster fishermen survey. The oystermen were asked to identify zones or regions across the Gulf Coast of Louisiana and Texas where they fished in the last three months. To determine whether the oystermen fished near areas of produced water discharges, the respondents were asked to indicate the fishing location in relation to offshore or inshore oilfield structures.

3.8.4 Distribution Patterns

To identify the distribution of oysters harvested, the fishermen were asked to estimate the percentage sold and to whom (i.e., wholesalers or processing plants, retailers or restaurants and other), the percentage given away to others and the percentage kept for personal consumption.

3.8.5 Consumption Patterns

The oystermen were asked to estimate the average number of times per week that oysters they harvested were served or eaten in their household. A second question sought information on how recently oysters had been consumed by the fishermen or by members of their household. The respondents were also asked what percentage of the oysters eaten by them and their family was eaten raw.

To determine the cooking methods used to prepare oysters that were harvested during the past three months, the fishermen were asked to check all methods that applied. The cooking methods listed were baked, barbecued, blackened, boiled/poached, broiled, fried, grilled, smoked, stew/soup and other.

3.8.6 Administration of the Oyster Fishermen Survey

The oystermen intercept survey was administered by the field technician during the period of April to May 1994 in Louisiana and Texas at docks or at the oysterman's residence.

3.9 Processing Plants and Wholesalers Survey

3.9.1 Introduction

The survey design for the processors and wholesalers concentrated on identifying the sources and quantities of seafood species, as well as the distribution patterns of the seafood handled. The primary mode used to survey processing plants and wholesalers in Louisiana and Texas was a mail survey. The secondary mode utilized was the personal interview method.

Only processing plants that process seafood for human consumption were included in the study database. The respondents were asked whether they operated as a processor only, as a wholesaler/dealer only or both as a processor and a wholesaler/dealer. The surveys were designed to gather information on the source, quantities and distribution of saltwater seafood sold during the time period of 1 January through 31 December 1992. This time period was selected because the respondents would have access to the monthly reports that they complete and submit to state agencies, therefore ensuring a higher rate of return. The questionnaires were administered from June through December 1993.

3.9.2 Sources of Seafood

To determine the sources of seafood to processing plants and wholesalers, the respondents were ask to estimate the percentage of saltwater finfish and shellfish (i.e., shrimp, oyster and blue crab) which were bought from the following sources:

- In-state commercial fishermen;
- In-state wholesalers/dealers;
- In-state processing plants;
- Out-of-state sources; and
- Out-of-country sources.

To further define the origin of seafood catch, the respondents were asked to identify the fishing zones and ports of their commercial fishermen suppliers. If commercial fishermen were suppliers of their seafood, the respondents were asked to estimate the relative percentages of the fishermen fishing inshore (i.e., inside the barrier islands) and offshore (i.e., outside the barrier islands). To determine whether the fishing sites were near oilfield structures, the respondents were also asked to estimate the percentage of suppliers who fished inshore and the percentage fishing near inshore oilfield structures. Similarly, they were asked the percentage of suppliers who fish offshore and the percentage fishing near offshore oilfield structures.

To determine the zone(s) where the seafood was obtained, the respondents were asked to check all Louisiana and Texas port(s) where their commercial fishermen suppliers were based. This catch

distribution information was also used to check for agreement among the different types of groups surveyed.

3.9.3 Quantity of Seafood Obtained

To obtain an estimate of the quantities of seafood handled by processing plants and wholesalers for the 1992 calendar year, the questionnaire was constructed to have the respondents specify the quantity in terms of product weight and units of measurements. This information was gathered for the following four categories:

- Saltwater fish (i.e., whole fish and fish parts);
- Shrimp (i.e., heads-on and heads-off);
- Oysters (i.e., oysters in shell and oyster meat); and
- Blue crabs (i.e., hard shell, soft shell and crab meat).

3.9.4 Distribution Patterns

To determine importation and exportation patterns of seafood handled, the survey addressed the distribution of the end product. The processing plants and wholesalers were asked to provide estimates of the percentages of the total shellfish and saltwater finfish that were sold to various outlets for all of the 1992 calendar year. The two major categories of outlets used on the survey were in-state and out-of-state. The in-state outlets were further subdivided into wholesalers/dealers, processing plants, restaurants/retailers and other outlets. The out-of-state category was not subdivided.

The distribution information was requested for the following shellfish: shrimp, oysters, hard shell blue crabs, soft shell blue crabs and blue crab meat. Individual estimates for distribution outlets for saltwater finfish were requested for the most popular species (i.e., black drum, flounder, red snapper, sheepshead, speckled trout, tuna and vermilion snapper). For the remaining and less popular species (i.e., amberjack, croaker, dolphin, grouper, king mackerel, shark, kingfish and Spanish mackerel), the respondents were asked whether they handled any of these species and what percentage of the total finfish handled these eight species combined represented.

3.9.5 Product Form of Seafood Sold

Information was sought on which parts and in what product form the seafood was processed and/or sold. The processing plants and wholesalers were asked to identify the most commonly sold form of seafood. For shellfish, the following forms were listed:

- Oysters--in shell, shucked, and prepared products (e.g., breaded/gumbo);
- Blue crabs--whole, meat, prepared products (e.g., stuffed); and
- Shrimp--heads-on, heads-off, shell on, peeled & undeveined, peeled & deveined, and prepared products (e.g., breaded/gumbo).

The product forms for the most popular finfish listed on the survey were as follows:

- Whole fish;
- Fillets with skin;
- Fillets without skin; and
- Other.

For other finfish sold, the respondents were asked to indicate the species and the form in which they were sold.

3.9.6 Administration of the Wholesalers/Processors Survey

Lists of processors and wholesalers were obtained from the LDWF, Seafood Division and from the TPWD. Questionnaires were mailed to all processors and wholesalers on the list who dealt primarily with saltwater species. The survey form is shown in **Appendix G**. An endorsement was obtained from the executive director of the Louisiana Seafood Marketing and Promotion Board. In memorandum form, it was addressed to Louisiana seafood processors and it requested their participation in the survey (see **Appendix K**).

3.10 Retailer Seafood Market Onsite Survey

3.10.1 Introduction

To ensure a higher rate of response, a team of FISHIE technicians was trained to conduct on-site surveys of retailer seafood markets in Louisiana and Texas. The survey team gathered data on the type of shellfish and saltwater finfish sold, the parts of the seafood sold and the types of prepared seafood sold.

3.10.2 Species Sold

The two main categories of seafood used for this survey were shellfish and finfish. The shellfish were listed as follows:

- Blue crabs--hard shell, soft shell, meat;
- Oysters--whole with shell, meat; and
- Shrimp--heads-on, heads-off, peeled.

For the list of commonly consumed saltwater finfish, the technicians were asked to indicate whether the fish was sold whole or as fillets and whether the whole fish or fillets were sold with or without skin. If the finfish was sold as parts, the surveyors were asked to specify the parts.

3.10.3 Distribution Patterns

To determine the distribution of the seafood, the surveyors were instructed to ask the retailers if they shipped seafood to other areas of the state and if they shipped out-of-state.

3.10.4 Cooking Methods

If either shellfish or saltwater finfish was sold cooked, the FISHIE technicians were instructed to indicate how the seafood was prepared. Space was provided on the survey form for inserting in the information.

3.10.5 Administration of the Retail Seafood Market Onsite Survey

Telephone directories were used to locate the retail seafood markets in the nine zones. Large supermarket chains were excluded because of their diversity of seafood sources which may or may not represent local sources. These onsite surveys were conducted at approximately the same time the fishermen intercept questionnaires were administered by the field technicians. The technicians recorded the name, address, and parish/county of the retailers. The date and time the market data was collected was also recorded. The survey is presented in **Appendix H.**

3.11 Restaurant Survey

3.11.1 Introduction

The restaurant surveys were designed not only to provide data on seafood consumption in restaurants, but to infer population consumption preferences in the areas of the restaurants. The respondents were asked to provide information concerning the source, quantities, and method of preparation of seafood served/sold by their restaurant for the time period of 1 January through 31 December 1992 (**Appendix I**).

3.11.2 Seafood Served

To determine the popularity of seafood dishes in the restaurants surveyed, respondents were asked approximately how many seafood dishes were served per week for the year 1992. Of the seafood dishes served, they were asked to estimate the percentage of shellfish, finfish and/or a combination of shellfish and finfish for the year 1992. The respondents were also asked to provide the average percentage of the different types of shellfish dishes and the different species of finfish served per week.

The survey was designed to determine whether restaurants served dishes that included seafood stock and what shellfish and/or finfish parts were used to prepare the stock. Data were gathered on the frequency of consumption of finfish parts by asking the respondents what parts of the fish (i.e., meat and/or skin) were consumed and what parts of the fish were used for stock.

3.11.3 Source of Seafood

The mail survey also focused on gathering data on the identification of the providers of seafood: commercial fishermen, wholesalers/processors, retailers and other. The respondents were asked to indicate what percentage of their seafood was imported from areas other than Louisiana or Texas for the year 1992.

3.11.4 Cooking Methods

To determine the most frequently used cooking methods for seafood served in the restaurants surveyed for the year 1992, the respondents were asked to check all of the following categories that were applicable to seafood available on their menu: baked, barbecued, blackened, boiled/poached, broiled, fried, grilled, smoked, stew/soup and other.

3.11.5 Administration of the Restaurant Survey

The Louisiana Restaurant Association allowed the project team to add the restaurant questionnaire to their newsletter that was mailed to approximately 1,500 association members. A short narrative describing the purpose of the project and a request to the membership to participate by completing the survey were included in the newsletter (**Appendix L**).

The Texas Restaurant Association provided mailing labels and a letter of endorsement (**Appendix K**) to be included with the survey. A bulk mailing procedure was used for the Texas Restaurant Survey. The Texas survey was sent to 1,500 restaurants that were located in the eastern portion of the state.

3.12 Sampling Plan

The sampling procedure was designed to provide a stratified random sample of the various subgroups of the population. The coastal area of Louisiana and Texas was divided into nine zones. Within each zone survey information was obtained from recreational fishermen, commercial fishermen, processors and wholesalers, retail seafood markets and restaurants concerning shellfish and finfish consumption and use.

The sample size objective was to have at least 30 responses for each subgroup within surveys. Sample sizes of 30 or more permit assumptions associated with the central limit theorem concerning the normality of sampling distributions employed in statistical analyses. The sample size objective of at least 30 was realized in all survey subgroups except the commercial finfishermen.

3.13 Statistical Procedures

The statistical procedures employed in the data quality analyses presented in Section 4, and in the interpretation of survey information presented in Section 5, are described in Sokal and Rohlf (1994).

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4.0 DATA QUALITY ANALYSIS

4.1 Introduction

The objective of the data quality analysis was to determine whether survey information concerning finfish species was consistent both within and among surveys. The data quality analysis focused only on finfish information from the ten surveys. This was a necessary choice because finfish species information was the only information common to all surveys. Nine data sets were constructed from the ten surveys; data from the two commercial fishermen surveys were pooled to increase sample size. The nine data sets are listed below with their respective sample sizes.

■ Louisiana Recreational Finfishermen	N = 513
■ Texas Recreational Finfishermen	N = 381
■ POOLED Commercial Fishermen	N = 28
- Louisiana Commercial Finfishermen	N = 23
- Texas Commercial Finfishermen	N = 5
■ Louisiana Wholesalers and Processors	N = 74
■ Texas Wholesalers and Processors	N = 22
■ Louisiana Retail Seafood Markets	N = 226
■ Texas Retail Seafood Markets	N = 115
■ Louisiana Restaurants	N = 79
■ Texas Restaurants	N = 75

The data quality analysis was performed in three parts, including;

1) An intrasurvey analysis of the Louisiana recreational finfishermen data set. The question addressed was whether fishermen reported similar species caught in the six different Louisiana geographic zones used in the survey. An analysis of variance was conducted on fishermen responses in the six zones to determine if they were significantly different;

2) An intrasurvey analysis of the Texas recreational finfishermen data set. The question addressed was whether fishermen reported similar species caught in the three different Texas geographic zones used in the survey. An analysis of variance was conducted on fishermen responses in the three zones to determine if they were significantly different; and

3) An intersurvey analysis that included all nine data sets indicated above. The question addressed was whether the information obtained in the nine surveys was consistent with respect to finfish species. An analysis of variance was conducted on the nine data sets to determine if they were significantly different with respect to the information on select finfish.

4.2 Conversion of Data to Proportions

In each survey, the data reported on finfish species were converted to proportions. This procedure was employed because it provided a common measure for comparisons among surveys where the reporting units were different. The procedure followed in calculating proportions for the several data sets is outlined below.

4.2.1 Louisiana and Texas Recreational Fishermen

Six geographic zones were used in the Louisiana survey. Three geographic zones were used in the Texas survey. Fishermen responses for finfish species were either 1) number of fish caught or 2) weight (e.g., lb) of fish caught. The two responses were mutually exclusive. For intrasurvey analyses, the responses were counted for each species within each zone and then divided by the total number of fishermen reporting catch within that zone. For the intersurvey analysis, the responses were counted for each species over all zones and then divided by the total number of fishermen reporting.

4.2.2 Louisiana and Texas Commercial Fishermen

Fishermen responses for finfish species were percent of catch sold to 1) wholesalers/processors or 2) restaurants/retailers. For the intersurvey analysis, the responses were counted for each species over all zones and then divided by the total number of fishermen reporting finfish information.

4.2.3 Louisiana and Texas Wholesalers and Processors

Wholesaler's and processor's responses for distribution of saltwater finfish species were as follows: 1) wholesalers/dealers; 2) processing plants; 3) restaurants/retailers; 4) other outlets; and 5) out-of-state. For the intersurvey analysis, the responses were counted for each species over all zones and then divided by the total number of survey responses.

4.2.4 Louisiana and Texas Retail Markets

Retailer's responses for distribution of finfish species were as follows: 1) whole fish with skin; 2) whole fish without skin; 3) fish fillets with skin; 4) fish fillets without skin; 5) parts; and 6) cooked. For the intersurvey analysis, the responses were counted for each species over all zones and then divided by the total number of surveys conducted.

4.2.5 Louisiana and Texas Restaurants

The restaurateurs' responses for distribution of finfish species were limited to the percentage of dishes served using particular species. For the intersurvey analysis, the responses for each species were counted and then divided by the total number of survey responses.

4.3 Analysis of Variance

4.3.1 Introduction

The randomized block design was used in both intrasurvey analyses and the intersurvey analysis. It was a two-way analysis of variance since an observation was categorized on the basis of two criteria -- the block (species) to which it belongs as well as the treatment group to which it belongs. There was, however, only a single factor of interest -- the treatment group, which was geographical zone in the intrasurvey analyses, and survey in the intersurvey analysis.

The objective in using the randomized block design was to isolate and remove from the error term the variation attributable to blocks, while assuring that treatment means were free of block effects.

The model equation:

$$x_{ij} = U + B_i + T_j + e_{ij}$$
$$i = 1,2, \ldots, n; \quad j = 1,2, \ldots, k.$$

In this model:

x_{ij} is a typical value from the overall population;
U is an unknown constant;
B_i represents a block effect reflecting the fact that the experimental unit fell in the *i*th block;
T_j represents a treatment effect, reflecting the fact that the experimental unit received the *j*th treatment; and
e_{ij} is a residual ("error") component representing all sources of variation other than treatments and blocks.

Major assumptions of the model include:

- The e_{ij} are independently and normally distributed with mean 0 and common variance σ^2; and
- The block and treatment effects are additive.

4.3.2 Intrasurvey Analysis -- Louisiana Recreational Fishermen

The objective of this analysis was to determine whether fishermen were reporting similar finfish species caught in the six geographic zones used in the survey.

Methodology

- Sample proportions were calculated for each species in each zone as indicated above;
- Sample proportions (p) were transformed with the transformation, $\Theta = \arcsin \sqrt{p}$; and
- Transformed proportions (zero) were approximately normally distributed with common variance.

Analysis of Variance

- Randomized block design. The block effect was species with interest focused on the zone effect;
- The hypothesis under test, H_o: Proportions in the six zones are not significantly different; and
- Results: The nonsignificant zone effect ($p = 0.219$) indicates that one cannot reject the hypothesis under test. One can conclude that there are not significant differences among the six zones in species reported. Results of the analysis of variance for the Louisiana recreational fishermen survey are given in **Table 4.1**.

Table 4.1. Results of the analysis of variance for the Louisiana recreational fishermen survey.

Source	Sum-of-Square	DF	Mean-Square	F	P
Species	6.999	16	0.437	33.163	--
Zone	0.095	5	0.019	1.439	0.219
Error	1.055	80	0.013	--	--
Total	8.149	101	--	--	--

4.3.3 Intrasurvey Analysis -- Texas Recreational Fishermen

The objective of this analysis was to determine whether fishermen were reporting similar finfish species caught in the three geographic zones used in the survey.

Methodology

- Sample proportions were calculated for each species in each zone as indicated above;
- Sample proportions (p) were transformed with the transformation, $\Theta = \arcsin \sqrt{p}$; and
- Transformed proportions (zero) were approximately normally distributed with common variance.

Analysis of Variance

- Randomized block design. The block effect was species with interest focused on the zone effect;
- The hypothesis under test, H_o: Proportions in the three zones are not significantly different; and
- Results: The nonsignificant zone effect ($p = 0.887$) indicates that one cannot reject the hypothesis under test. One can conclude that there are not significant differences among the three zones in species reported. Results of the analysis of variance for the Texas recreational fishermen survey are given in **Table 4.2.**

Table 4.2. Results of the analysis of variance for the Texas recreational fishermen survey.

Source	Sum-of-Square	DF	Mean-Square	F	P
Species	1.595	16	0.100	7.661	--
Zone	0.003	2	0.002	0.120	0.887
Error	0.416	32	0.013	--	--
Total	2.014	50	--	--	--

4.3.4 Intersurvey Analysis -- Nine Data Sets from Ten Surveys

The objective of this analysis was to determine whether there was consistent reporting concerning finfish species among the nine data sets derived from the ten surveys.

Methodology

- Sample proportions were calculated for each species in each survey as indicated above;
- Sample proportions for individual species were converted to a common base (i.e., normalized) by dividing the proportions for a given survey by the largest proportion in that survey. This procedure permitted direct comparison of species proportions from different surveys;
- Sample proportions (p) were transformed with the transformation, $\Theta = \arcsin \sqrt{p}$; and
- Transformed proportions (zero) were approximately normally distributed with common variance.

Analysis of Variance

- Randomized block design. The block effect was species. Some blocks were incomplete because some species (e.g., redfish) were not considered in all surveys. Interest is focused on the survey effect;
- The hypothesis under test, H_o: Species proportions in the nine surveys are not significantly different; and
- Results: The nonsignificant survey effect ($p = 0.177$) indicates that one cannot reject the hypothesis under test. One can conclude that there are not significant differences among the nine data sets in species reported. Results of the analysis of variance for the intersurvey analysis are given in **Table 4.3.**

Table 4.3. Results of the analysis of variance for the intersurvey comparisons.

Source	Sum-of-Square	DF	Mean-Square	F	P
Species	13.353	16	0.835	9.807	--
Zone	0.997	8	0.125	1.465	0.177
Error	10.297	121	0.085	--	--
Total	24.647	145	--	--	--

Consistent reporting of finfish information among the several surveys suggests, for example, that finfish catches reported by commercial and recreational fishermen are representative of finfish availability in retail markets and restaurants.

5.0 RESULTS

5.1 Introduction

The responses to the various surveys were tabulated and graphed. Tabulated data are included in a separate data appendix (**Data Appendix 1**). The results of all survey responses are summarized below.

5.2 Louisiana Recreational Fishermen Survey

Of the 245,952 individuals holding saltwater sport fishing licenses issued by LDWF in 1993, 524 individuals (0.21%) were interviewed by FISHIE personnel.

5.2.1 Fishermen Profile

Recreational fishermen answered questions concerning their fishing and seafood consumption habits as well as personal information. Among the respondents, finfishing was the most popular form of recreational fishing (95%), followed by crabbing (2.5%), shrimping (2.4%) and oystering (0.4%) (**Figure 5.1**). Most recreational fishermen possessed an in-state fishing license (92%), while 2% held an out-of-state license and 6% retained both (**Figure 5.2**). The majority of respondents (92%) were white (**Figure 5.3**).

The respondents indicated the mean number of fish consumers per household was 3.3. The household consisted of a mean of 1.7 males and 1.7 females with the adults having a mean age of 37 years. The household also contained a mean of 1.8 children under the age of 18 and a mean of 1.4 females of child bearing years (i.e., 14-50 years).

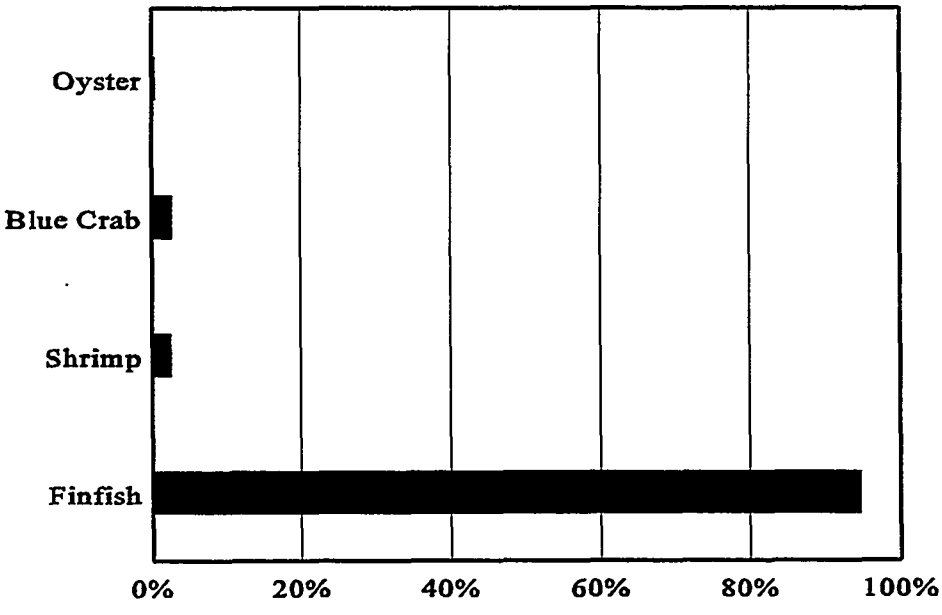

Figure 5.1. Frequency distribution of category fished for Louisiana recreational fishermen.

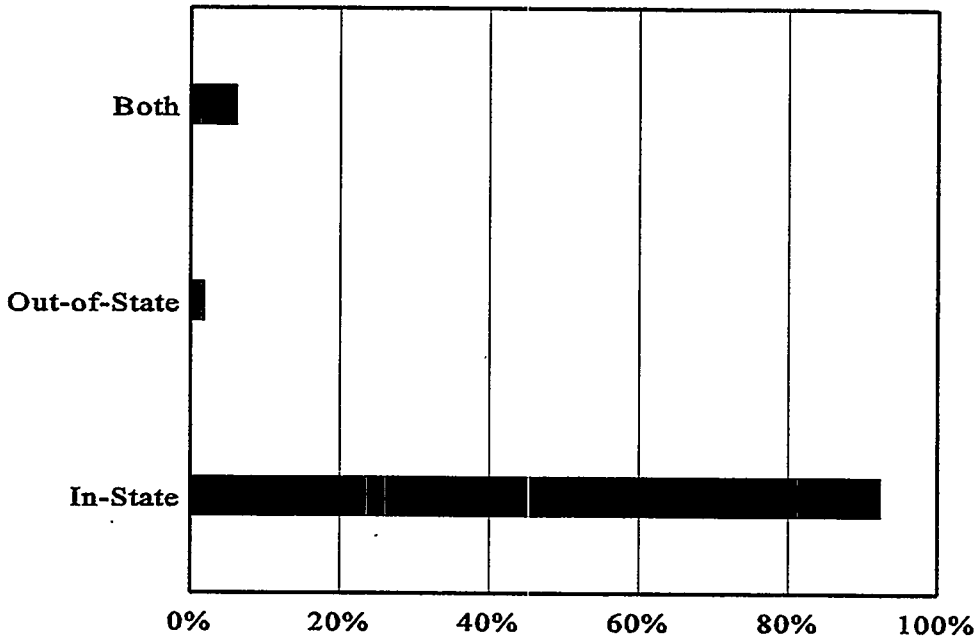

Figure 5.2. Frequency distribution of types of fishing licenses for Louisiana recreational fishermen.

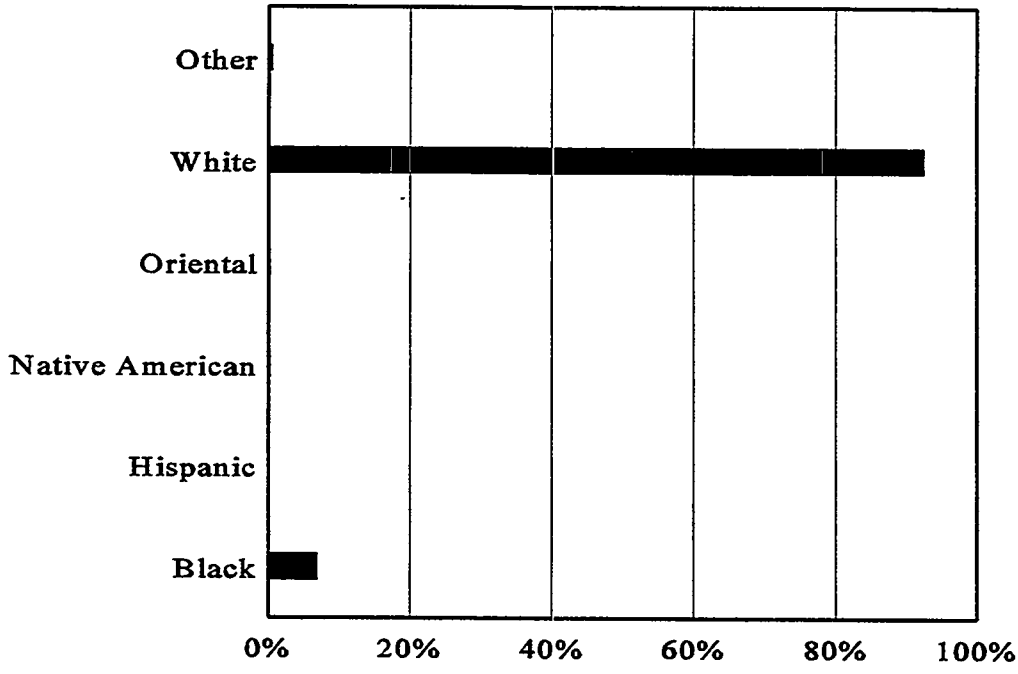

Figure 5.3. Frequency distribution of race for Louisiana recreational fishermen.

5.2.2 Mode of Fishing

The majority of the respondents fished from a private boat in inshore waters (62%) or a private boat in offshore waters (29%) (**Figure 5.4**). The mean number of fishing trips in the past three months was 10.5.

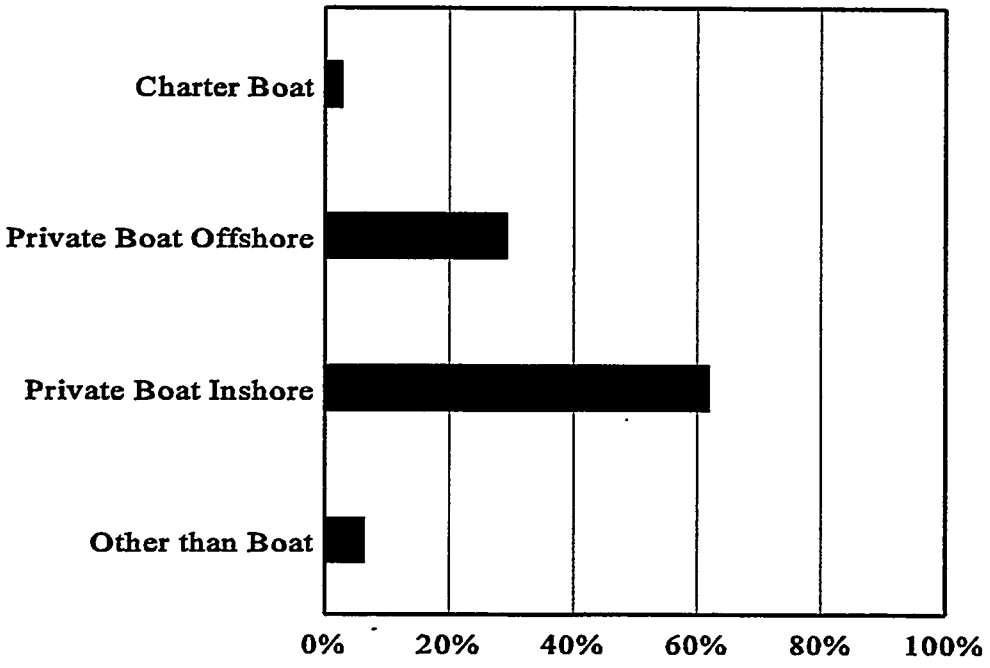

Figure 5.4. Frequency distribution of fishing mode for Louisiana recreational fishermen.

5.2.3 Location of Seafood Catch

In Louisiana, the most popular fishing area was Zone IV (21.4%), followed by Zone II (20.8%) and Zone III (18.4%) (**Figure 5.5**). The recreational fishermen primarily fished in the inshore areas (60%), although trips greater than 16 km (10 mi) from shore were also common (22%) (**Figure 5.6**). The frequency of trips within 300 m (1,000 ft) of an oilfield structure was 38%, although 36% of the trips were greater than 1.6 km (1.0 mi) from an oilfield structure (**Figure 5.7**).

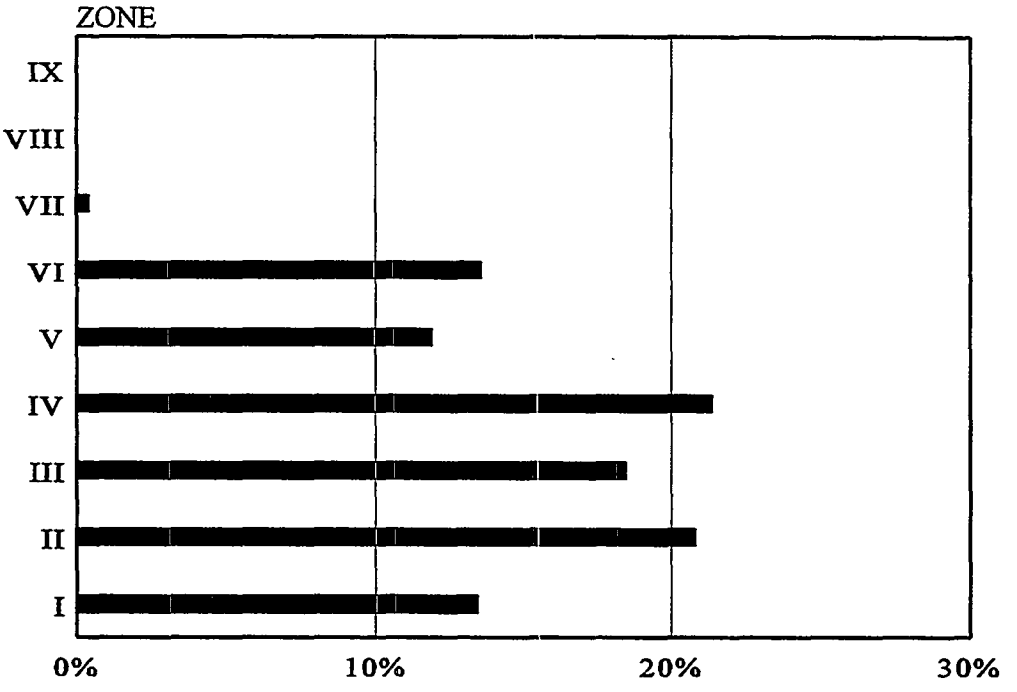

Figure 5.5. Frequency distribution of fishing zones for Louisiana recreational fishermen.

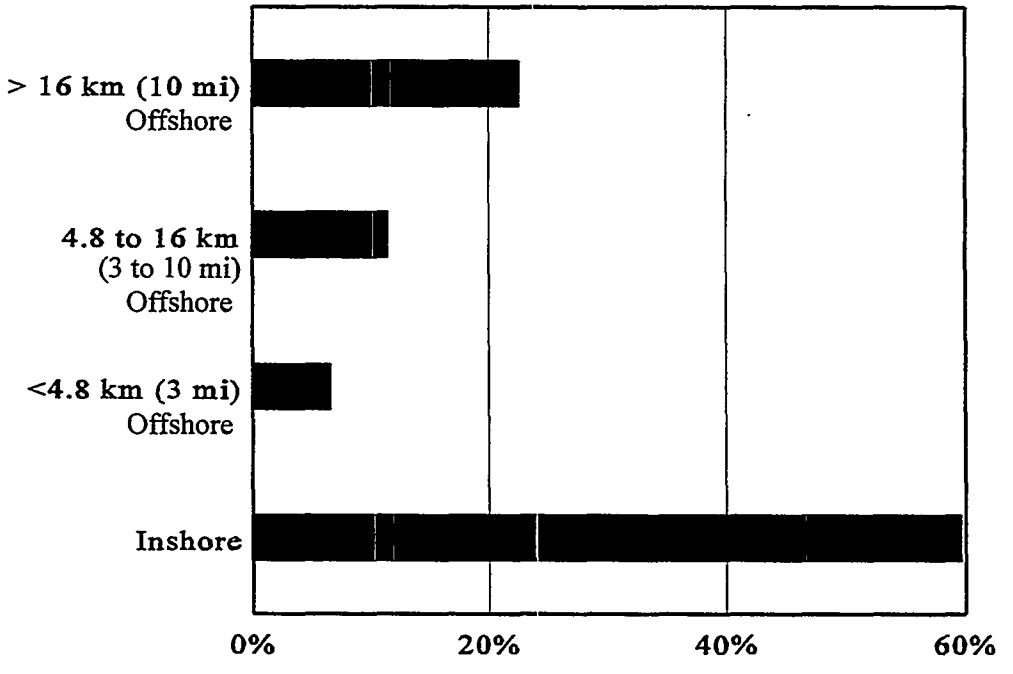

Figure 5.6. Frequency distribution of fishing location for Louisiana recreational fishermen.

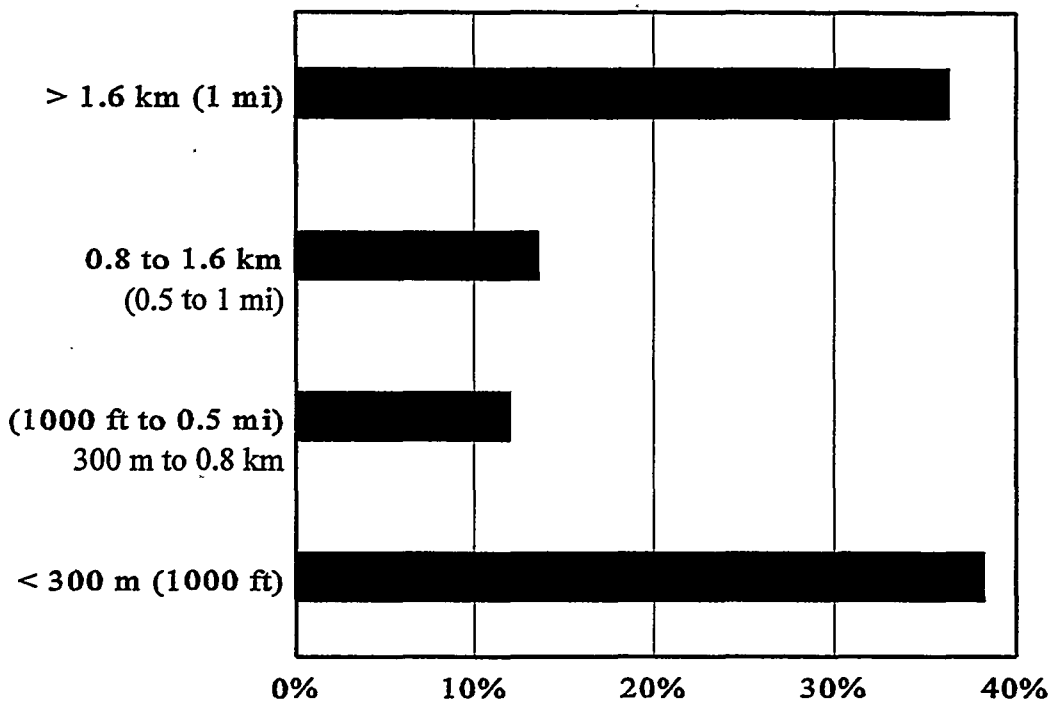

Figure 5.7. Frequency distribution of trips in proximity to oilfield structures for Louisiana recreational fishermen.

5.2.4 Species Caught and Distribution Patterns

The average number of shellfish and finfish by species caught among Louisiana recreational fishermen over the six-month period is given in **Figure 5.8.** Speckled trout and red snapper were the most common species caught. Estimates of the average weight of species caught are given in **Figure 5.9.**

Fishermen reported that they generally kept 80% or more of their catch for personal consumption. Only tuna and vermilion snapper, at 77% and 75%, respectively, were kept less often than the other species. The fish species most commonly saved included kingfish (94%), sheepshead (93%), black drum (93%), flounder (92%) and redfish (91%). Blue crabs and shrimp were kept for personal consumption 97% and 83% of the time, respectively (**Figure 5.10**).

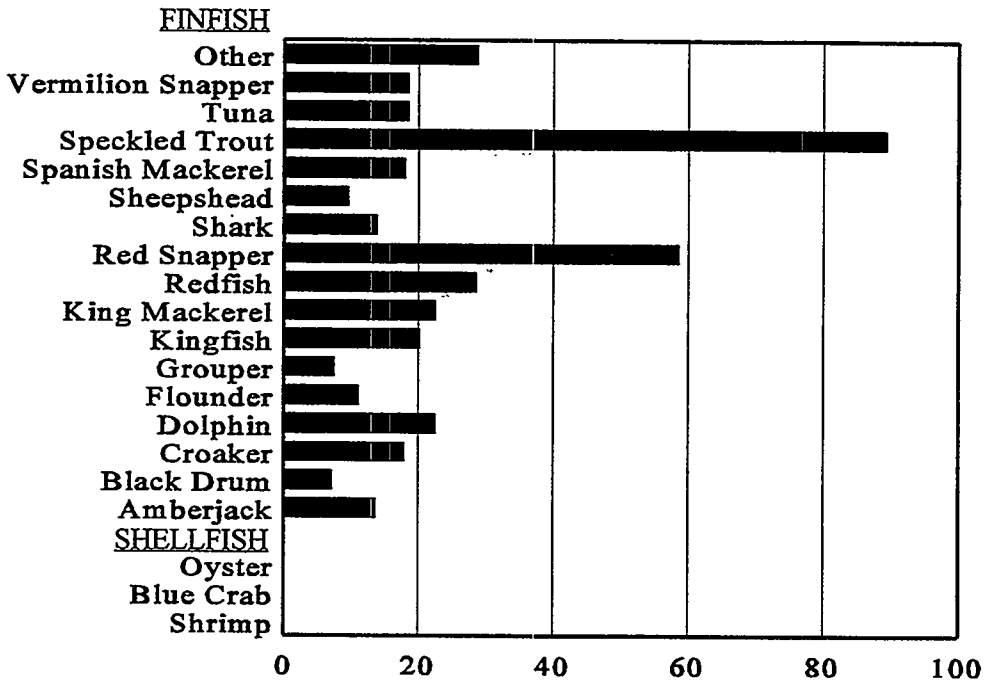

Figure 5.8. Average number of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.

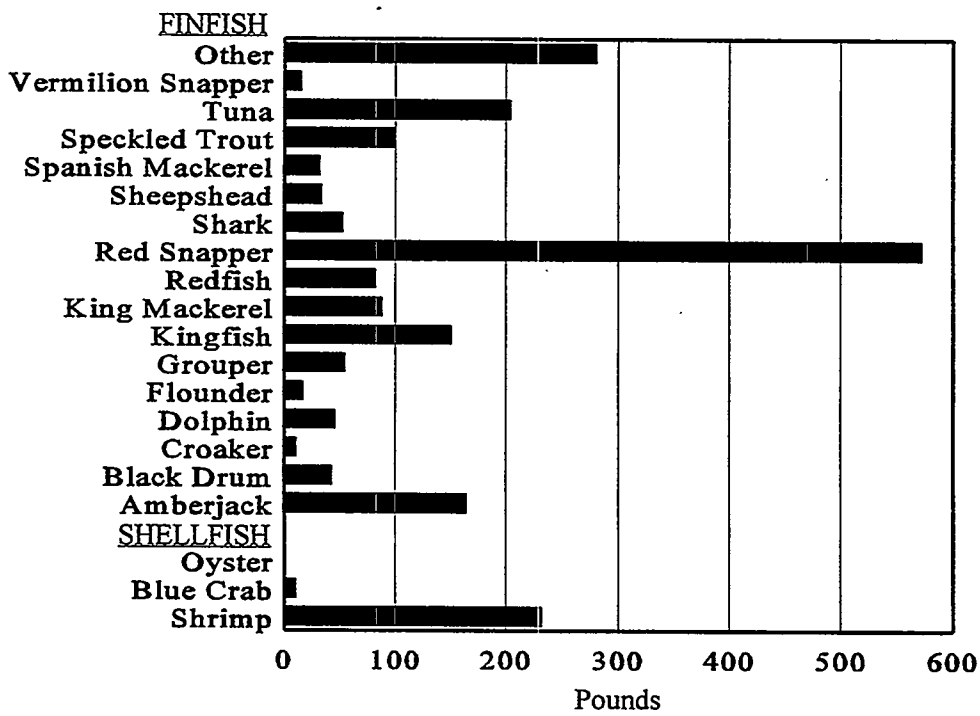

Figure 5.9. Estimates of average weight of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.

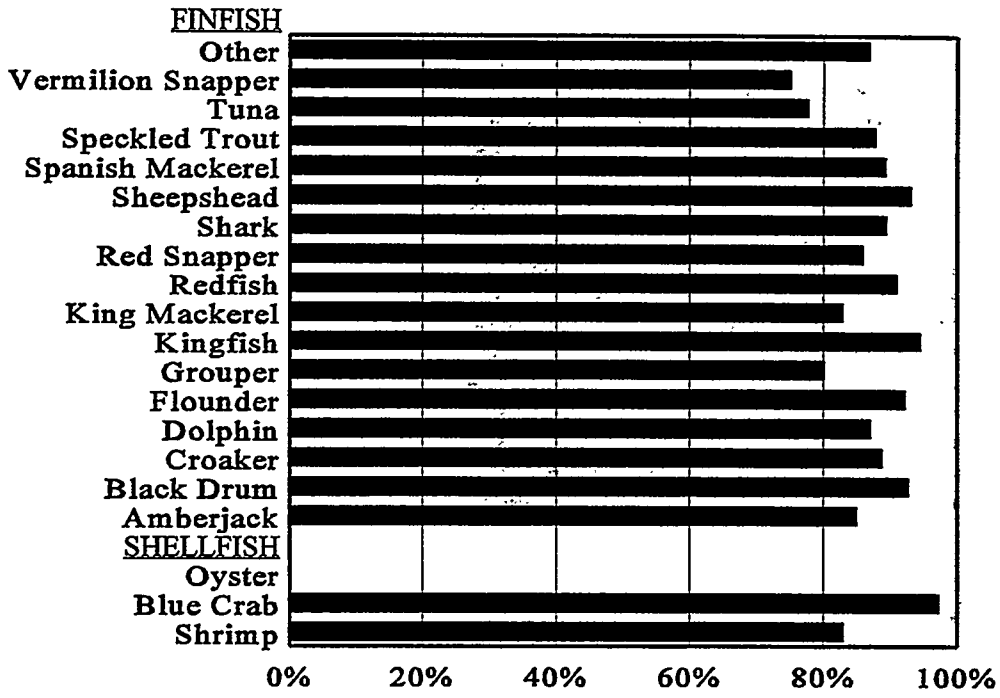

Figure 5.10. Average percentage of shellfish and finfish species kept for personal use by Louisiana recreational fishermen.

5.2.5 Consumption Patterns

Of the seafood caught and kept for personal consumption, fishermen reported that they served seafood a mean of 1.8 times per week in their household. The mean number of days since the last fish meal was 4.6 days.

The fishermen responded that they would rather consume the meat only from the fish species they caught and kept. With the exception of Spanish mackerel, redfish, flounder and croaker, fishermen ate the meat only in excess of 90% of the time (**Figure 5.11**).

The preferred method of cooking seafood among the respondents was fried (30%). Other popular methods included baked (17%), broiled (14%), grilled (14%) and barbecued (11%) (**Figure 5.12**).

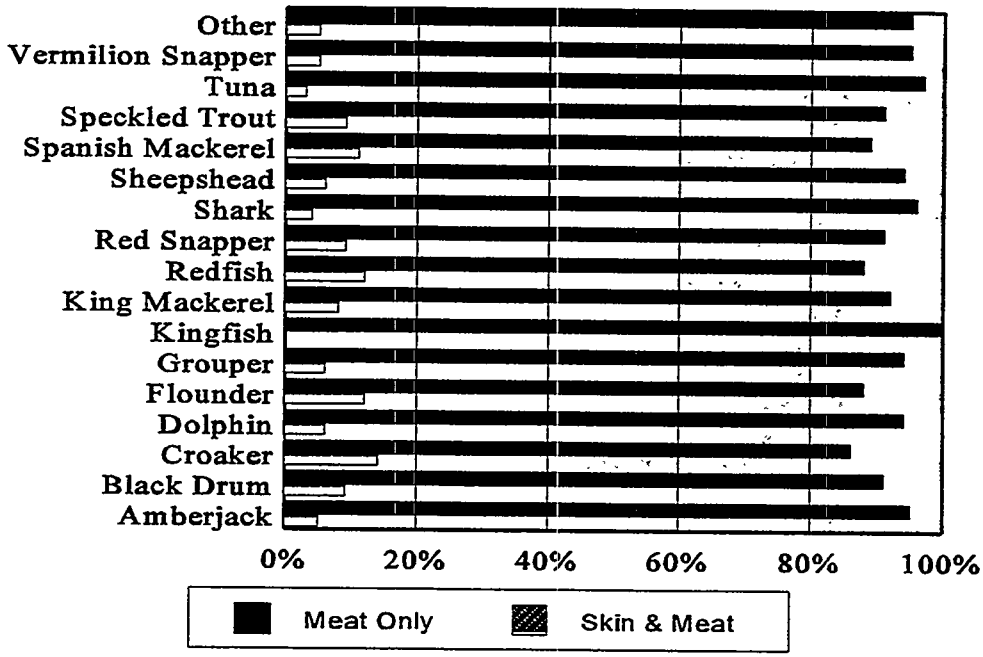

Figure 5.11. Percentage of finfish parts consumed by Louisiana recreational fishermen.

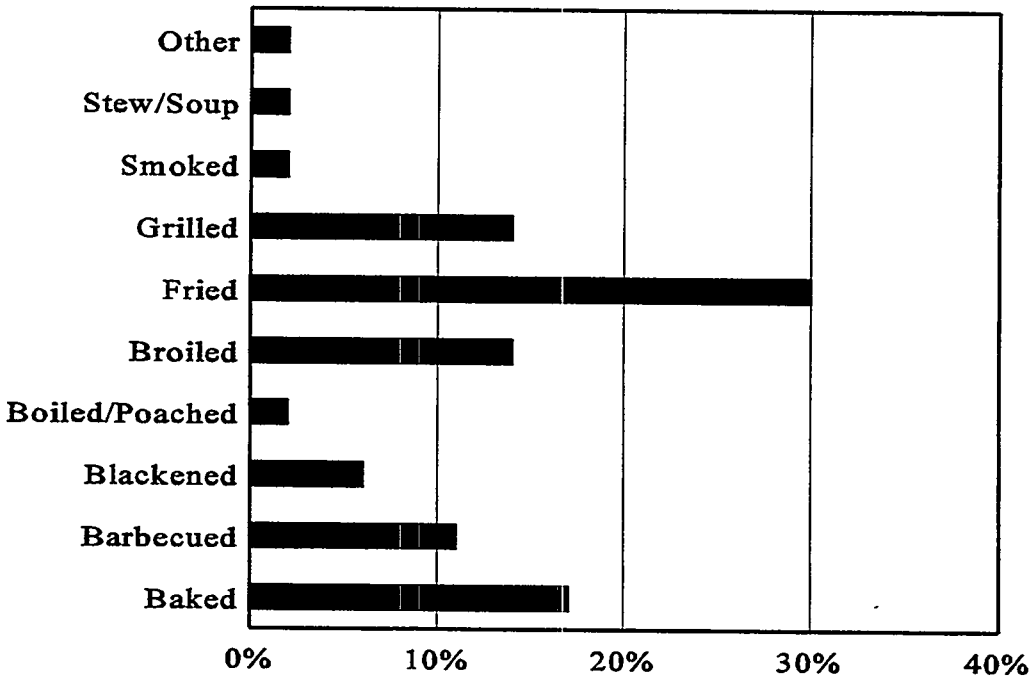

Figure 5.12. Frequency distribution of cooking methods used by Louisiana recreational fishermen.

5.3 Texas Recreational Fishermen Survey

Of the approximately 600,000 individuals holding saltwater sport fishing licenses issued by TPWD in 1993, 381 individuals (0.06%) were interviewed by FISHIE personnel.

5.3.1 Fishermen Profile

Texas recreational fishermen were asked questions regarding their fishing and seafood consumption habits as well as personal information. The fishermen responded that they primarily recreationally pursued finfish (97%), compared to 1.8% for crabbing, 1.3% for shrimping and 0.3% for oystering (**Figure 5.13**). Respondents indicated they possess an in-state fishing license (93%) rather than an out-of-state license (6%) or both types of licenses (0.8%) (**Figure 5.14**). The majority of respondents (93%) were white (**Figure 5.15**).

The mean number of seafood consumers in each household was 2.9 with an average mean of 1.7 males, 1.5 females and one child under the age of 18 years. The mean age of the adults in the household was 34 years. The respondents reported an average of 1.5 females of child bearing years.

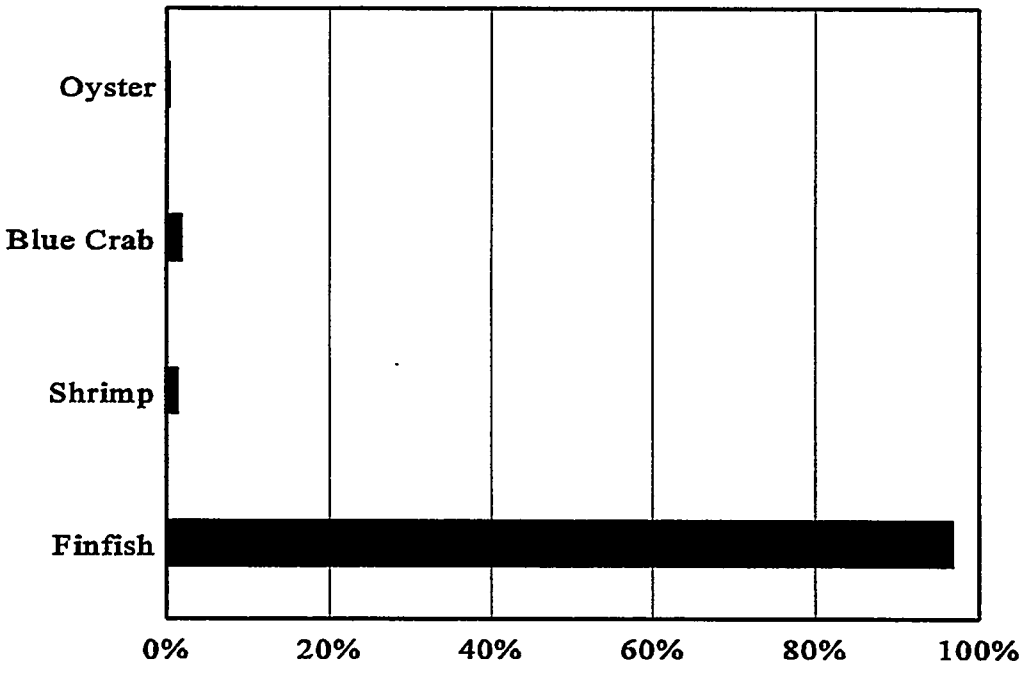

Figure 5.13. Frequency distribution of category fished for Texas recreational fishermen.

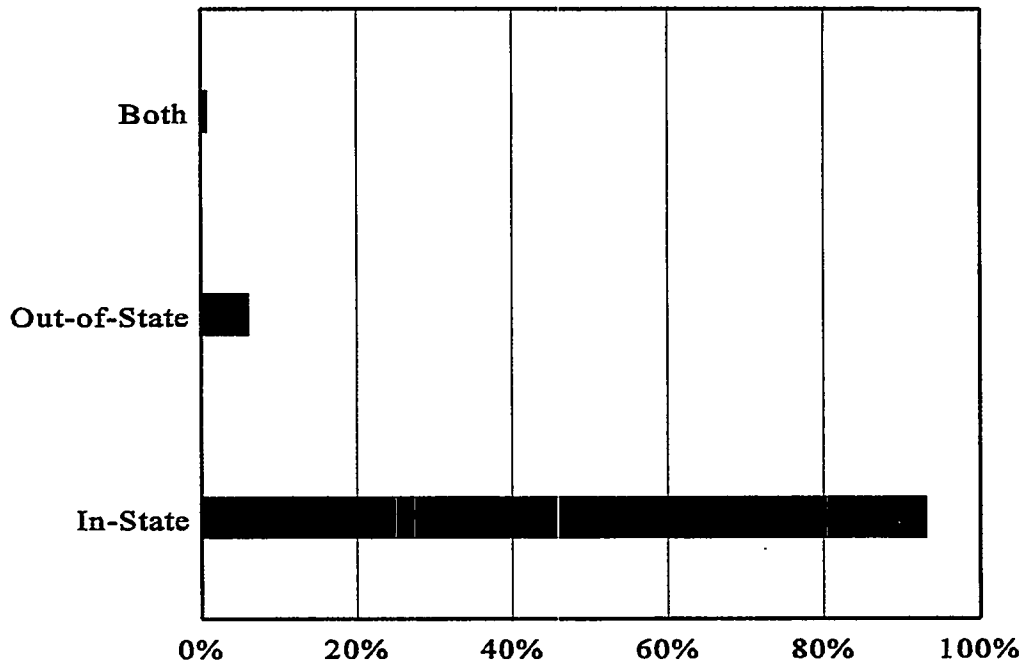

Figure 5.14. Frequency distribution of types of fishing licenses for Texas recreational fishermen.

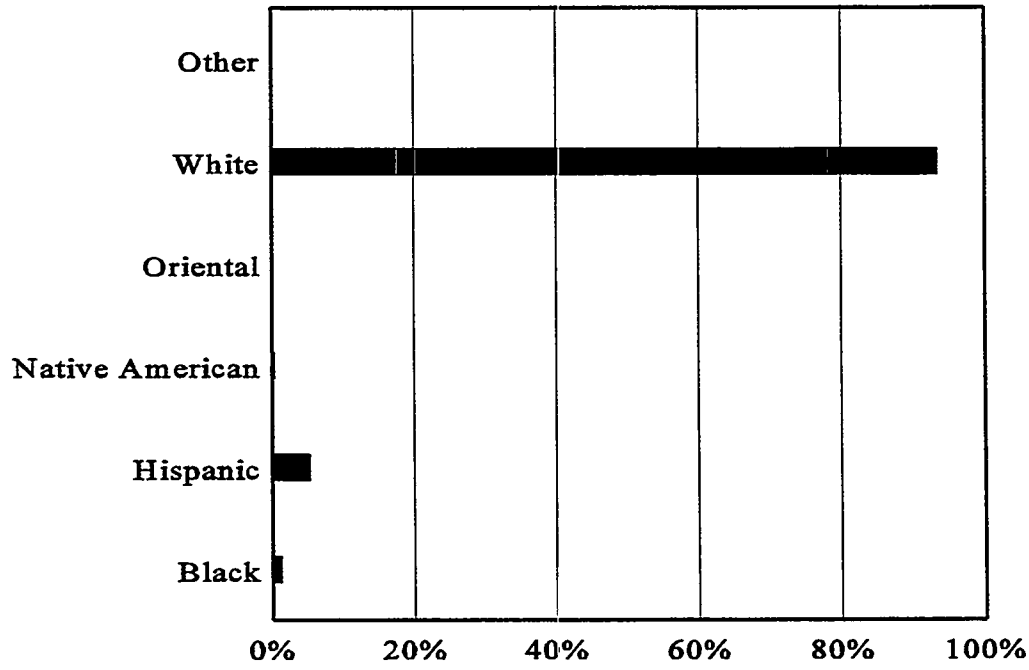

Figure 5.15. Frequency distribution of race for Texas recreational fishermen.

5.3.2 Mode of Fishing

The majority of the respondents fished in a private boat in either inshore waters (45%) or offshore waters (42%) (**Figure 5.16**). The mean number of fishing trips in the past three months was 11.6.

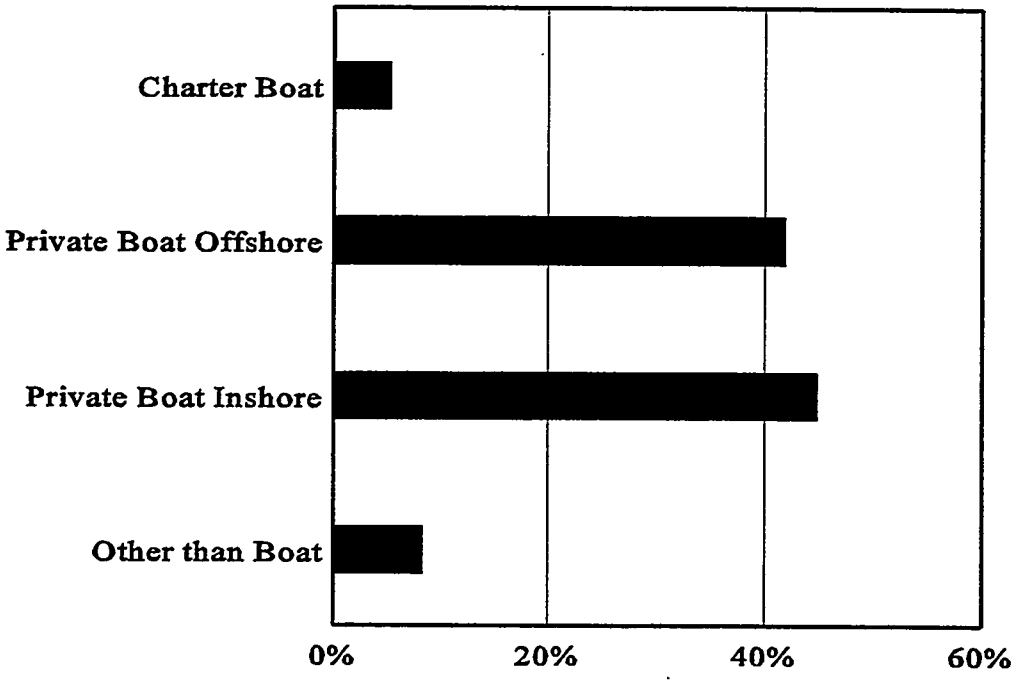

Figure 5.16. Frequency distribution of fishing mode for Texas recreational fishermen.

5.3.3 Location of Seafood Catch

Zone VIII was the most popular area fished (37%) followed closely by Zone VII (36%) and Zone IX (21%). Zone VI, along the Louisiana coast, was fished 4.9% of the time, but the other Louisiana zones (i.e., Zones I-V) were fished less than 0.5% of the time (**Figure 5.17**). Fishermen reported they primarily fished inshore (48%), although fishing offshore greater than 16 km (10 mi) was also common (40%) (**Figure 5.18**). A large percentage of fishermen (33%) fished within 300 m (1,000 ft) of an oilfield structure, although slightly more (39%) fished more than 1.6 km (1.0 mi) such a structure (**Figure 5.19**).

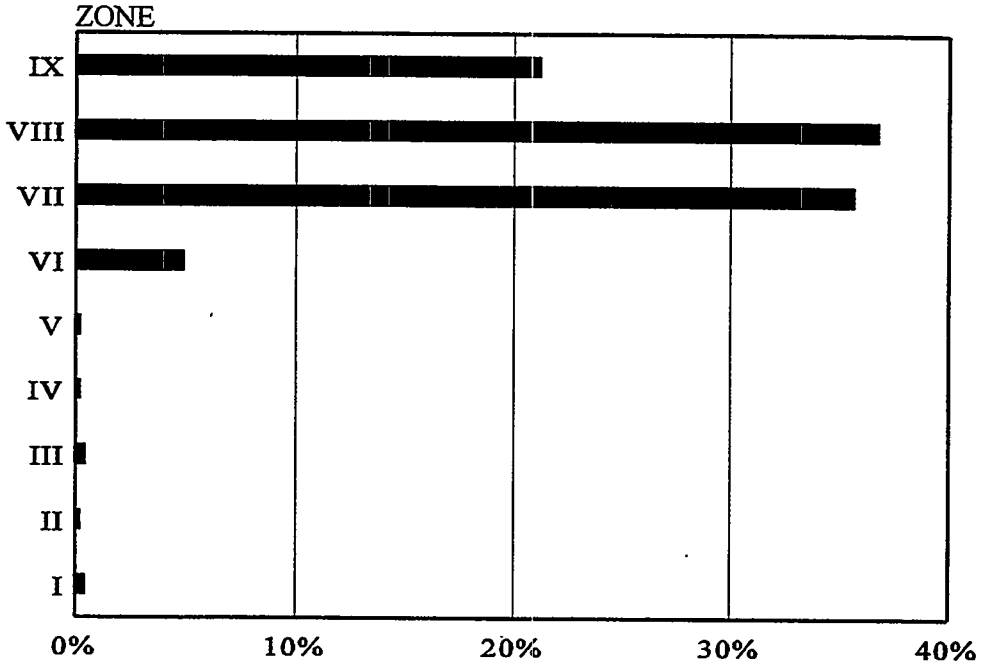

Figure 5.17. Frequency distribution of fishing zones for Texas recreational fishermen.

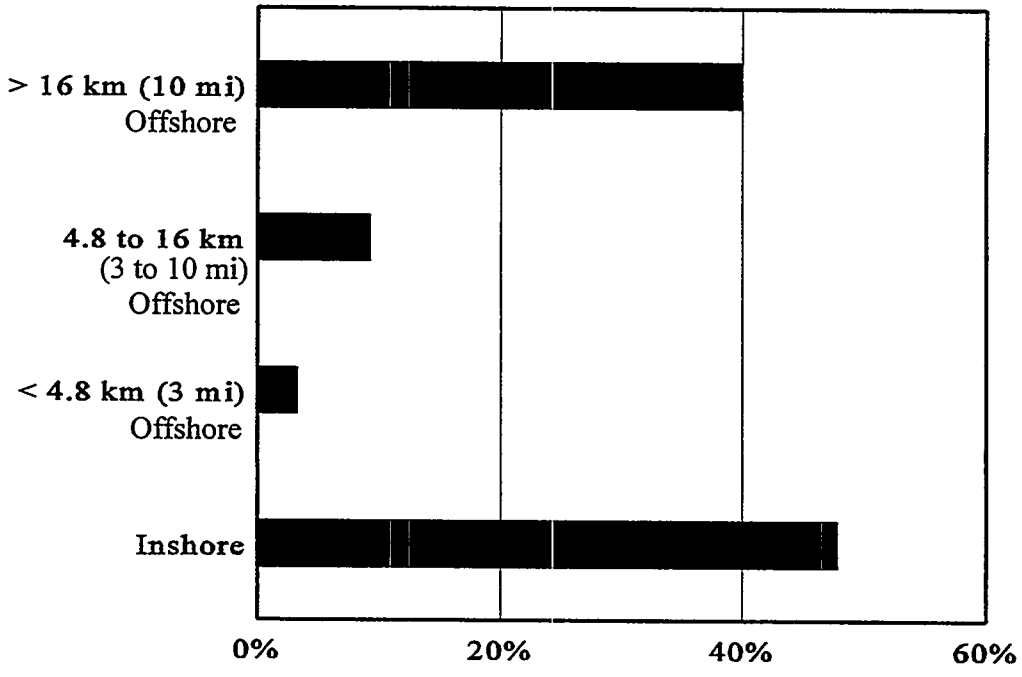

Figure 5.18. Frequency distribution of fishing location for Texas recreational fishermen.

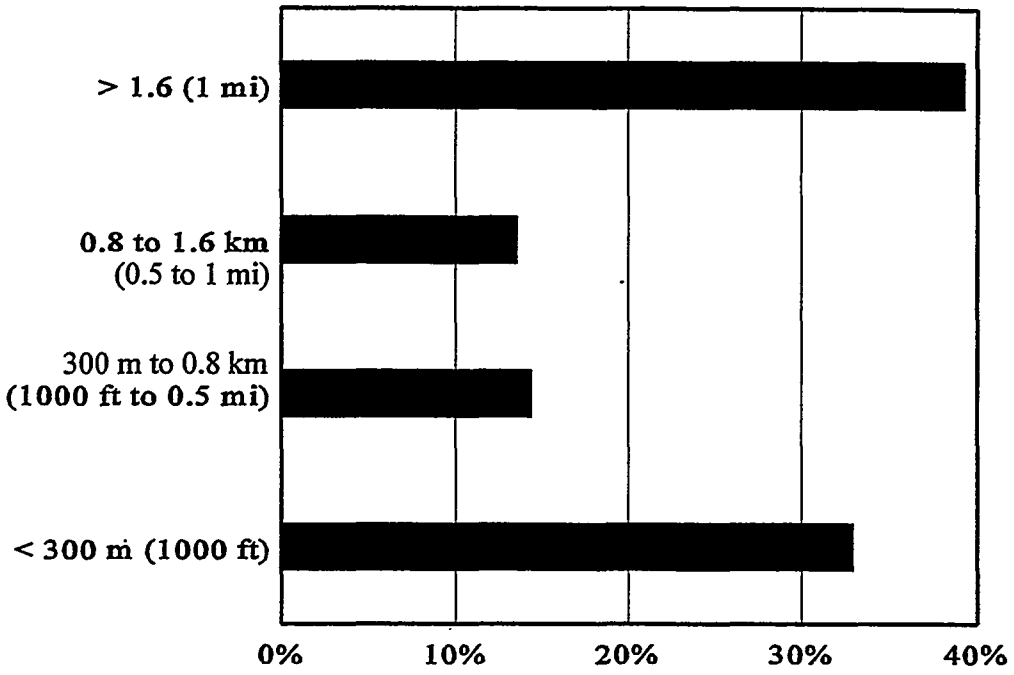

Figure 5.19. Frequency distribution of trips in proximity to oilfield structures for Texas recreational fishermen.

5.3.4 Species Caught and Distribution Patterns

The average number of shellfish and finfish caught by species among Texas recreational fishermen over the six-month period is given in **Figure 5.20**. The most common species caught was red snapper. Other species caught frequently included vermilion snapper, speckled trout and king mackerel. Estimates of the average weight of species caught are given in **Figure 5.21**.

Texas recreational fishermen were more likely to keep their catches of blue crabs (100%) and oysters (100%) than their catch of shrimp (62%). Finfish species caught were kept over 70% of the time. Flounder (92%) and redfish (90%) represented the most commonly retained fish, with speckled trout (88%), sheepshead (87%) and kingfish (87%) also representing coveted fish. Tuna (73%), king mackerel (76%), vermilion snapper (77%) and amberjack (77%) were less often kept by the respondents (**Figure 5.22**).

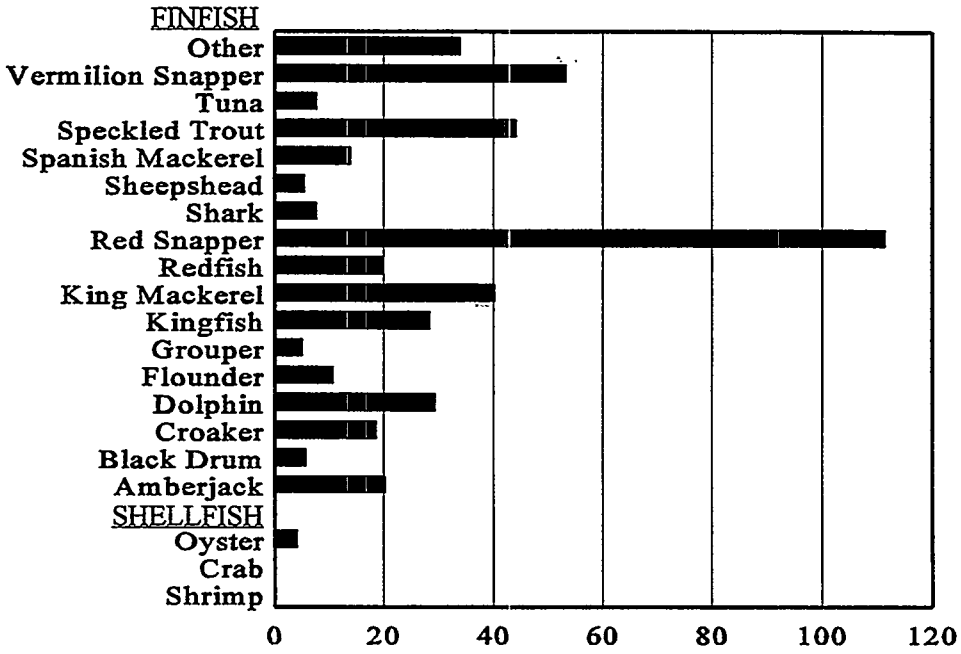

Figure 5.20. Average number of shellfish and finfish species caught by Texas recreational fishermen over a six month period.

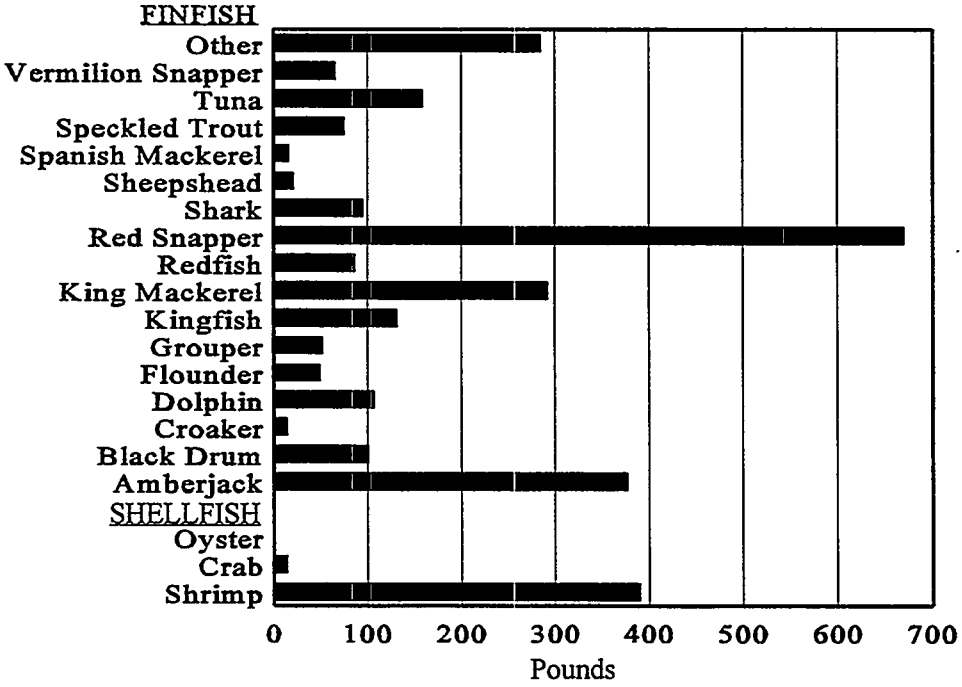

Figure 5.21. Estimates of average weight of shellfish and finfish species caught by Texas recreational fishermen over a six month period.

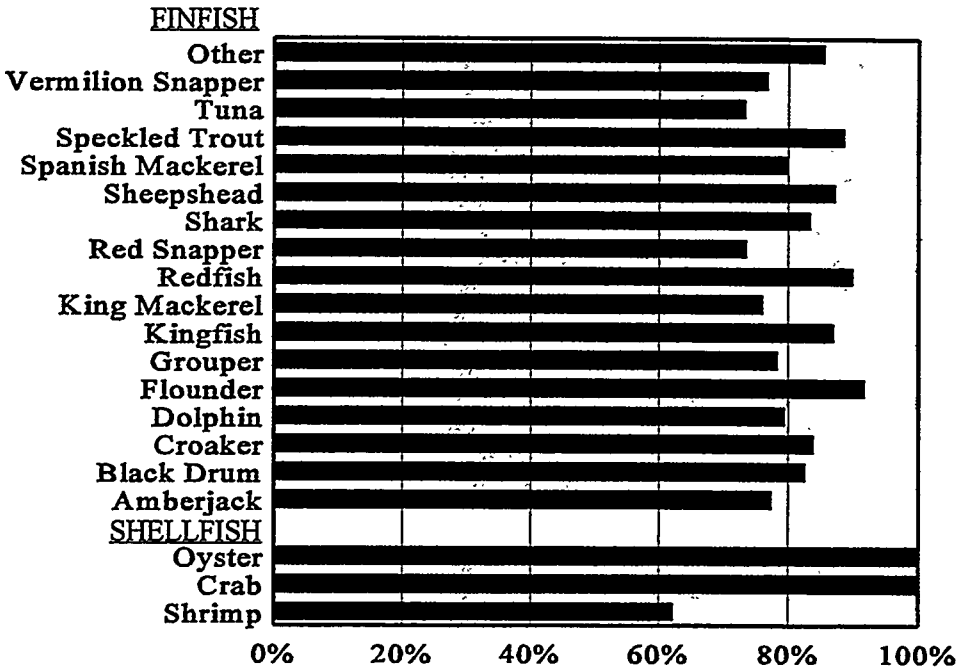

Figure 5.22. Average percentage of shellfish and finfish species kept for personal use by Texas recreational fishermen.

5.3.5 Consumption Patterns

The fishermen reported that they preferred to consume the meat portions of the finfish rather than the meat and the skin. Vermilion snapper (95%) and kingfish (93%) were consumed primarily as meat only. Other finfish species were consumed as meat only 73% to 84% of the time (**Figure 5.23**). Species most commonly eaten as meat with skin were flounder (27%), sheepshead (26%) and croaker (25%).

The finfish caught during the previous three months were served an average of 1.6 times per week. The respondents indicated that the last fish meal served from the catch in the previous three months was, on average, 5.3 days. The preferred method of cooking the seafood was fried (31%) followed by grilled (19%), broiled (16%), baked (13%) and barbecued (9%). Remaining methods of preparation were all less than 5% (**Figure 5.24**).

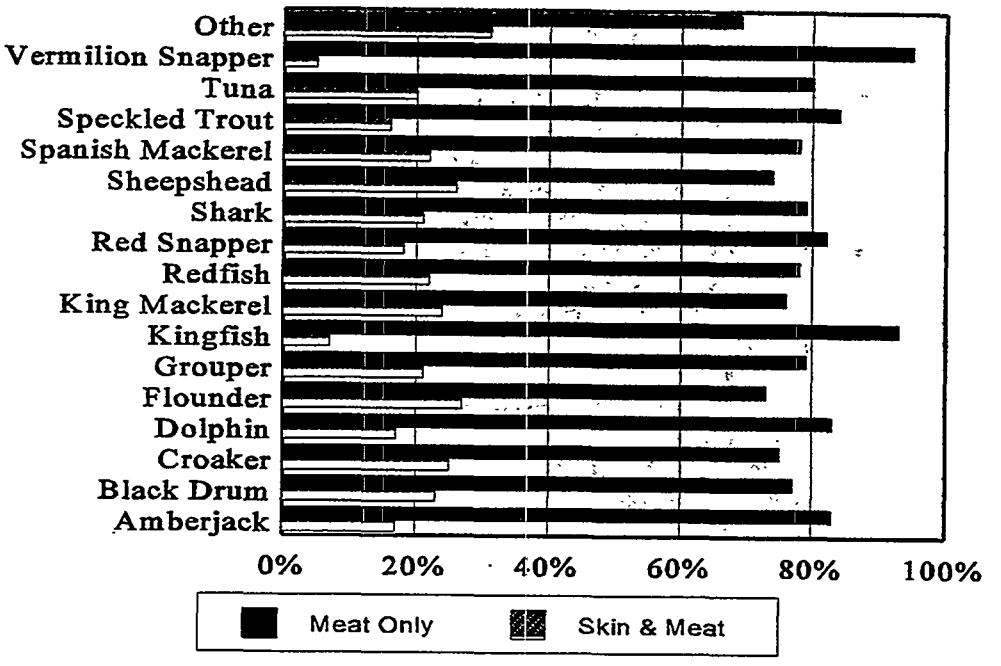

Figure 5.23. Percentage of finfish parts consumed by Texas recreational fishermen.

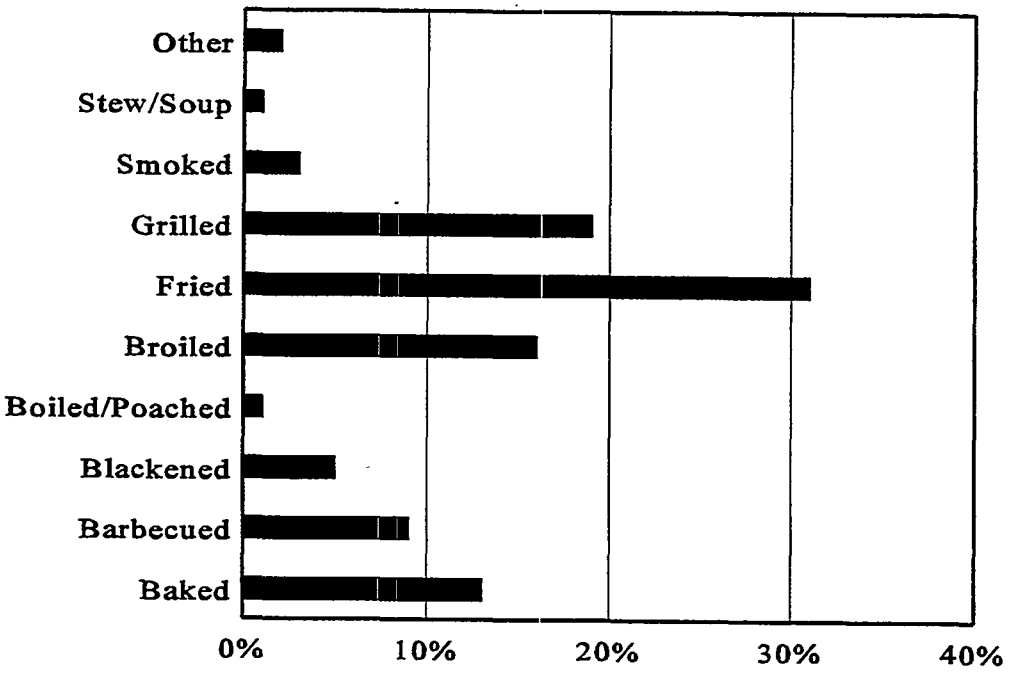

Figure 5.24. Frequency distribution of cooking methods used by Texas recreational fishermen.

5.4 Louisiana and Texas Commercial Fishermen Survey

In 1993, commercial fishing licenses issued by LDWF were held by 33,036 individuals. This is inclusive only of shrimpers, crabbers, oystermen and finfishermen. Of these, 146 (0.44%) were interviewed for this survey.

Texas commercial finfishermen (i.e., shrimpers, crabbers, oystermen and finfishermen) numbered 4,336 in 1993, based on TPWD data. Of these, 72 (1.66%) were interviewed for this survey.

5.4.1 Fishermen Profile

The Louisiana and Texas commercial fishermen profiled in this survey fished shrimp (77%), finfish (12%), crabs (8%) and oysters (4%), as shown in **Figure 5.25**. Of the respondents, the majority were white (65%), while 13% were of oriental origin and 13% were of Hispanic origin (**Figure 5.26**).

Average makeup of the household by gender was 2.2 males and 2.1 females. Females of child bearing age averaged 1.9 individuals. Average number of children (i.e., under age 18) was 2.4. Average age of adults was 37 years.

Of those residing in the household, a mean number of four individuals were seafood consumers. Seafood was served in the household 2.6 times per week on average.

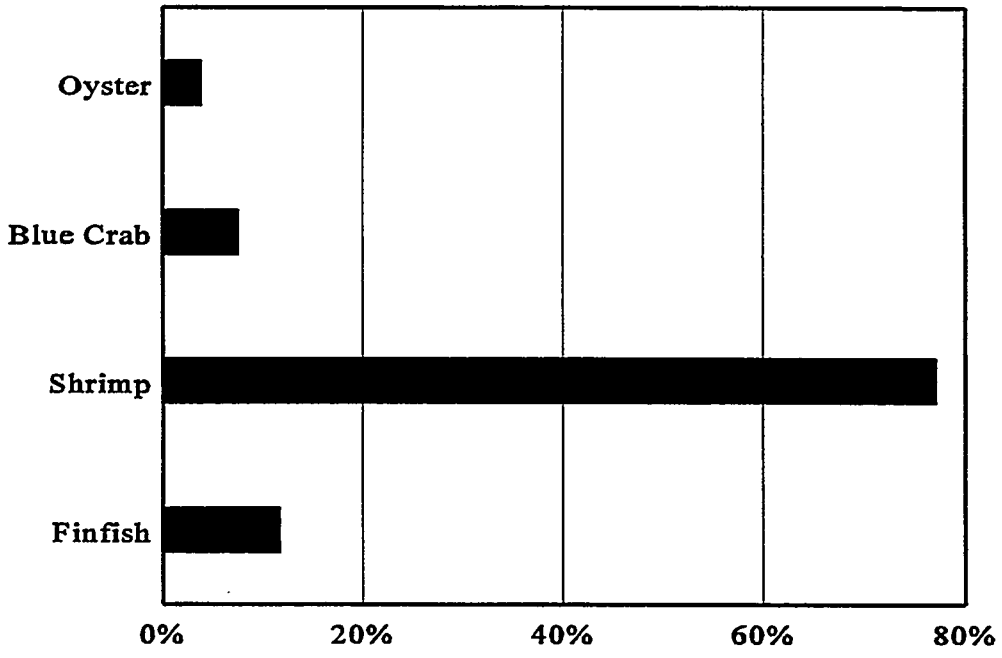

Figure 5.25. Frequency distribution of category fished for Louisiana and Texas commercial fishermen.

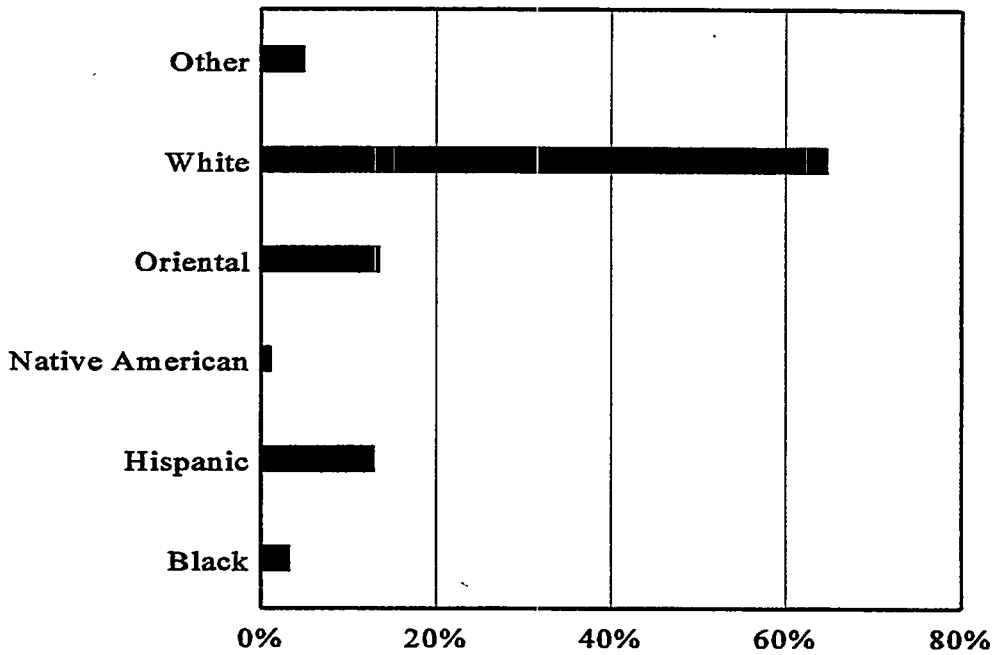

Figure 5.26. Frequency distribution of race for Louisiana and Texas commercial fishermen.

5.4.2 Location of Seafood Catch

The zones fished by Louisiana and Texas commercial fishermen is given in **Figure 5.27**. Zone III was the most fished area (20%) although the other zones were also frequently fished. The number of days fished in the last three months averaged 45.

Frequency of fishing location, which is shown in **Figure 5.28**, was largely inshore (39%) with frequent fishing also reported 4.8 to 16 km (3 to 10 mi) offshore (21%) and greater than 16 km (10 mi) offshore (28%). Of all fishing trips, frequency of trips in proximity to oilfield structures is shown in **Figure 5.29**. Of all trips, 33% were within 300 m (1,000 ft) of an oilfield structure. By comparison, 24% were between 300 m and 0.8 km (1,000 ft and 0.5 mi) of an oilfield structure, while 21% were between 0.8 and 1.6 km (0.5 and 1.0 mi) and 22% were more than 1.6 km (1.0 mi) from such a structure.

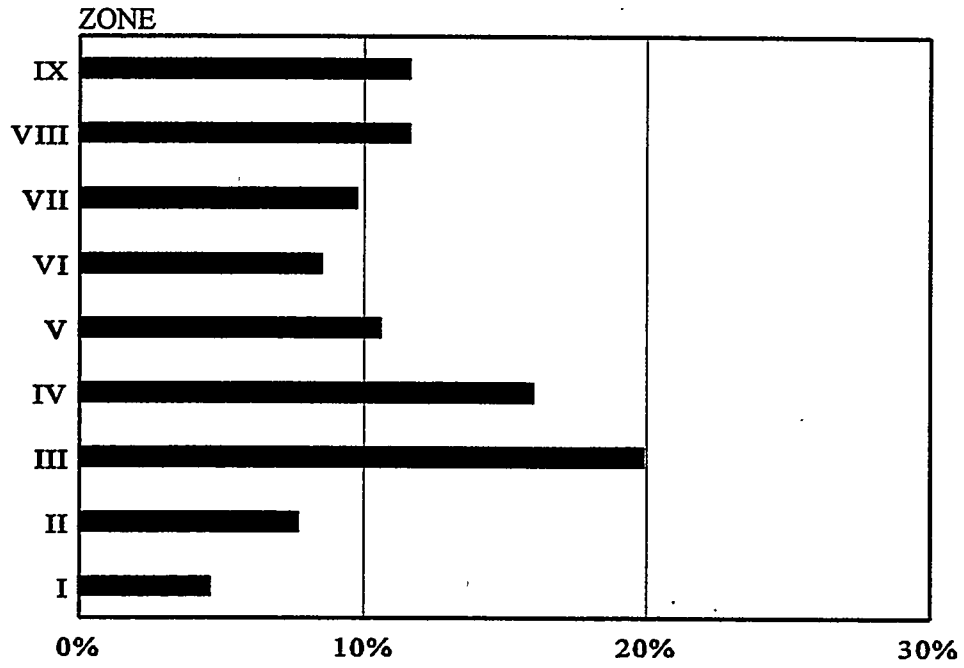

Figure 5.27. Frequency distribution of fishing zones for Louisiana and Texas commercial fishermen.

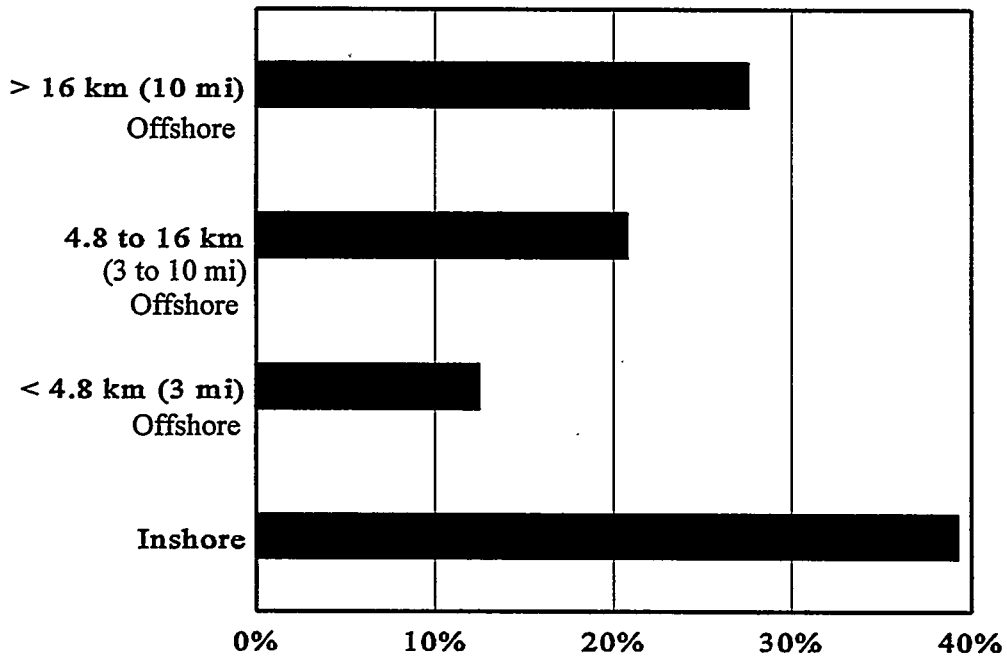

Figure 5.28. Frequency distribution of fishing location for Louisiana and Texas commercial fishermen.

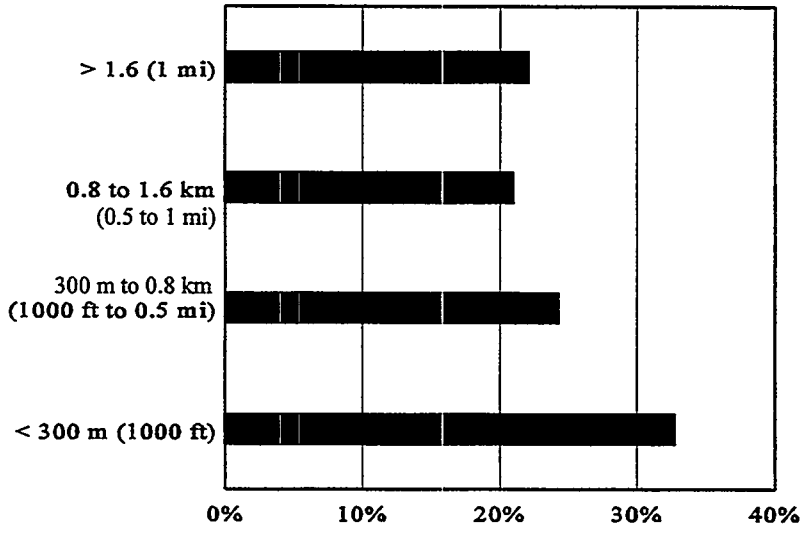

Figure 5.29. Frequency distribution of trips in proximity to oilfield structures for Louisiana and Texas commercial fishermen.

5.4.3 Species Caught and Distribution Patterns

Distribution of seafood catch by commercial fishermen is given in **Figures 5.30** and **5.31** by average percentage. These data clearly show that the majority of seafood caught was sold to either wholesaler/processors or retailers/restaurants. The predominate species which were given away included blue crabs and speckled trout. The predominate species which were kept for personal consumption included blue crab, amberjack, croaker, flounder, king mackerel, shark and speckled trout.

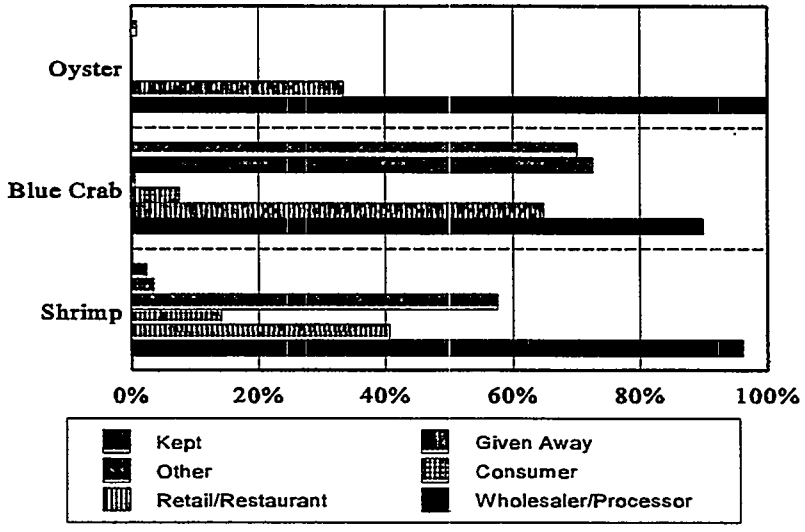

Figure 5.30. Average percentage of shellfish distribution for Louisiana and Texas commercial fishermen.

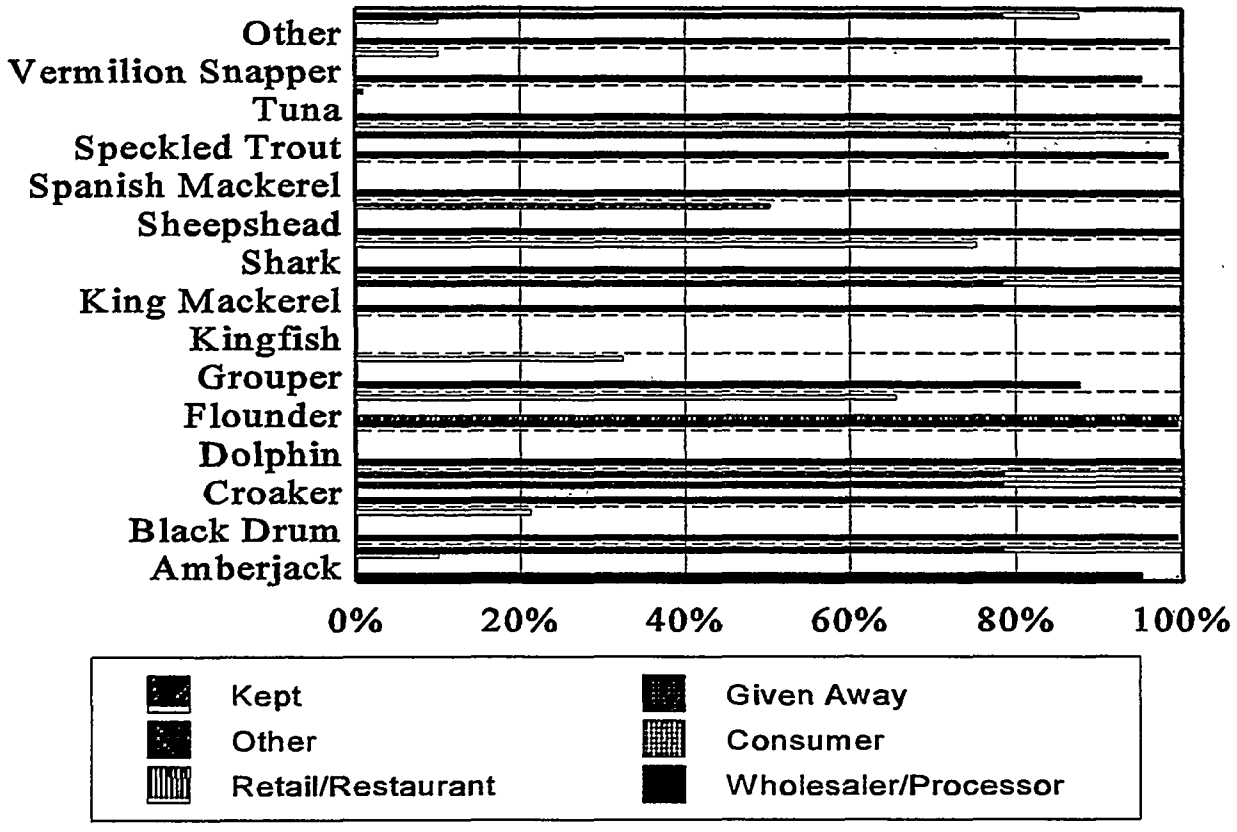

Figure 5.31. Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.

5.4.4 Consumption Patterns

The personal consumption patterns of Louisiana and Texas commercial fishermen are shown in **Figure 5.32.** Most of the species were consumed by the fishermen in the form of meat only, particularly croaker (100%), redfish (100%), red snapper (100%) and shark (100%). Only amberjack and king mackerel were eaten as meat and skin (100%).

The frequency distribution of the cooking methods used in the household for the seafood consumers is given in **Figure 5.33.** For the household consumption, fried was the most popular method of seafood preparation (29%), followed by boiled/poached (18%). The average number of days since the last seafood meal was prepared in the household was four.

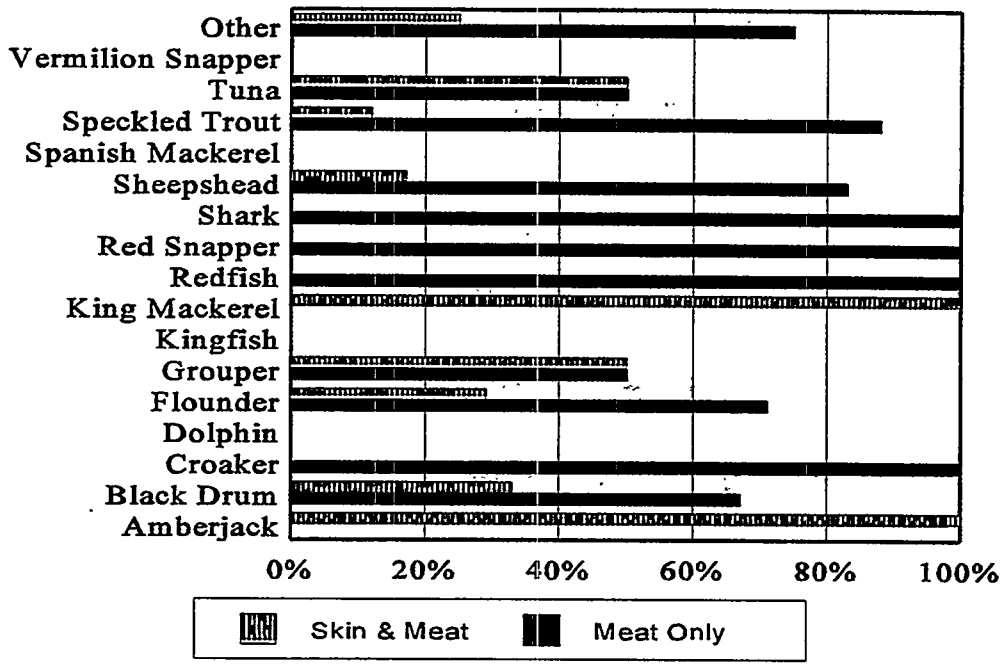

Figure 5.32. Percentage of finfish parts consumed by Louisiana and Texas commercial fishermen.

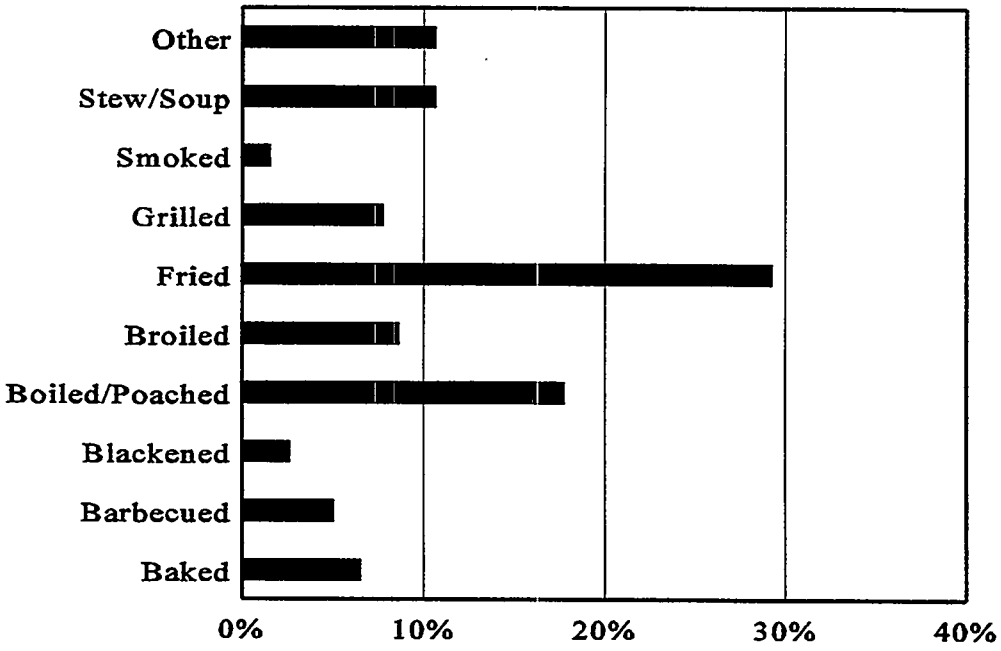

Figure 5.33. Frequency distribution of cooking methods used by Louisiana and Texas commercial fishermen.

5.5 Louisiana Oyster Fishermen Survey

The total number of licenses issued to resident oystermen in 1993 by LDWF was 1,027. Seventeen interviews (1.66%) were conducted by FISHIE in spring 1994.

5.5.1 Fishermen Profile

The Louisiana oyster fisherman profiled in this survey leased an average of 1,164 acres of water bottom from the state for oyster culture. Ninety-one percent of respondents were white with the remaining 9% of Hispanic origin (**Figure 5.34**). There was insufficient response to determine the type of fishing license held (e.g, in-state, out-of-state, etc.).

Average makeup of the household by gender was 1.6 males and 1.9 females. Females of child bearing age averaged 2.4 individuals. Average number of children (under age 18) was three. Average age of adults was 47 years. Of those residing in the household, a mean number of 3.1 individuals were oyster consumers.

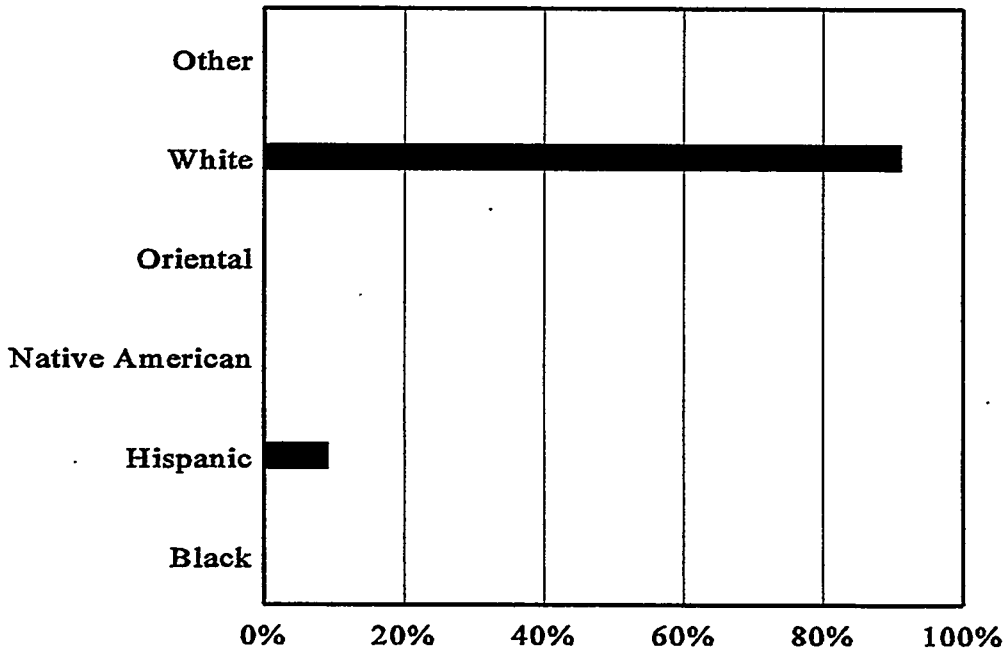

Figure 5.34. Frequency distribution of race for Louisiana oystermen.

5.5.2 Location of Seafood Catch

The Louisiana oystermen surveyed fished primarily in Zone I although there was some fishing conducted in Zones III and IV (**Figure 5.35**). The number of days fished in the last three months averaged 37. Frequency of fishing location, which is shown in **Figure 5.36**, was largely inshore (94%) with some fishing reported 4.8 to 16 km (3 to 10 mi) offshore. Frequency of trips in proximity to oilfield structures is shown in **Figure 5.37**. Approximately 60% of all trips were within 0.8 km (0.5 mi) of an oilfield structure.

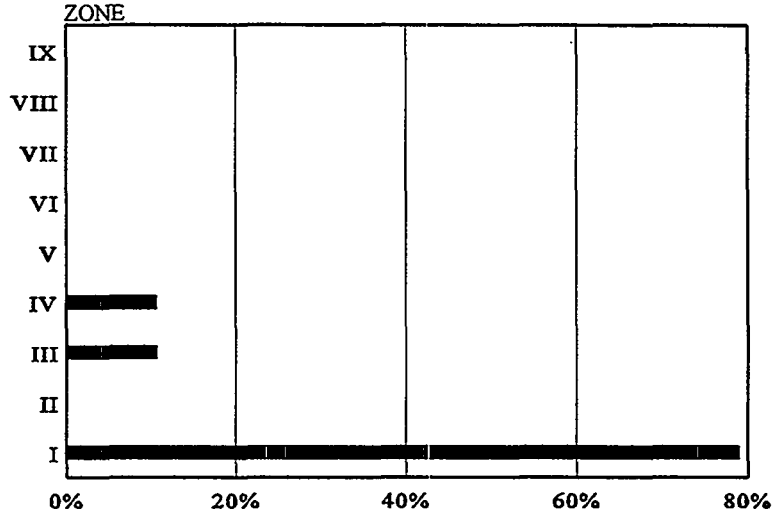

Figure 5.35. Frequency distribution of fishing zones used by Louisiana oystermen.

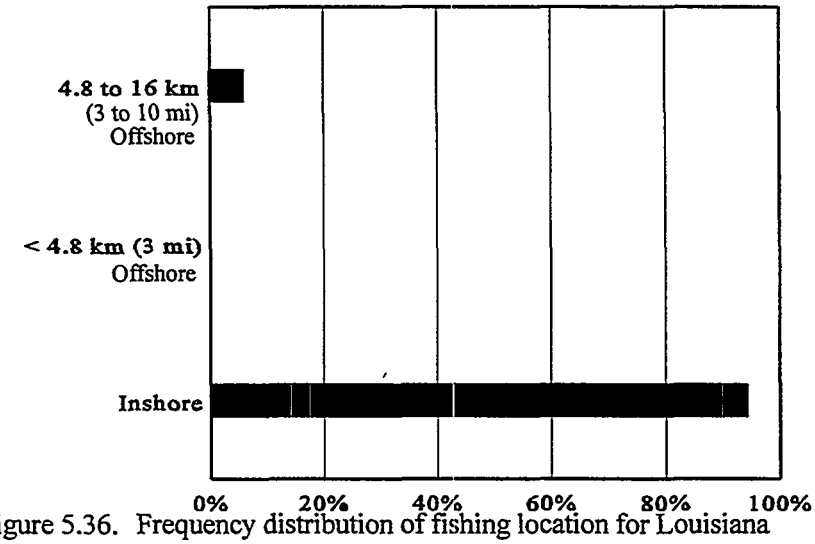

Figure 5.36. Frequency distribution of fishing location for Louisiana oystermen.

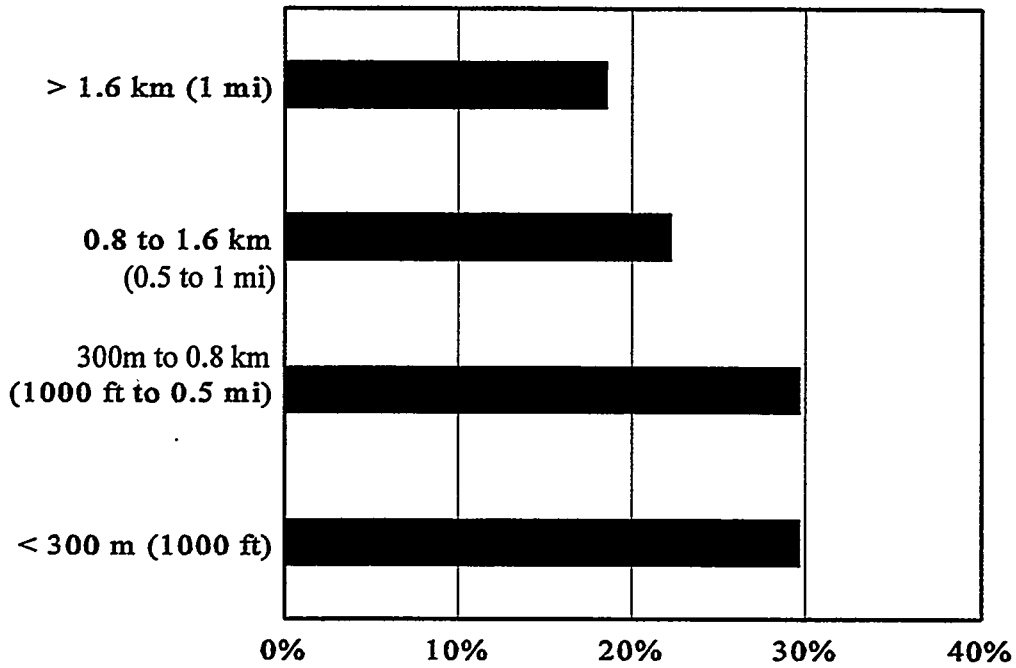

Figure 5.37. Frequency distribution of trips in proximity to oilfield structures for Louisiana oystermen.

5.5.3 Distribution Patterns

Oystermen reported that 99% of all oysters fished during the previous 90 days were sold to wholesaler/processors and 1% were retained for household consumption.

5.5.4 Consumption Patterns

Oysters were served in the household three times per week on average. The frequency distribution of the cooking methods used in the household for the oyster consumers is given in **Figure 5.38.** For household consumption, fried was the most popular method of oyster preparation (30%), followed by raw (28%) and stewed or in soups (26%). For the oysterman himself, the most popular method of preparation of oysters was raw (49%). The average number of days since the last oyster meal was prepared in the household was 7.6 days.

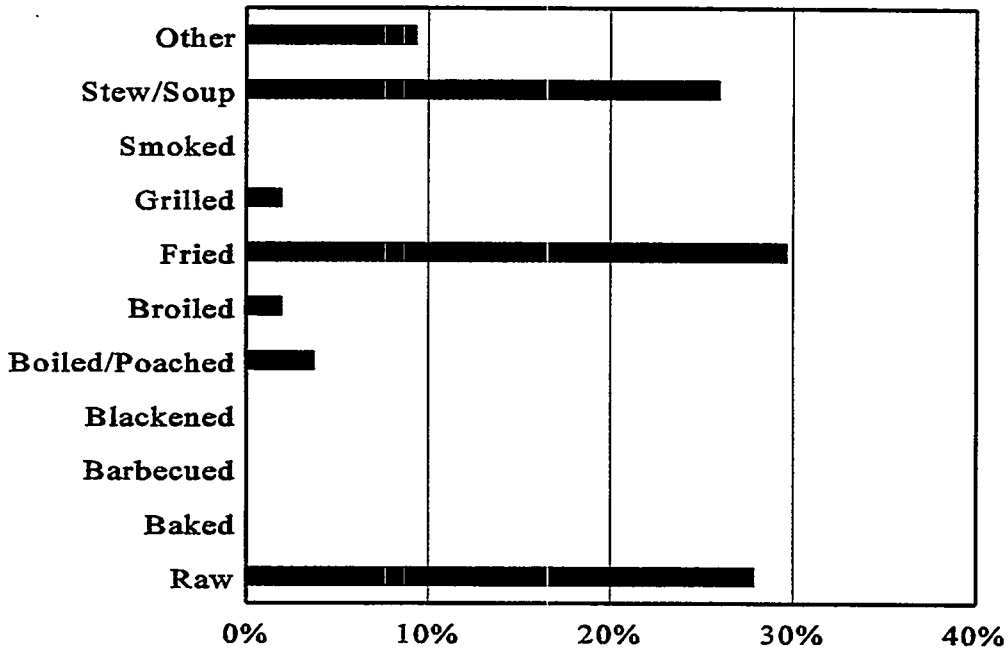

Figure 5.38. Frequency distribution of methods of cooking oysters for consumption by Louisiana oystermen.

5.6 Texas Oyster Fishermen Survey

Eleven licenses were issued to oystermen by TPWD in 1993/1994. Sixteen oystermen interviews were conducted by FISHIE.

5.6.1 Fishermen Profile

The number of acres of water bottom leased from the state by the Texas oyster fishermen profiled in this study could not be determined due to insufficient responses. One hundred percent of the oyster fishermen interviewed held in-state fishing licenses. The racial mix of Texas oystermen surveyed is given in **Figure 5.39**. Sixty percent of respondents were of Hispanic origin with the remaining respondents being equally divided among black, white and Native American (13% each).

Average makeup of the household by gender was 1.6 males and 1.7 females. Females of child bearing age averaged 2.2 individuals. Average number of children (under age 18) was 1.6. Average age of adults was 32 years. Of those residing in the household, a mean number of 2.9 individuals are oyster consumers.

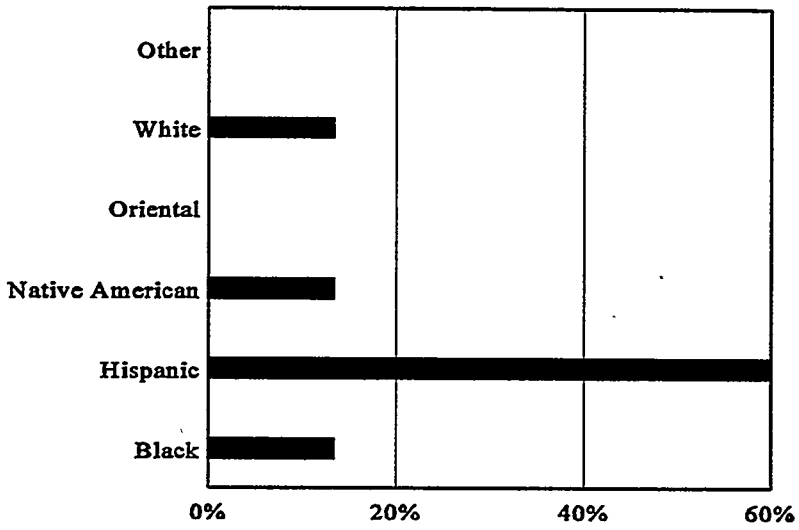

Figure 5.39. Frequency distribution of race for Texas oystermen.

5.6.2 Location of Seafood Catch

The Texas oystermen surveyed fished primarily in Zone VII, although there was some fishing conducted in Zones II and III (**Figure 5.40**). The number of days fished in the last three months averaged 14. The frequency of fishing location was exclusively inshore. For those trips during which oysters were fished, the frequency of trips in proximity to oilfield structures is shown in **Figure 5.41** for all respondents. For all trips evaluated, 58% were beyond 1.6 km (1.0 mi) from an oilfield structure while 37% were between 0.8 and 1.6 km (0.5 and 1.0 mi) from such a structure.

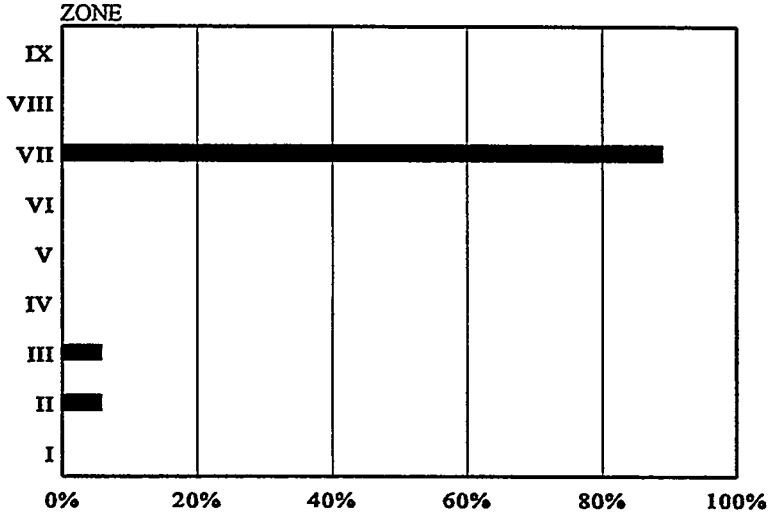

Figure 5.40. Frequency distribution of fishing zones used by Texas oystermen.

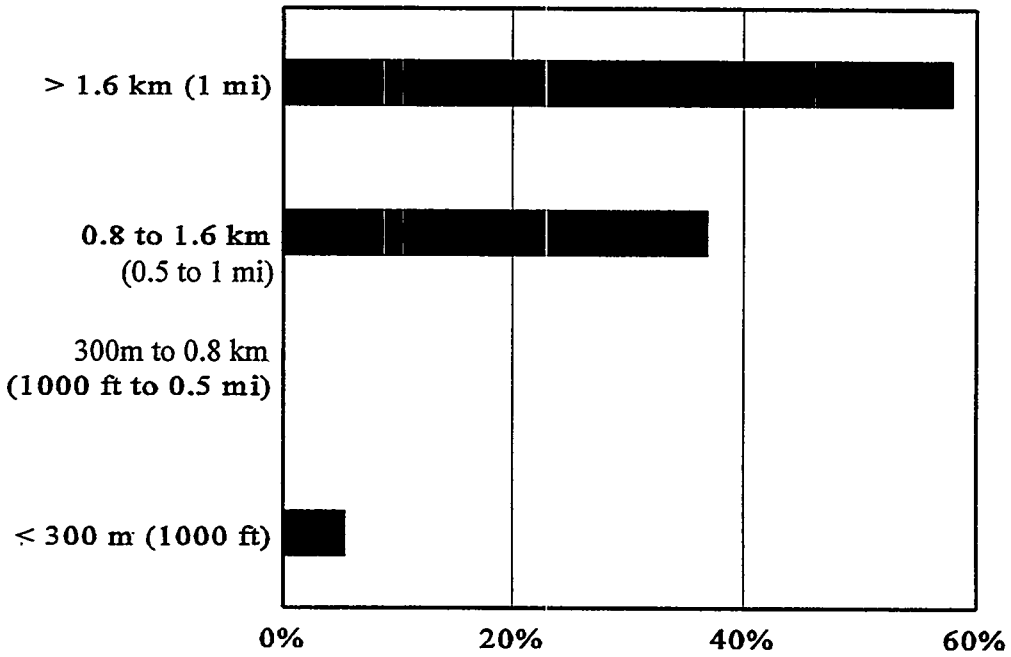

Figure 5.41. Frequency distribution of trips in proximity to oilfield structures for Texas oystermen.

5.6.3 Distribution Patterns

Oystermen reported that 100% of all oysters fished during the previous 90 days were sold to wholesaler/processors.

5.6.4 Consumption Patterns

Oysters were served in the household 2.3 times per week on average. For the household consumption, fried was the most popular method of oyster preparation (36%), followed by raw (31%). For the oysterman himself, the most popular method of preparation of oysters was raw (42%). The average number of days since the last oyster meal was prepared in the household was 4.4 days. The frequency distribution of cooking methods used in the household for the oyster consumers is given in **Figure 5.42.**

Figure 5.42. Frequency distribution of methods of cooking oysters for consumption by Texas oystermen.

5.7 Louisiana Wholesalers and Processors Survey

A total of 300 wholesalers/processors dealing in saltwater species were operational in Louisiana, according to numbers obtained from NMFS. Questionnaires were sent to all of these wholesalers/processors and 74 (24.7%) responses were returned.

5.7.1 Sources of Saltwater Seafood

Among respondents to the Louisiana Wholesalers and Processors Survey, 5.3% act as a processor only, 52% operate as a wholesaler/dealer only and 42% function as both wholesalers and processors. Their typical source of seafood was in-state commercial fisherman with generally greater than 33% of the finfish, crabs, oysters and shrimp received from this group. Approximately 25% of blue crabs and 10% of finfish were obtained from other in-state processors. Approximately 6% of shrimp and 19% of finfish were obtained from out-of-state sources. Imports from other countries provided less than 6% of the seafood (**Figure 5.43**).

The wholesalers/processors indicated that their sources of seafood fished in both inshore and offshore locations. Of those sources fishing inshore, 56% of them fished near an oilfield structure. Of those sources fishing offshore, 72% fished near an oilfield structure (**Figure 5.44**). Fishing Zone IV provided nearly 28% of the seafood received at the wholesaler/processor, with Zone III contributing 22% and Zone V supplying 16%. The remaining zones in Louisiana (i.e., Zones I and VI) and all zones off Texas (i.e., Zones VII-IX) each furnished less than 7% of the catch (**Figure 5.45**).

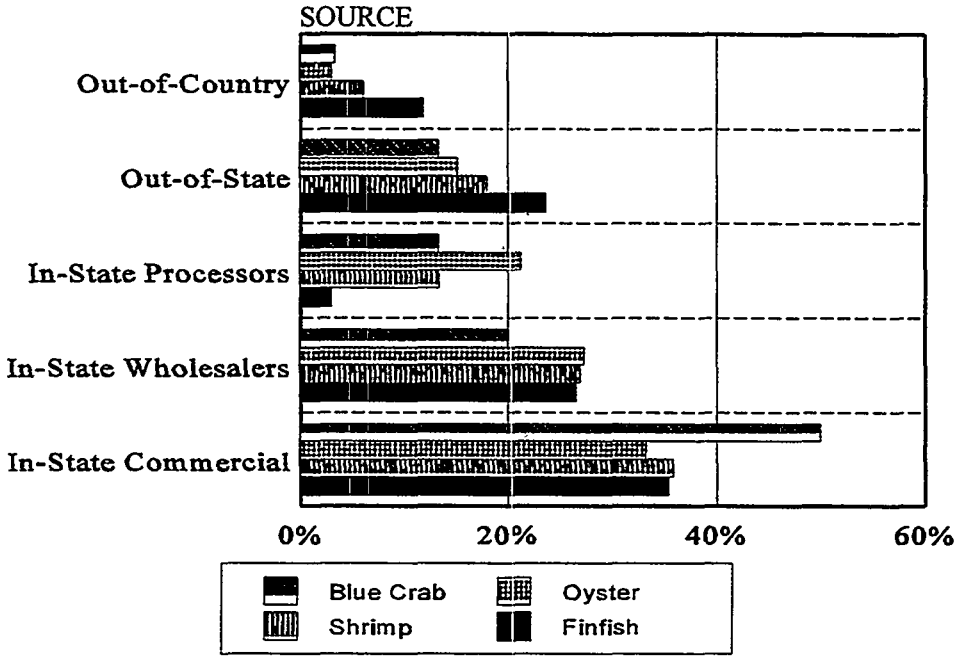

Figure 5.43. Frequency distribution of sources of seafood for Louisiana wholesalers/processors.

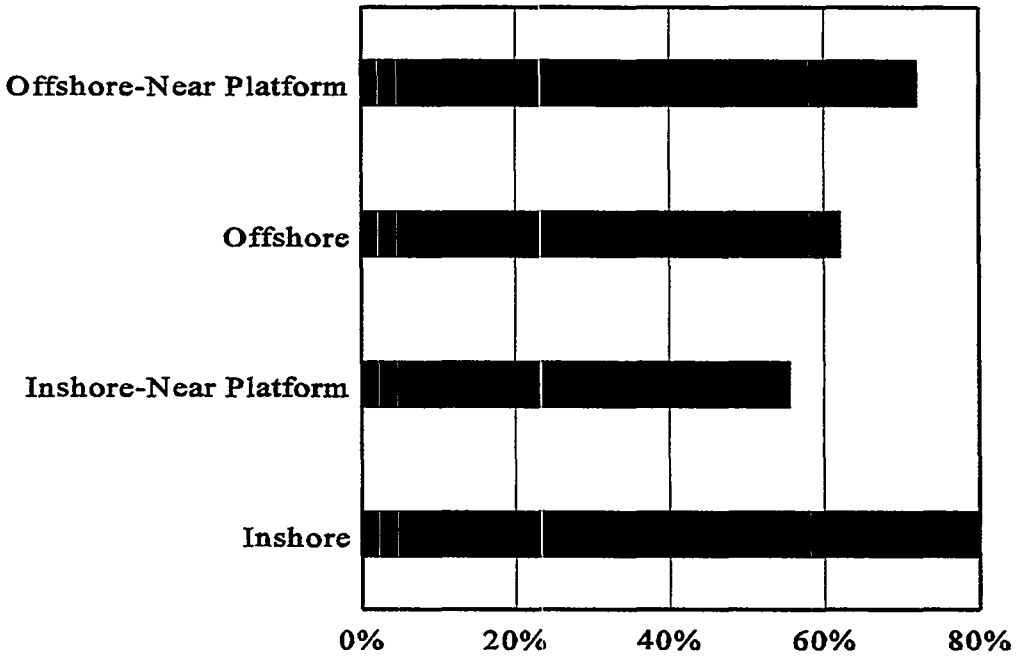

Figure 5.44. Average percent of suppliers' fishing location for Louisiana wholesalers/processors.

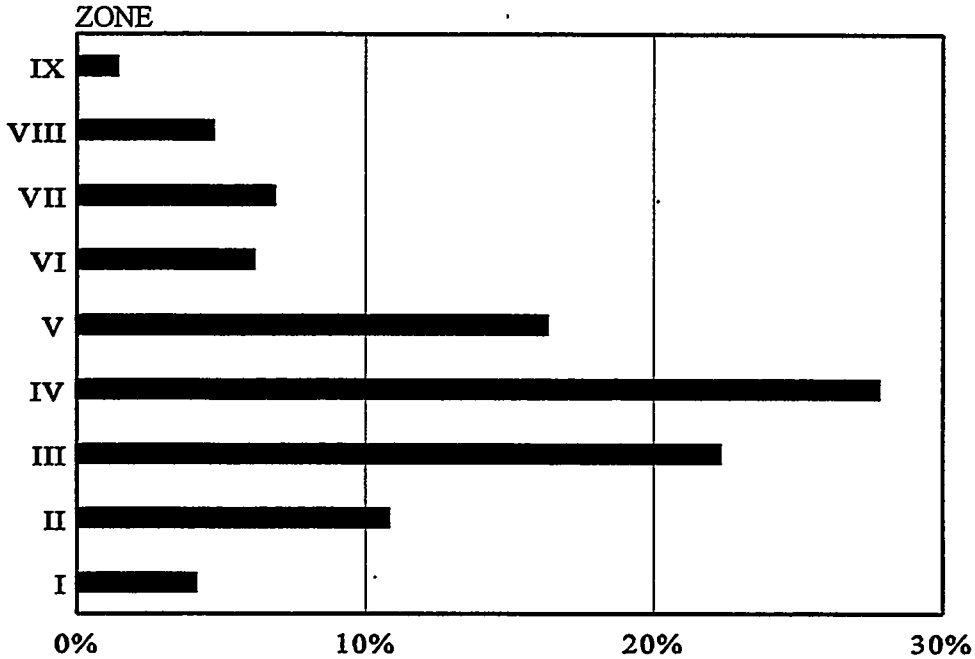

Figure 5.45. Frequency distribution of suppliers' fishing zones for Louisiana wholesalers/processors.

5.7.2 Quantity of Seafood Obtained

The average quantity of saltwater finfish received by the wholesalers/processors was 307,600 kg (678,141 lb) of whole fish and 31,720 kg (69,930 lb) of fish parts. Shrimp averaged 605,624 kg (1,335,173 lb) for heads-on and 173,173 kg (381,782 lb) for heads-off. Oysters in the shell accounted for 486,150 sacks, representing 11,470 kg (25,287 lb) of meat or 9,958 liters (2,631 gal). Average weights or quantities for blue crabs included 224,400 kg (494,717 lb) for hard shell, 4,412 doz for soft shell, and 30,054 kg (66,257 lb) for blue crab meat. Thirty percent of shrimp and 53% of soft shell blue crabs were sold to in-state retailers and restaurants.

5.7.3 Distribution Patterns

The Louisiana wholesalers/processors sent less than 33% of their shellfish out-of-state. Thirty-two percent of hard shell blue crabs and 30% of the blue crab meat were shipped out-of-state. Twenty-seven percent of shrimp were transported out-of-state. Eleven percent of hard shell blue crabs and 29% of oysters were sold to wholesalers/dealers. Any small percentages of shellfish were transported to processing plants (**Figure 5.46**).

Twenty-five percent of black drum, flounder, red snapper and speckled trout and 40% of vermilion snapper were sold to out-of-state sources. Fifty percent of red snapper, 40% of tuna and 40% of vermilion snapper were sold to other in-state wholesalers/dealers. Forty-four percent of flounder, 42% of speckled trout, 33% of black drum and 31% of sheepshead were sold to in-state retailers/restaurants. Few species of finfish were sold to in-state processing plants (**Figure 5.47**).

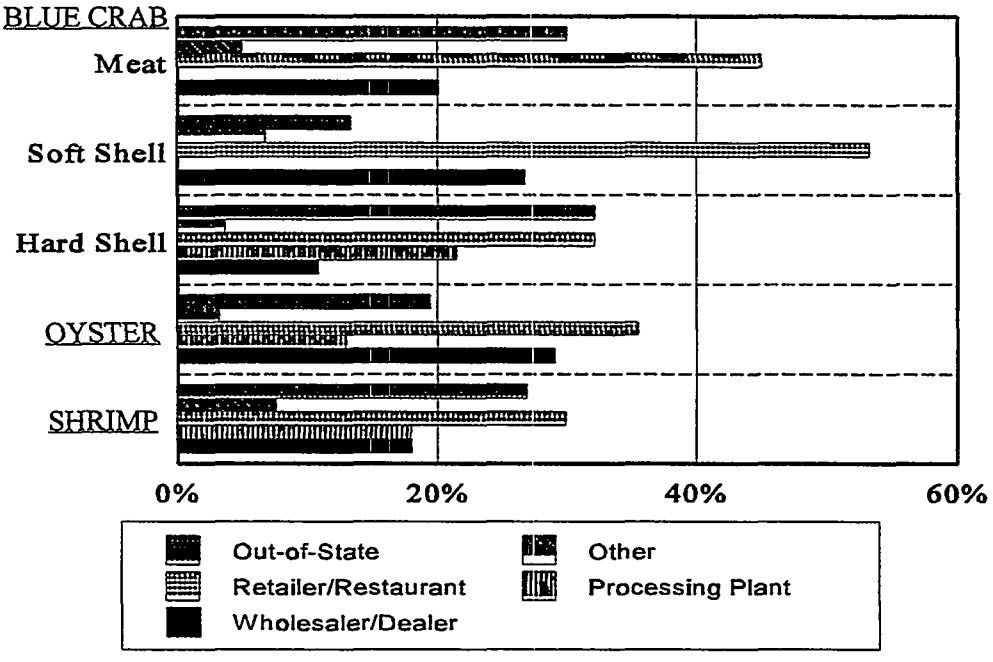

Figure 5.46. Frequency distribution of shellfish destinations from Louisiana wholesalers/processors.

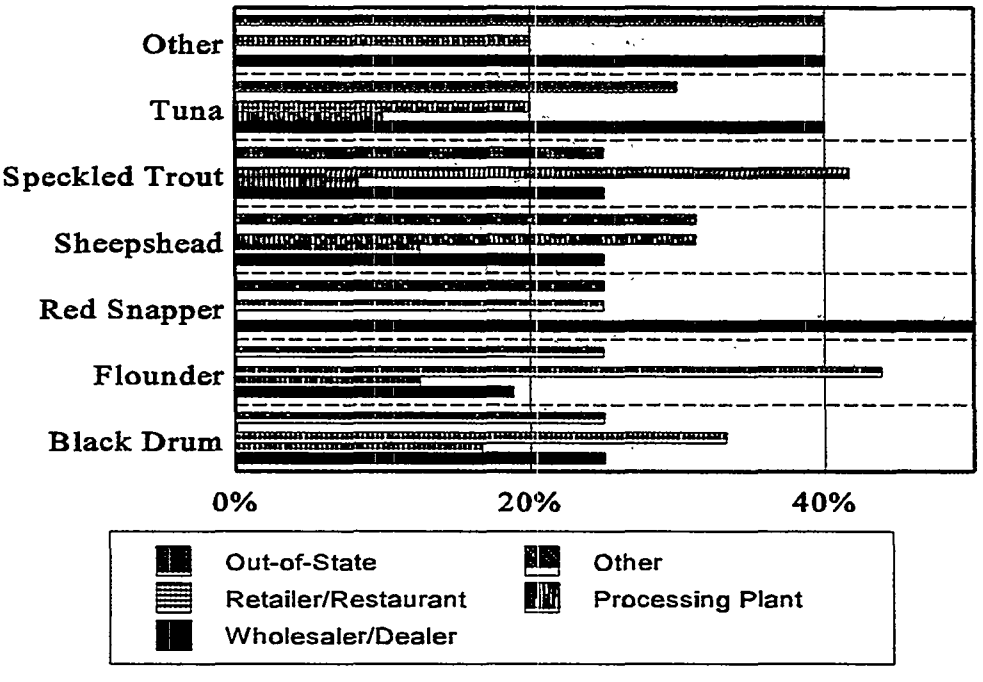

Figure 5.47. Frequency distribution of saltwater finfish destinations from Louisiana wholesalers/processors.

5.7.4 Product Form of Seafood Sold

The seafood was sold in a variety of forms. Oysters were most often sold shucked (55%), in the shell (39%) or prepared (7%). Blue crabs were sold whole (47%), as meat (44%) and prepared (8%). Shrimp were sold in the form of heads-on (32%), heads-off (30%), peeled and undeveined (21%), peeled and deveined (12%) and prepared (such as breaded for frying) (5%) (**Figure 5.48**). Over 55% of finfish species were sold whole. Flounder and tuna, at 79% and 71%, respectively, were commonly sold whole. Speckled trout were marketed as whole fish 56% of the time, filleted with no skin 31% of the time, filleted but with skin 6% of the time, or marketed in some other form 6% of the time. Approximately 20% to 30% each of sheepshead, black drum and red snapper were also sold filleted with no skin (**Figure 5.49**).

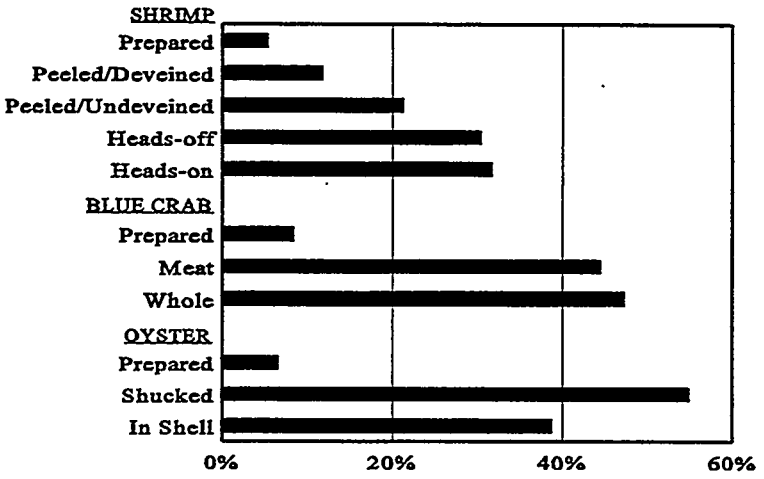

Figure 5.48. Frequency distribution of shellfish product sold by Louisiana wholesalers/processors.

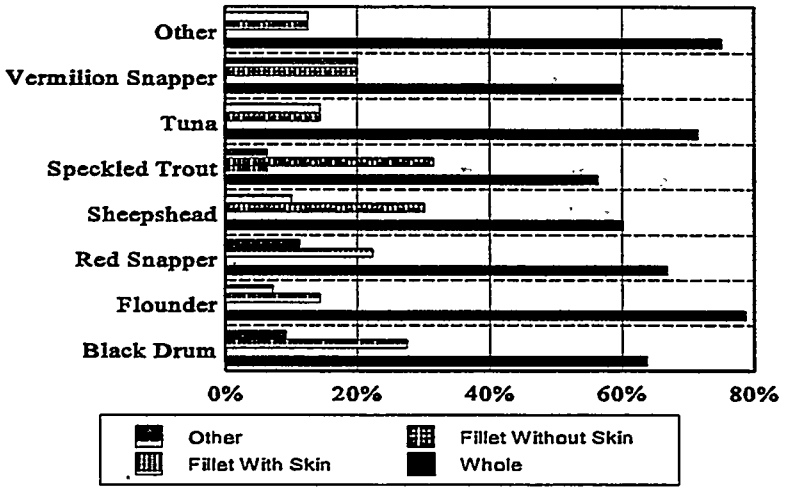

Figure 5.49. Frequency distribution of finfish product sold by Louisiana wholesalers/processors.

5.8 Texas Wholesalers and Processors Survey

The TPWD reported 420 wholesalers/processors dealing in saltwater species in Texas in 1993. Questionnaires were sent to all of these wholesalers/processors and 21 (5.0%) completed surveys were received.

5.8.1 Sources of Saltwater Seafood

Among respondents to the Texas wholesalers and processors survey, 6% act as a processor only, 53% operate as a wholesaler/dealer only and 41% function as both wholesalers and processors. Their typical source of seafood was in-state commercial fisherman and in-state wholesalers/dealers with generally greater than 25% of the finfish, crabs, oysters and shrimp received from these groups. Approximately 25% of blue crabs and 10% of finfish were obtained from other in-state processors. Approximately 6% of shrimp and 19% of finfish were obtained from out-of-state sources. Imports from other countries provided 13% of the shrimp and 19% of the finfish (**Figure 5.50**).

The wholesalers/processors indicated that their sources of seafood fished in both inshore and offshore locations. Of those sources fishing inshore, 30% of them fished near an oilfield structure. Of those sources fishing offshore, 54% fished near an oilfield structure (**Figure 5.51**). Fishing Zone VII provided 34% of the seafood received at the wholesaler/processor, with Zone VIII contributing 31% and Zone IX supplying 21%. The zones in Louisiana each furnished less than 7% of the catch (**Figure 5.52**).

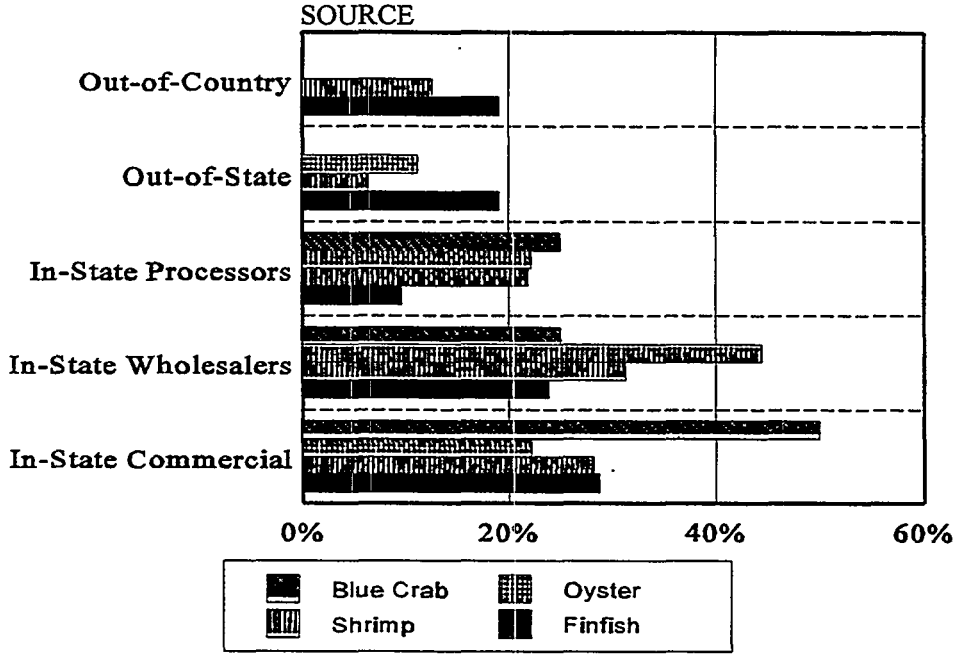

Figure 5.50. Frequency distribution of sources of seafood for Texas wholesalers/processors.

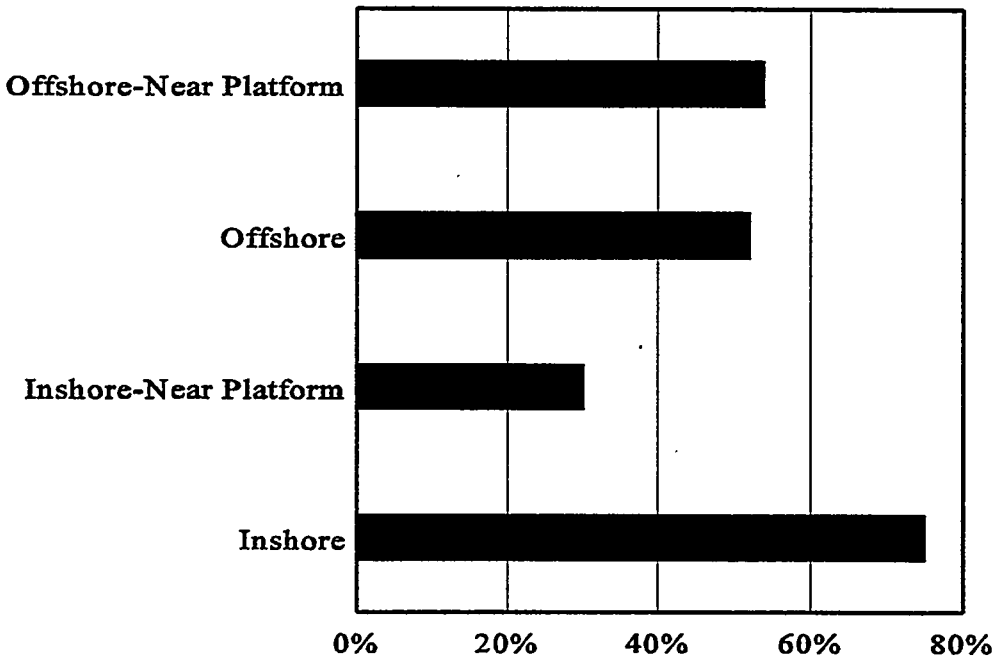

Figure 5.51. Average percentage of suppliers' fishing location for Texas wholesalers/processors.

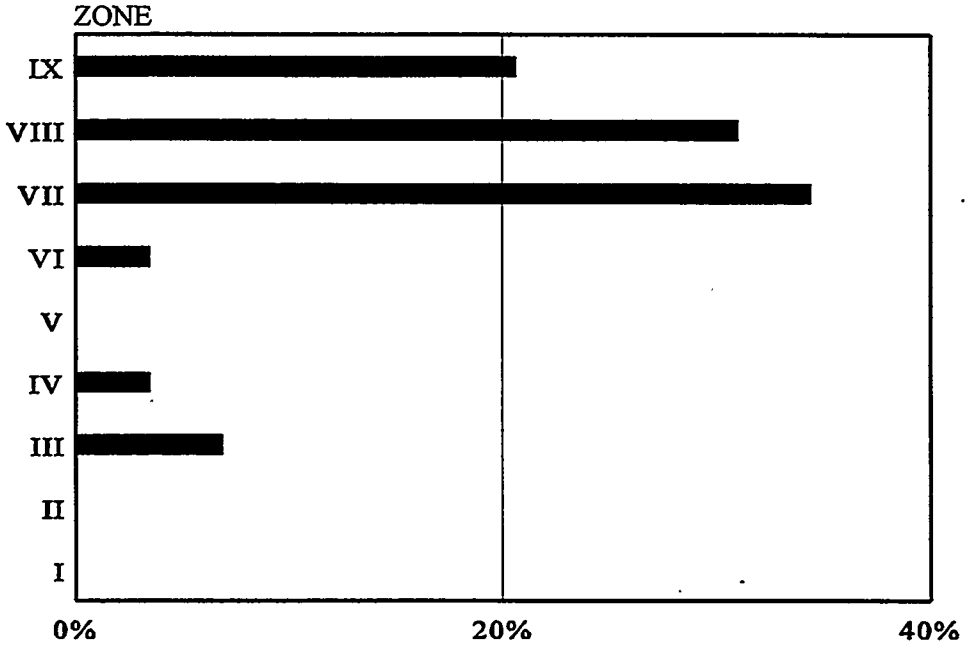

Figure 5.52. Frequency distribution of suppliers' fishing zones for Texas wholesalers/processors.

5.8.2 Quantity of Seafood Obtained

The average quantity of saltwater finfish received by the wholesalers/processors was 24,479 kg (53,967 lb) of whole fish and 14,742 kg (32,500 lb) of fish parts. Shrimp amounts averaged 105,746 kg (233,130 lb) for heads-on and 316,001 kg (696,663 lb) of heads-off. Oyster and blue crab responses were limited and were provided with inconsistent units of measure.

5.8.3 Distribution Patterns

The Texas wholesalers/processors sent less than 30% of their shellfish out-of-state. No hard shell blue crabs and blue crab meat were shipped out-of-state. About 21% percent of shrimp and 29% of oysters were transported out-of-state. Approximately 28% of shrimp were sold to wholesalers/dealers. Less than 18% of shellfish were transported to processing plants (**Figure 5.53**).

Nine percent of flounder and red snapper and 25% of tuna were sold to out-of-state sources. Thirty-eight percent of black drum, 27% of red snapper and 18% of flounder were sold to other in-state wholesalers/dealers. One hundred percent of speckled trout, 80% of sheepshead, 75% of tuna and 67% of vermilion snapper were sold to in-state retailers/restaurants. No species of finfish were sold to in-state processing plants (**Figure 5.54**).

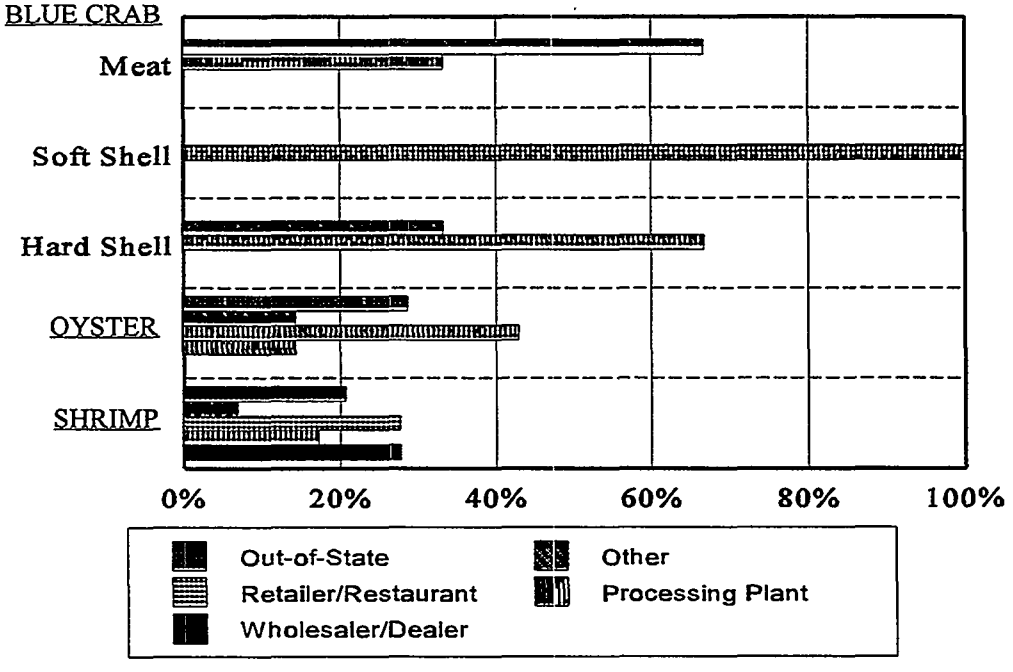

Figure 5.53. Frequency distribution of shellfish destinations from Texas wholesalers/processors.

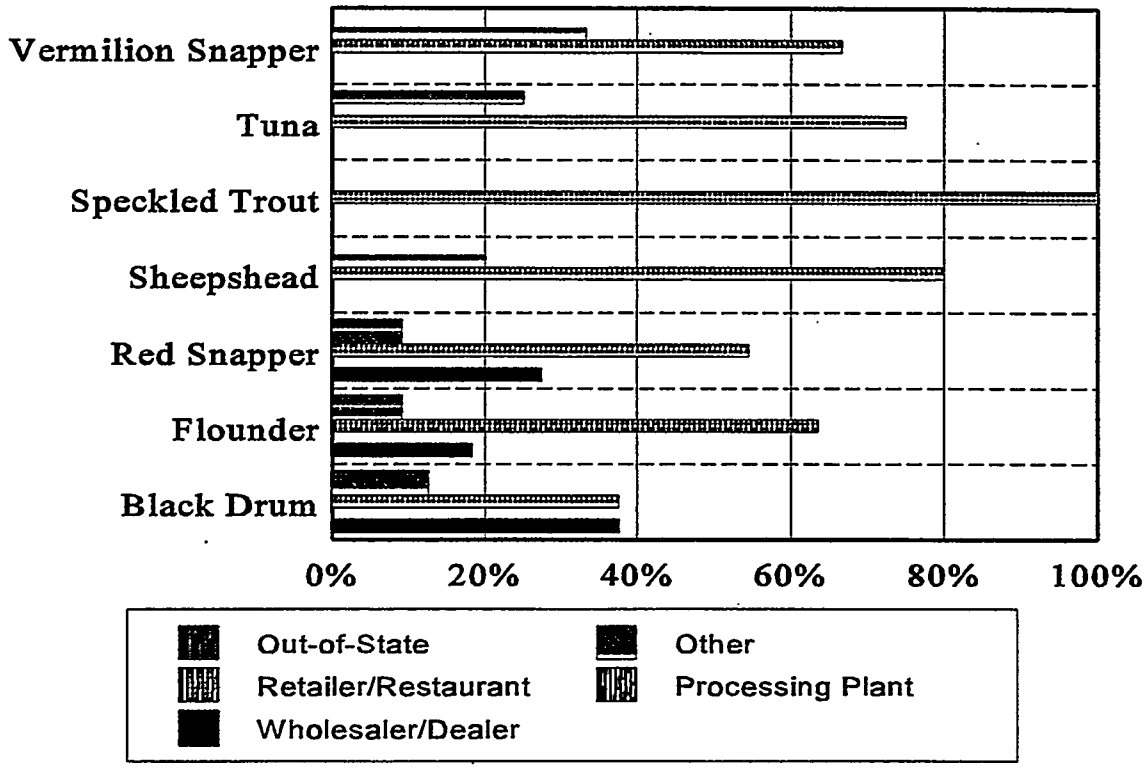

Figure 5.54. Frequency distribution of saltwater finfish destinations from Texas wholesalers/processors.

5.8.4 Product Form of Seafood Sold

The seafood was sold in a variety of forms. Oysters were most often sold in the shell (54%), shucked (39%) or prepared (8%). Blue crabs were sold whole (50%), as meat (33%) and prepared (17%). Shrimp were sold in the form of heads-on (33%), heads-off (38%), peeled and undeveined (10%), peeled and deveined (15%) and prepared (5%) (**Figure 5.55**). Over 60% of finfish species were typically sold whole. Sheepshead (80%), speckled trout (75%), flounder (75%) and vermilion snapper (74%) were commonly sold whole. Red snapper were marketed as whole fish (71%), filleted but with skin (14%) and filleted with no skin (14%). About 38% of black drum and 33% of tuna were sold filleted with no skin (**Figure 5.56**).

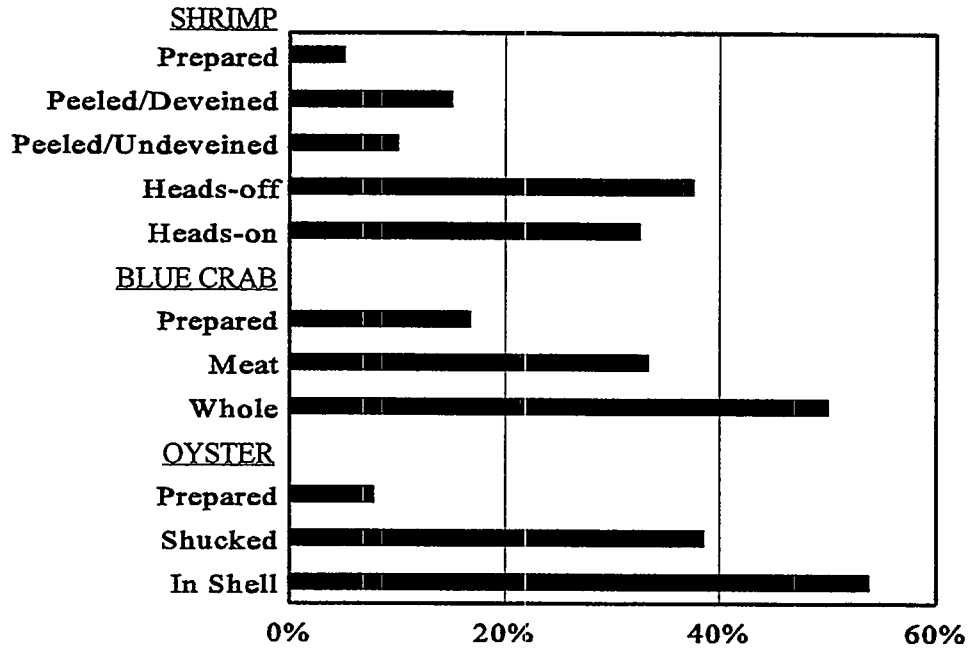

Figure 5.55. Frequency distribution of shellfish product sold by Texas wholesalers/processors.

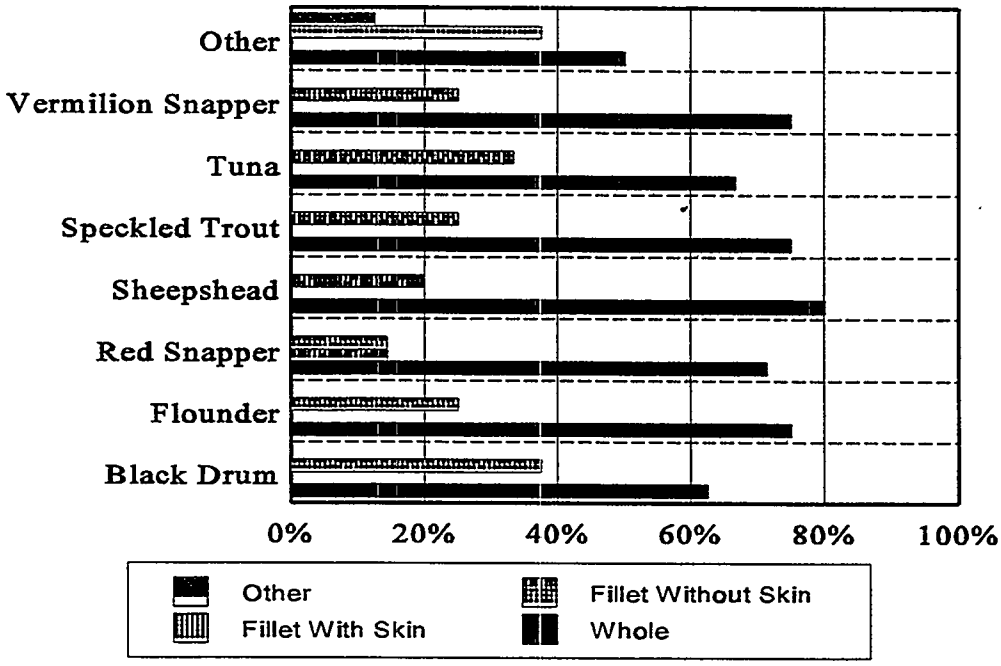

Figure 5.56. Frequency distribution of finfish product sold by Texas wholesalers/processors.

5.9 Louisiana Retail Seafood Market Survey

FISHIE personnel surveyed products at 226 retail outlets in or near population centers in coastal Louisiana parishes.

5.9.1 Species Sold and Cooking Methods

Data for the Louisiana Retail Seafood Market Survey was collected for both shellfish and finfish species. The types of shellfish were categorized into cooked and uncooked. Finfish were categorized into whole or filleted including skinned or unskinned versions, along with fish parts (i.e., heads, fins, roe, etc.) and cooked fish.

Shellfish were typically sold uncooked. Blue crabs, oysters and shrimp were sold in the uncooked state more than 50% of the time. Hard shell blue crabs had the lowest percentage of meats sold uncooked at 52%. Shelled oysters were sold uncooked (100%) as were soft shell blue crabs (94%) and headed shrimp (94%), as reflected in **Figure 5.57**.

Finfish were sold as whole fish (gutted) and fillets, and may or may not have head and skin removed. Croaker, king mackerel, sheepshead, flounder and black drum were sold as whole fish with the skin left on more than 60% of the time. A majority of grouper (50%) and shark (56%) were usually sold as fillets with no skin. None of the markets surveyed sold fish parts. Only flounder (1.2%), speckled trout (3%) and some miscellaneous species of fish (19%) were sold in a cooked state (**Figure 5.58**).

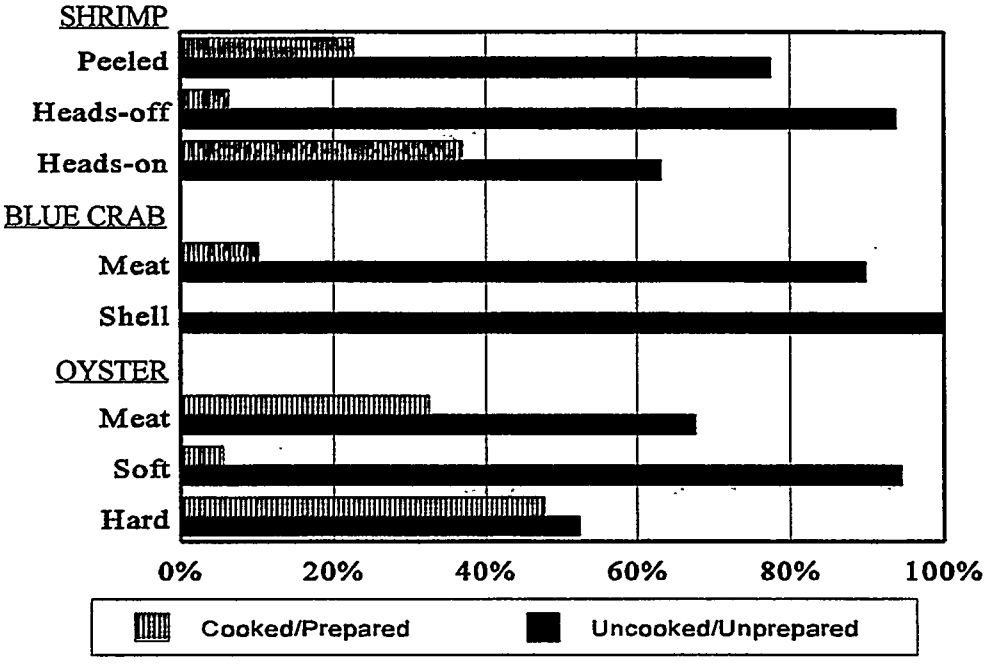

Figure 5.57. Frequency distribution of shellfish product sold by Louisiana retailers.

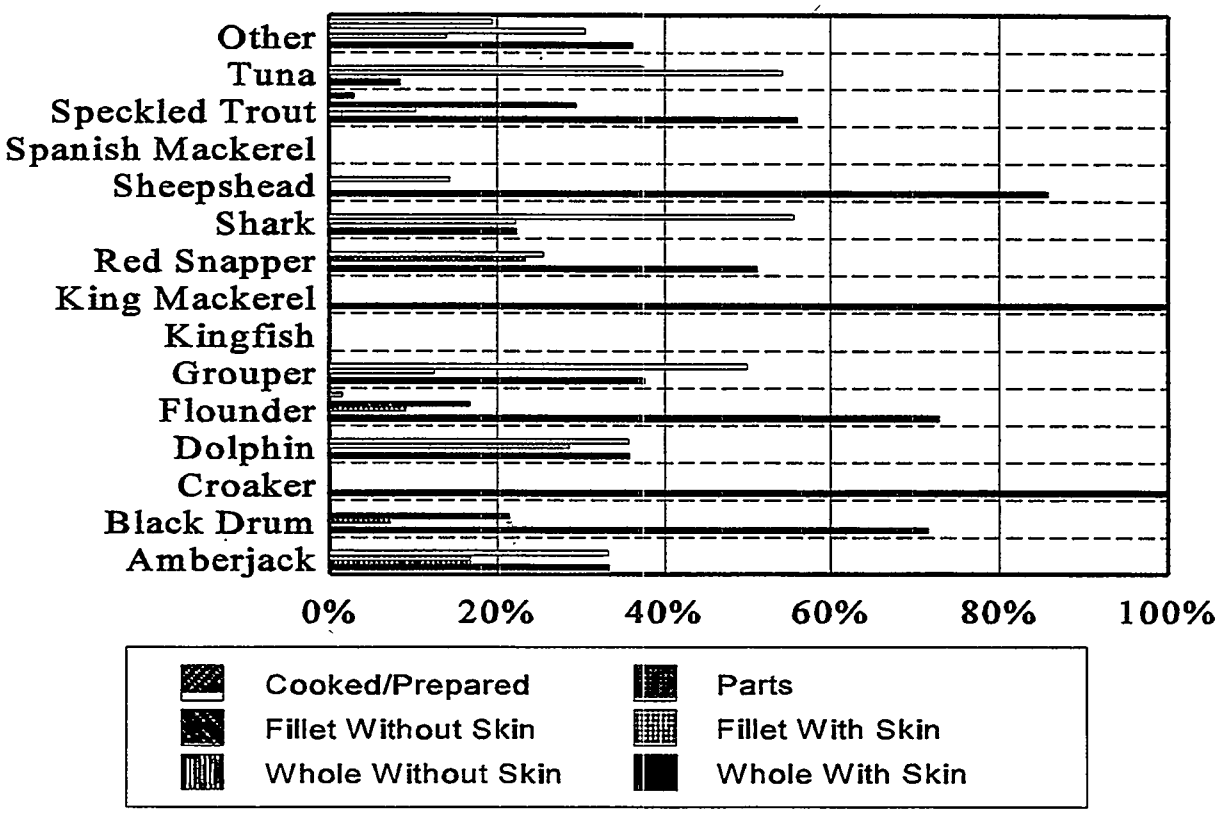

Figure 5.58. Frequency distribution of finfish product sold by Louisiana retailers.

5.9.2 Distribution Patterns

Shipping of seafood products to other parts of the state occurred in 33% of the markets. About 23% reported that they shipped seafood out-of-state.

5.10 Texas Retail Seafood Market Survey

FISHIE personnel surveyed products at 115 seafood retail outlets in population centers in coastal Texas counties.

5.10.1 Species Sold and Cooking Methods

Results of the Texas retail seafood market survey for shellfish are given in **Figure 5.59**. This figure shows the relative abundance of prepared and unprepared shellfish available in retail markets. Most shellfish were available unprepared with peeled shrimp having the largest frequency of occurrence (68%). About 36% of crab meat and 35% of oyster meats were available prepared.

Figure 5.60 details the form in which the finfish were available in retail markets. All of the croaker and kingfish available in the market were whole with skin. Over 50% of the total available black drum, flounder, grouper, red snapper, sheepshead, and Spanish mackerel were sold whole with skin. Only sheepshead were available whole with no skin and only 2% were offered in this form.

Of those fish available filleted, most were available without skin. Of the amberjack available, 75% were filleted without skin. One hundred percent of dolphin, 55% of shark, 29% of Spanish mackerel, 29% of tuna and 25% of grouper were available in this form. Less than 15% each of black drum, flounder, red snapper, sheepshead and speckled trout were available filleted with no skin.

Approximately 21% of tuna, 18% of shark, 16% of red snapper, 15% of speckled trout and 14% of Spanish mackerel were available as fillets with skin. Less than 5% each of black drum, flounder and sheepshead were available in this form.

Both tuna (15%) and grouper (13%) were available in parts (e.g., steaks). Most finfish were available unprepared although some of the speckled trout (24%), black drum (11%), flounder (5%), red snapper (4%) and sheepshead (4%) were available prepared.

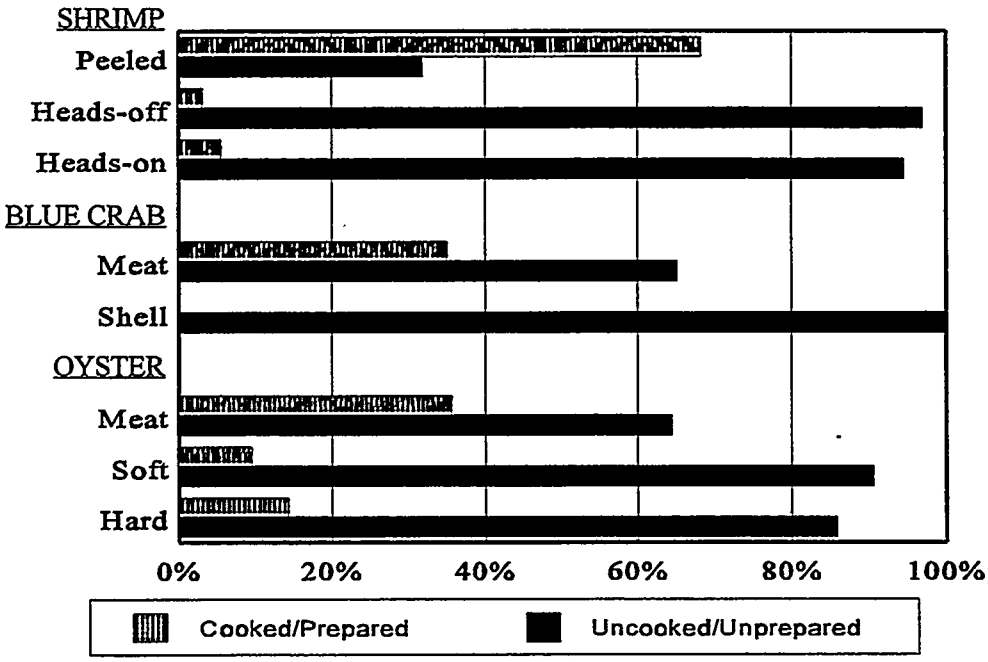

Figure 5.59. Frequency distribution of shellfish product sold by Texas retailers.

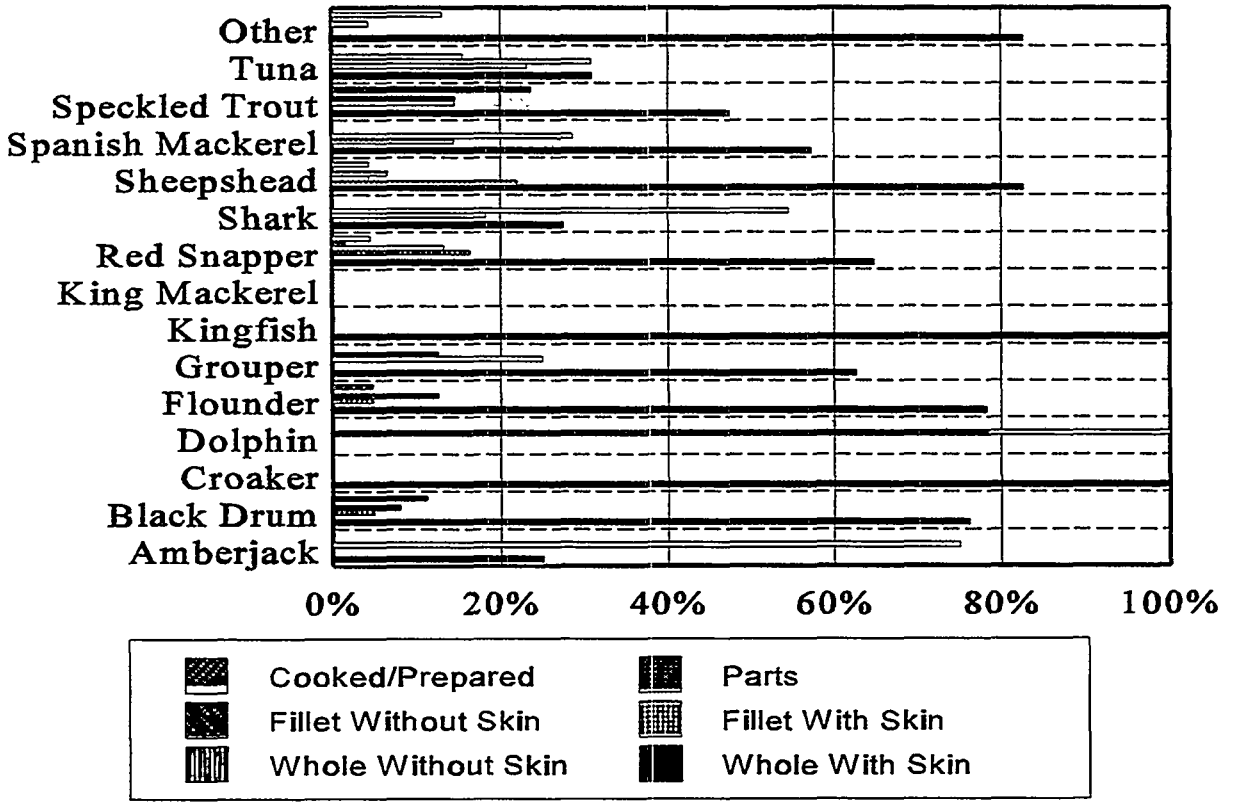

Figure 5.60. Frequency distribution of finfish product sold by Texas retailers.

5.10.2 Distribution Patterns

Shipping of seafood products to other parts of the state occurred in 18% of the markets. About 8% of the respondents reported that they shipped seafood out-of-state.

5.11 Louisiana Restaurant Survey

Fifteen hundred survey questionnaires were sent to members of the Louisiana Restaurant Association which served seafood. Seventy-nine (5.3%) were returned complete.

5.11.1 Seafood Served

The results from the Louisiana Restaurant Mail Survey showed that an average of 1,096 seafood dishes were served each week in 1992. Of the dishes served during this period, 48% consisted of shellfish, 46% involved finfish and 29% contained both shellfish and finfish (**Figure 5.61**).

Shrimp was the most popular shellfish dish comprising 52% of the average weekly shellfish dishes. Hard shell blue crab meat comprised 22% of shellfish dishes. Soft shell blue crabs (13%) and oysters on the half shell (15%) were the least common shellfish dishes served weekly (**Figure 5.62**).

The most common finfish species served were tuna (29%), speckled trout (25%) and red snapper (21%). Spanish mackerel and kingfish were not served by any of the responding restaurants (**Figure 5.63**).

Many restaurants used seafood stock in the preparation of their meals. Shellfish stock was used in an average of 335 meals per week in 1992, while finfish stock was used in an average of 272 meals per week during that same time period. Both shellfish and finfish stocks were combined in an average of 164 meals per week (**Figure 5.64**). Shrimp were the most common shellfish used to prepare stock (56%) followed by blue crab (28%) and oysters (16%) (**Figure 5.65**).

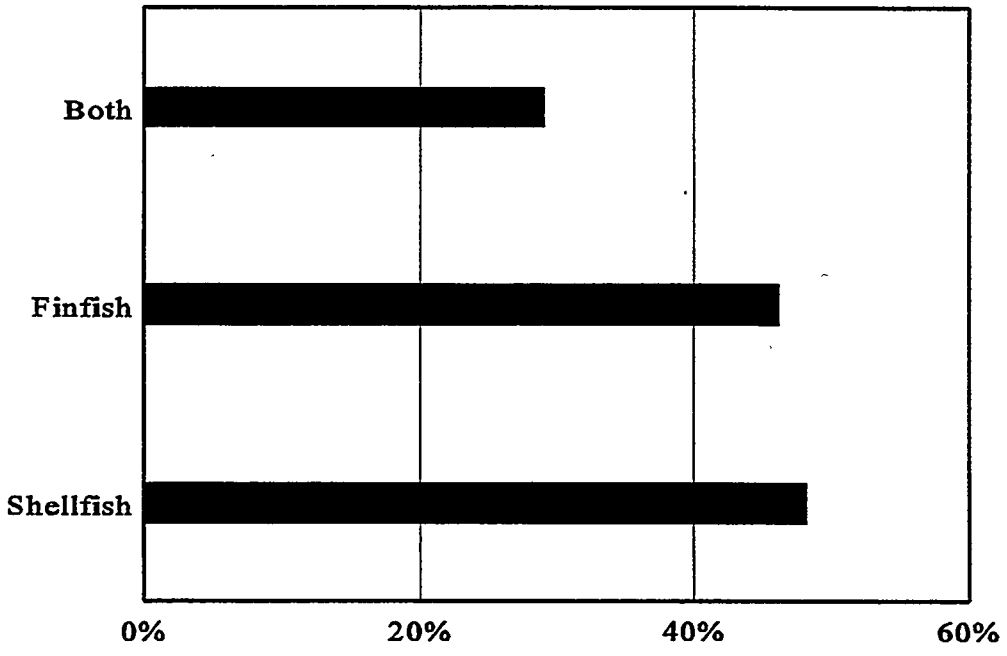

Figure 5.61. Average percentage of types of seafood dishes served in 1992 by Louisiana restaurants.

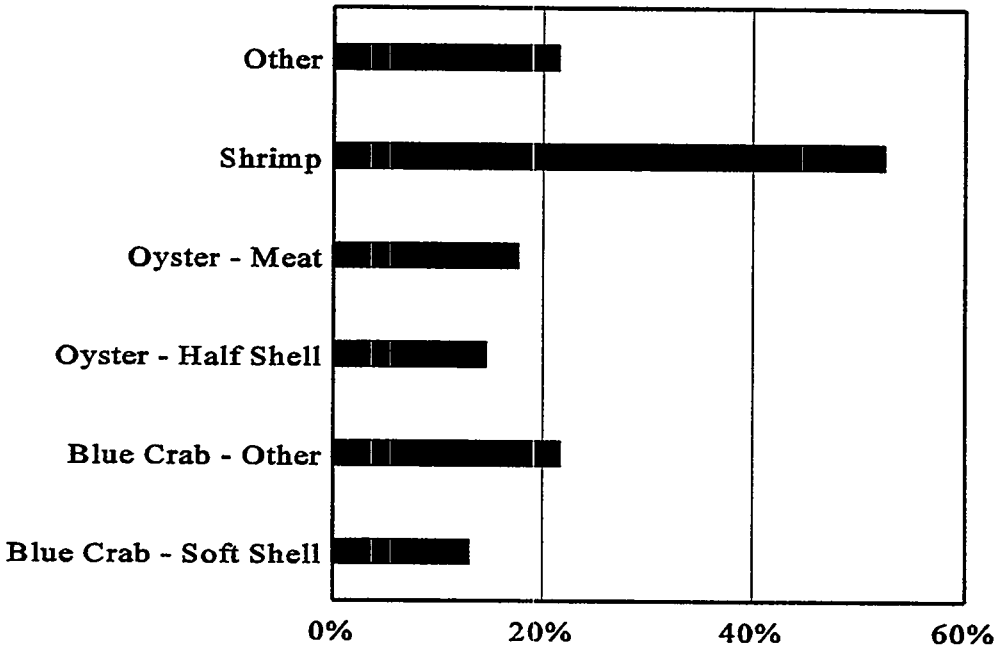

Figure 5.62. Average percentage of shellfish dishes served per week in 1992 by Louisiana restaurants.

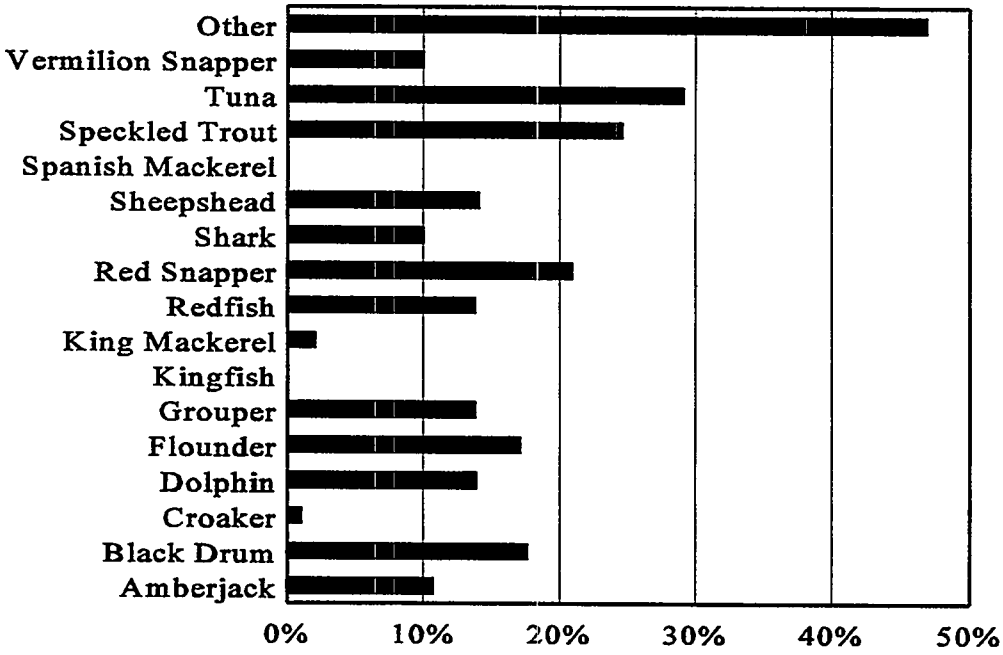

Figure 5.63. Average percentage of finfish dishes served per week in 1992 by Louisiana restaurants.

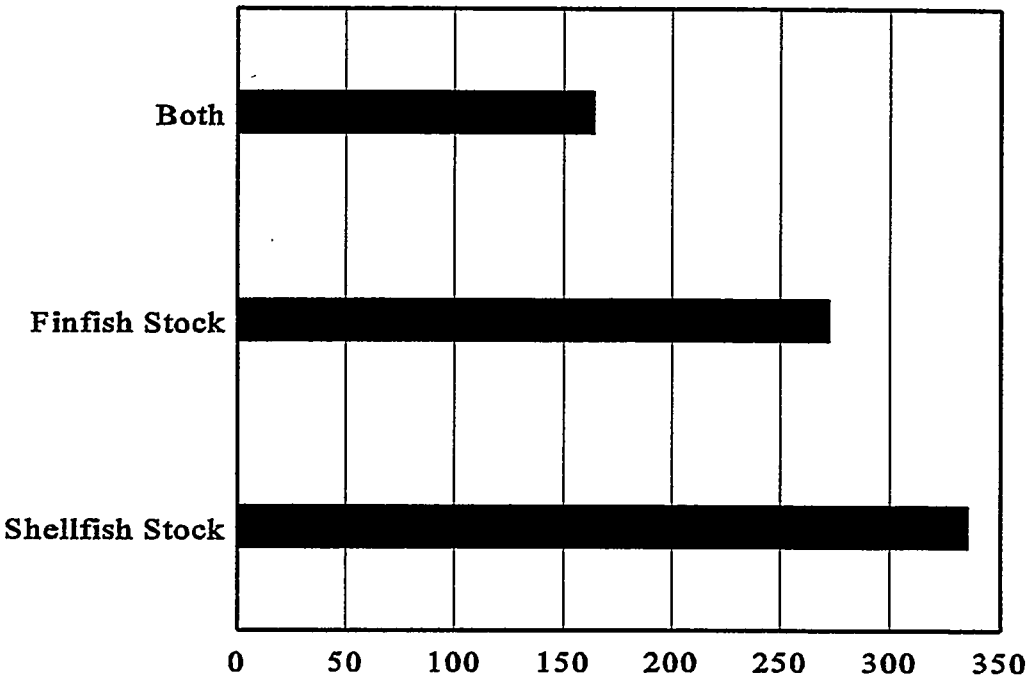

Figure 5.64. Average number of meals served in 1992 by Louisiana restaurants which included seafood stock.

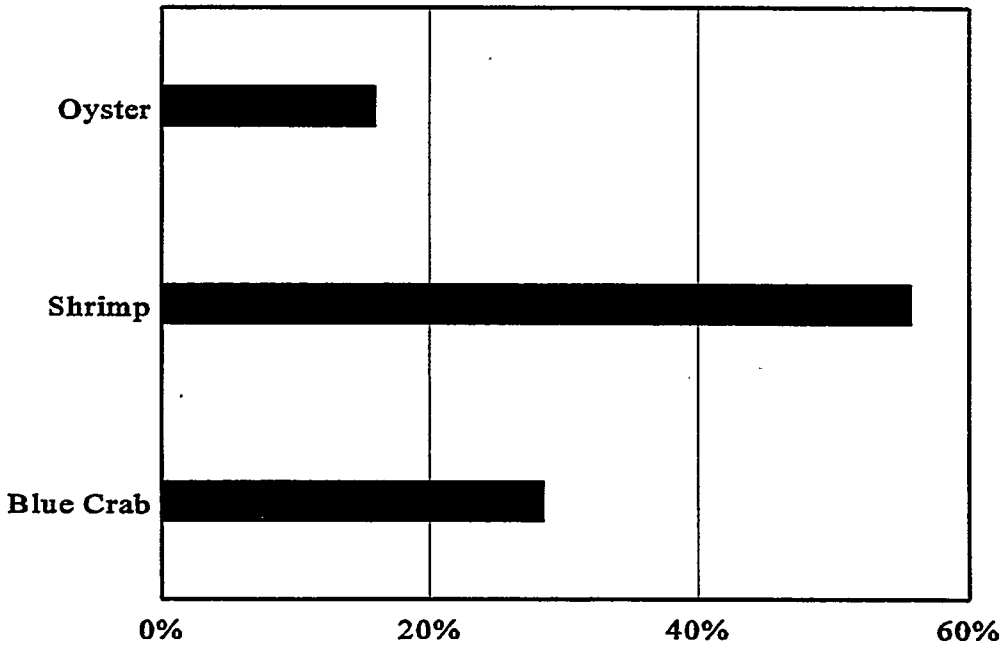

Figure 5.65. Frequency distribution of shellfish used in stock by Louisiana restaurants in 1992.

5.11.2 Sources of Seafood

About 31% of seafood was imported from out-of-state sources. Wholesalers/processors provided about 86% of the seafood served at restaurants. Commercial fishermen and retailers supplied about 36% of seafood products, while other sources contributed 12% (**Figure 5.66**).

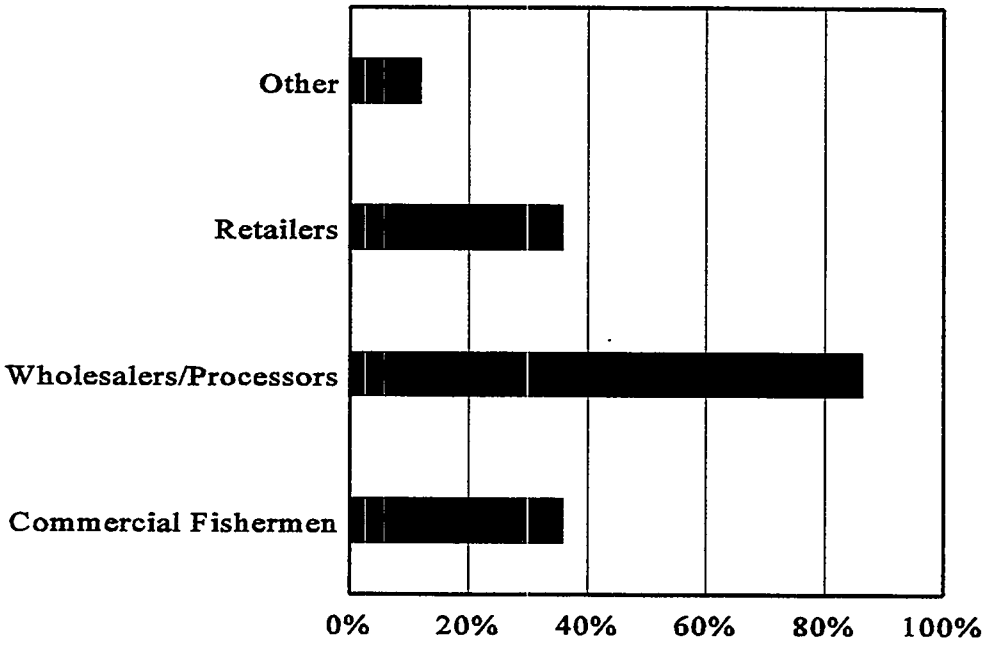

Figure 5.66. Average percentage of source of seafood for Louisiana restaurants in 1992.

5.11.3 Cooking Methods

Over 60% of finfish species were served as meat only. King mackerel was usually served with skin on (**Figure 5.67**). In the preparation of fish stock, king mackerel and sheepshead were used 40% and 25% of the time, respectively (**Figure 5.68**).

The most common seafood cooking methods were fried (18%), grilled (15%), broiled (15%) and baked (13%). Smoking and barbecuing, with each representing about 4%, were the least popular methods for cooking seafood (**Figure 5.69**).

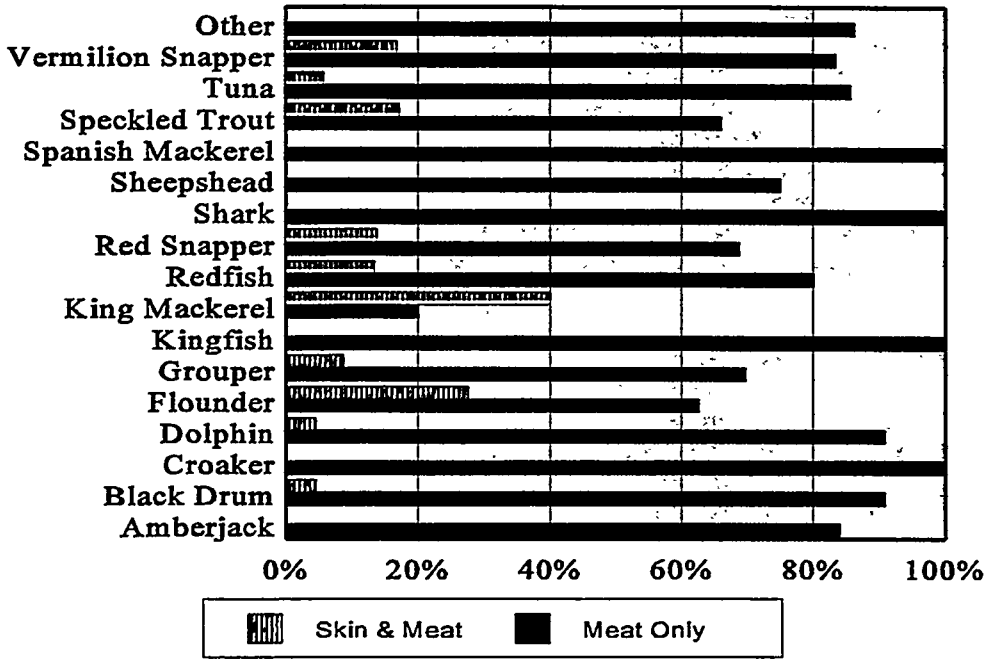

Figure 5.67. Percentage of finfish parts served in 1992 by Louisiana restaurants.

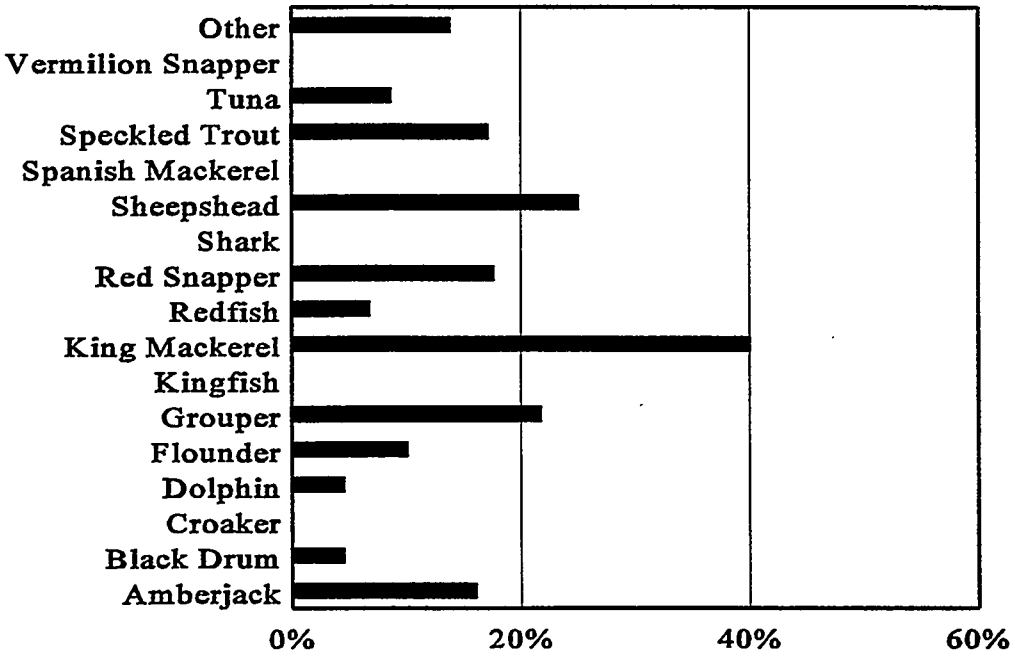

Figure 5.68. Percentage of finfish species used in stock by Louisiana restaurants in 1992.

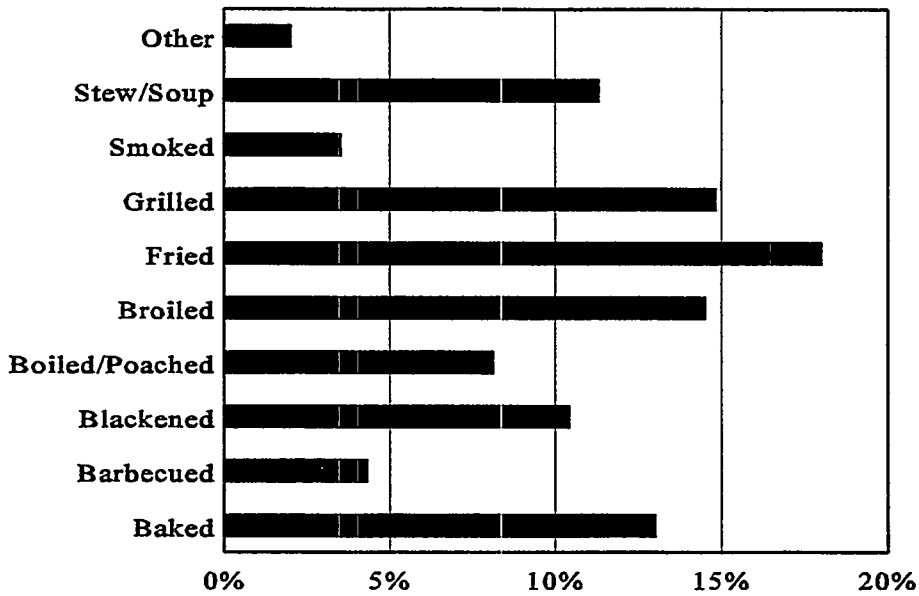

Figure 5.69. Frequency distribution of cooking mthods of seafood served in Louisiana restaurants in 1992.

5.12 Texas Restaurant Survey

Fifteen hundred survey questionnaires were sent to members of the Texas Restaurant Association who serve seafood. Seventy-five surveys (5.0%) were returned complete.

5.12.1 Seafood Served

The results from the Texas Restaurant Mail Survey showed that an average number of 678 seafood dishes were served per week in 1992. Of the dishes served during this period, 55% consisted of shellfish, 45% involved finfish and 36% contained both shellfish and finfish (**Figure 5.70**).

Shrimp was the most popular shellfish dish comprising 74% of the average weekly shellfish dishes. Oyster meats and oysters on the half shell comprised 22% and 19%, respectively, of shellfish dishes. Hard shell blue crab meats (14%) and soft shell blue crabs (6%) were the least common shellfish dishes served weekly (**Figure 5.71**).

The most common finfish species served were red snapper (31%), speckled trout (26%) and flounder (23%). Vermilion snapper was not served by any of the responding restaurants (**Figure 5.72**).

Many restaurants used seafood stock in the preparation of their meals. Shellfish stock was used in an average of 132 meals per week in 1992, while finfish stock was used in an average of 230 meals per week during that same time period. Both shellfish and finfish stocks were combined in an average of 197 meals per week (**Figure 5.73**). Shrimp were the most common shellfish used to prepare stock (69%) followed by blue crab (19%) and oysters (12%) (**Figure 5.74**).

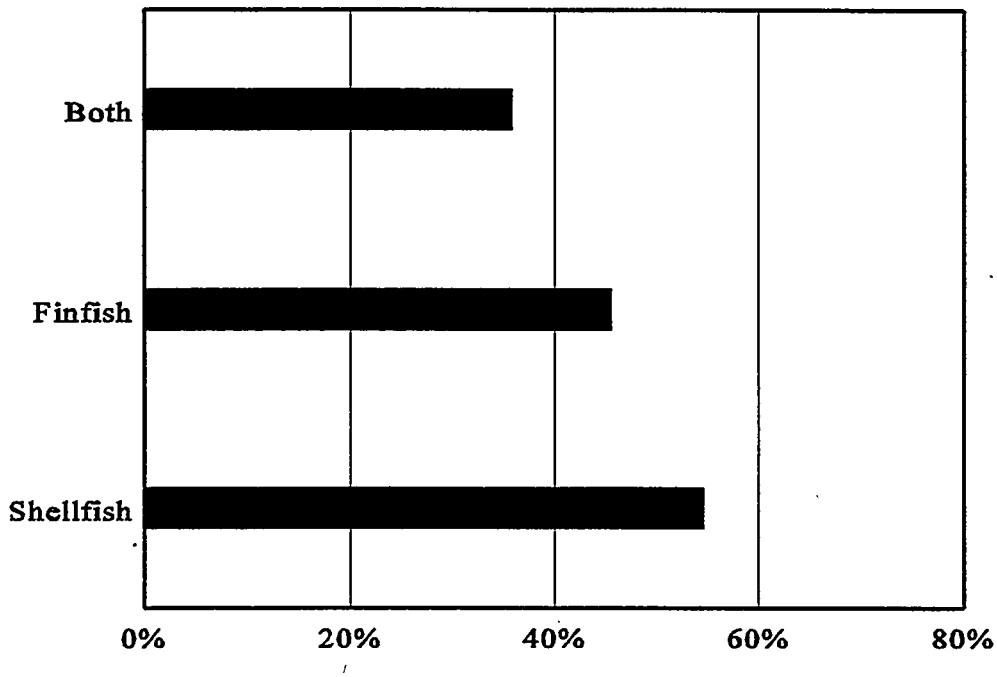

Figure 5.70. Average percentage of types of seafood dishes served in 1992 by Texas restaurants.

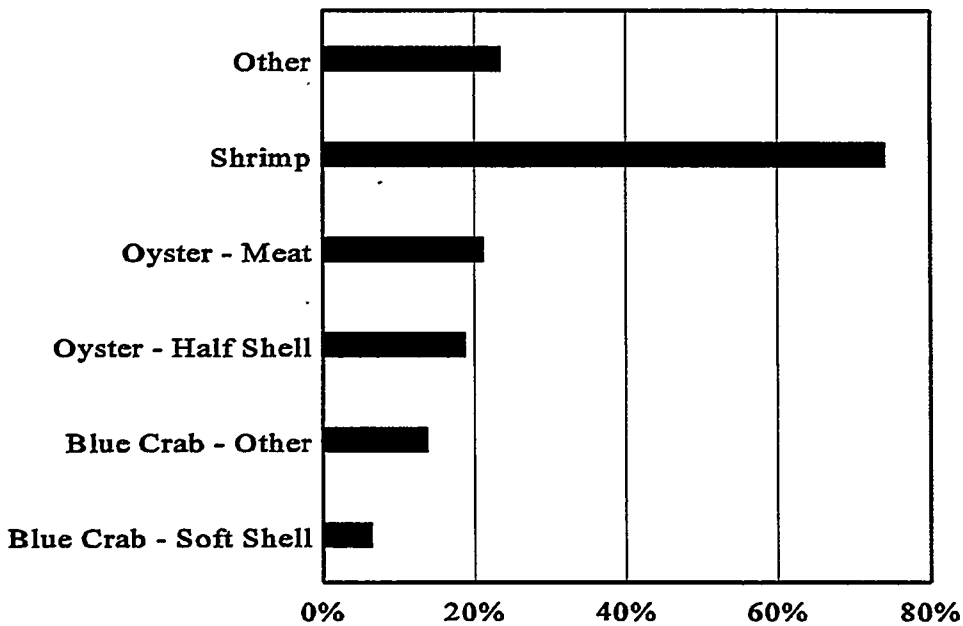

Figure 5.71. Average percentage of shellfish dishes served per week in 1992 by Texas restaurants.

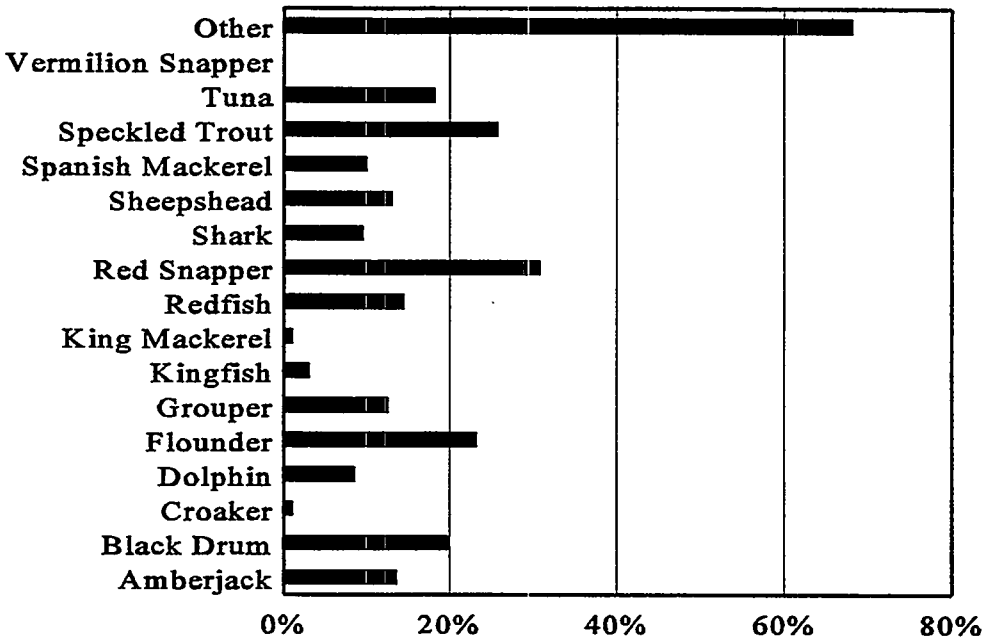

Figure 5.72. Average percentage of finfish dishes served per week in 1992 by Texas restaurants.

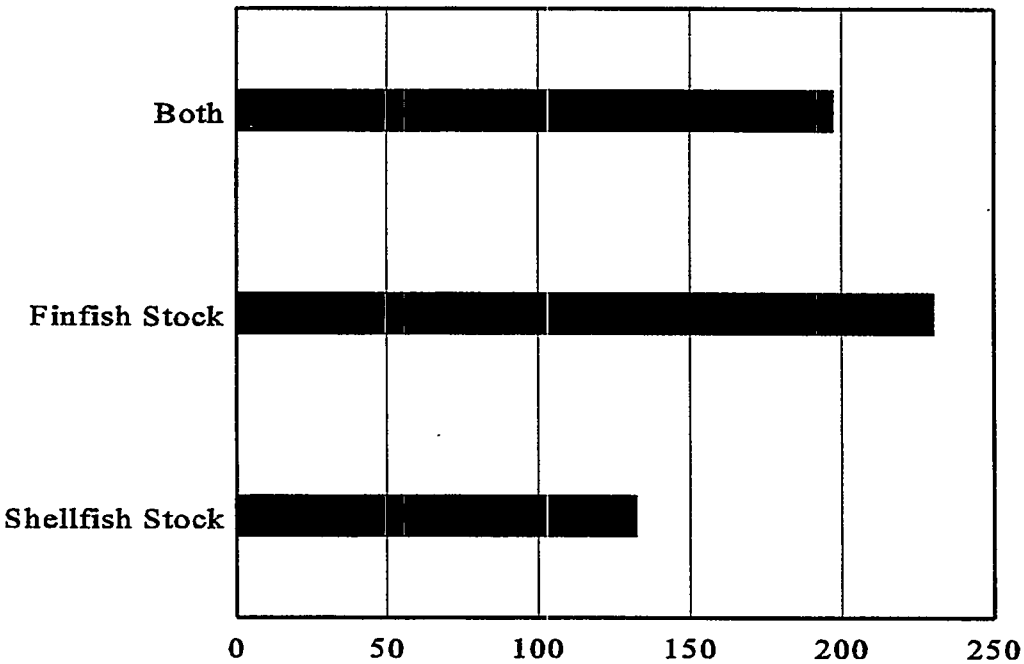

Figure 5.73. Average number of meals served in 1992 by Texas restaurants which included seafood stock.

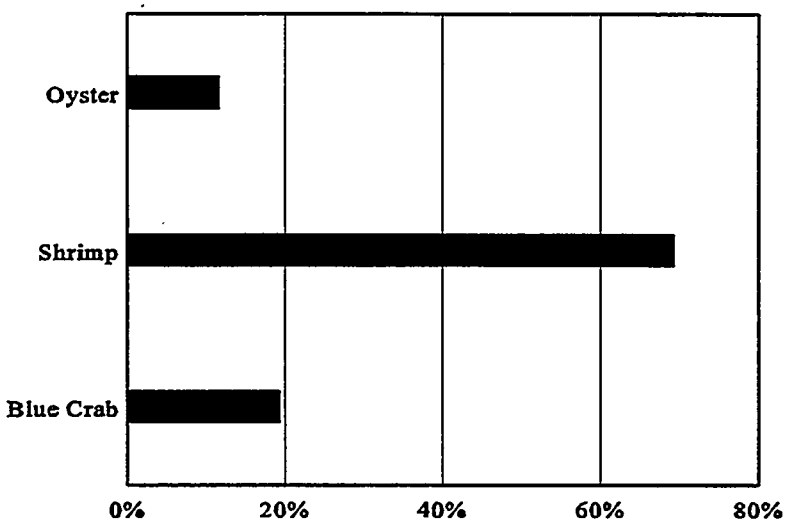

Figure 5.74. Frequency distribution of shellfish used in stock by Texas restaurants in 1992.

5.12.2 Sources of Seafood

Texas restaurant survey respondents indicated that they import nearly twice as much seafood as the Louisiana restaurant survey respondents, 62% versus 31%, respectively. Wholesalers/processors provided about 91% of the seafood served at restaurants. Other seafood sources were retailers (50%), commercial fishermen (40%) and other sources (15%) (**Figure 5.75**).

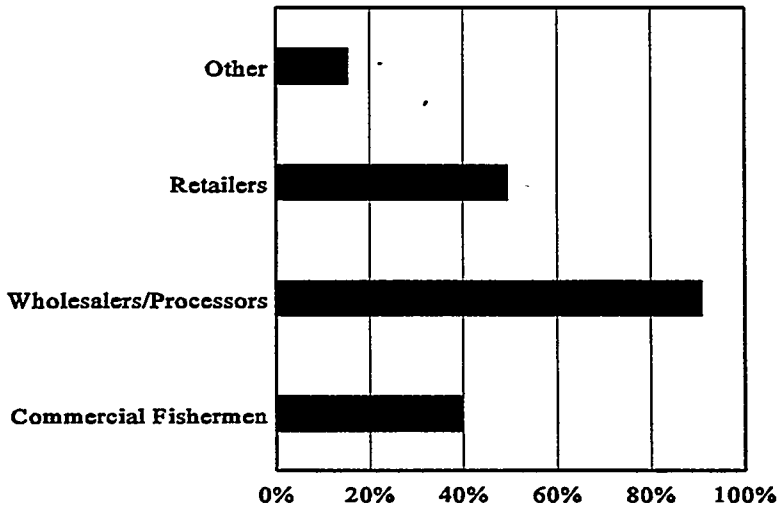

Figure 5.75. Average percentage of source of seafood for Texas restaurants in 1992.

5.12.3 Cooking Methods

Over 58% of finfish species consumed were served as meat only. Flounder (31%), redfish (27%), speckled trout (26%) and red snapper (24%) were usually served with skin on (**Figure 5.76**). In the preparation of fish stock red snapper, amberjack and dolphin were each used about 15% of the time (**Figure 5.77**).

The most common seafood cooking methods were fried (22%), grilled (14%), broiled (12%), stew/soup (11%), boiled/poached (11%) and baked (11%) (**Figure 5.78**).

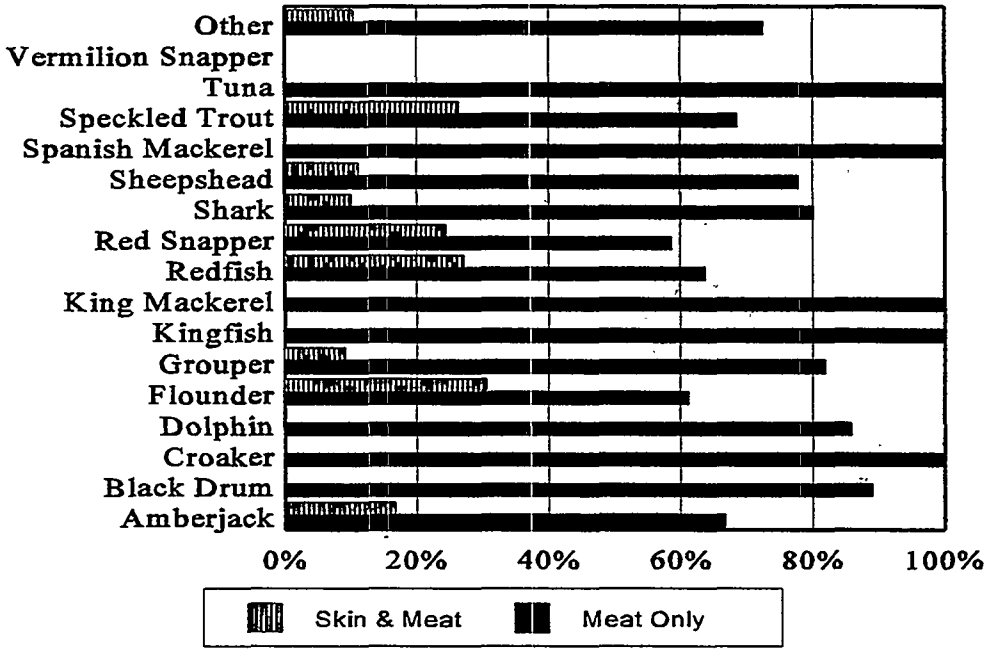

Figure 5.76. Percentage of finfish parts served in 1992 by Texas restaurants.

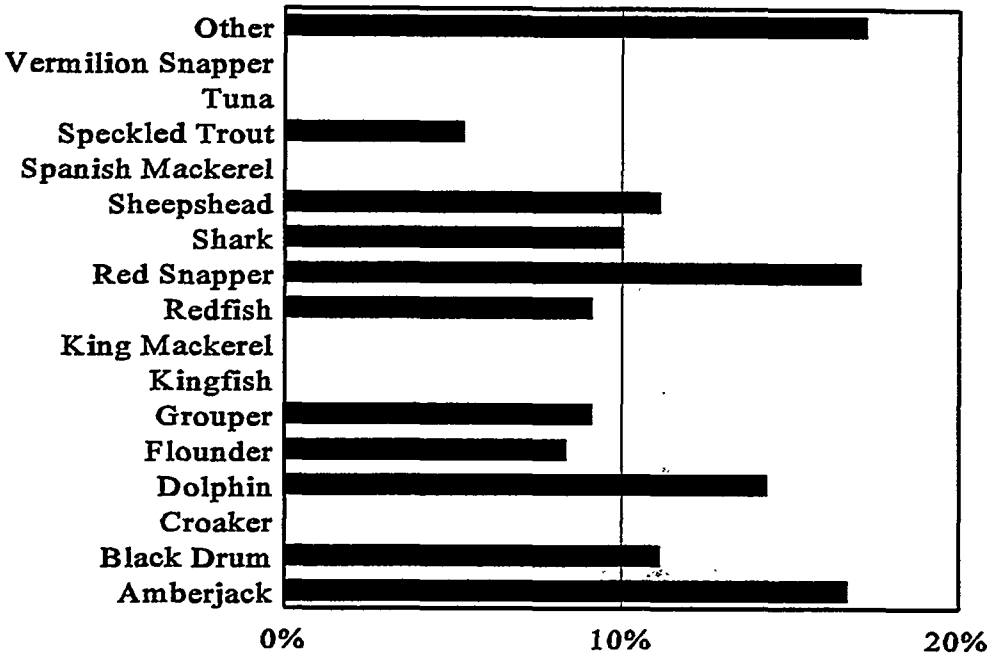

Figure 5.77. Percentage of finfish species used in stock by Texas restaurants in 1992.

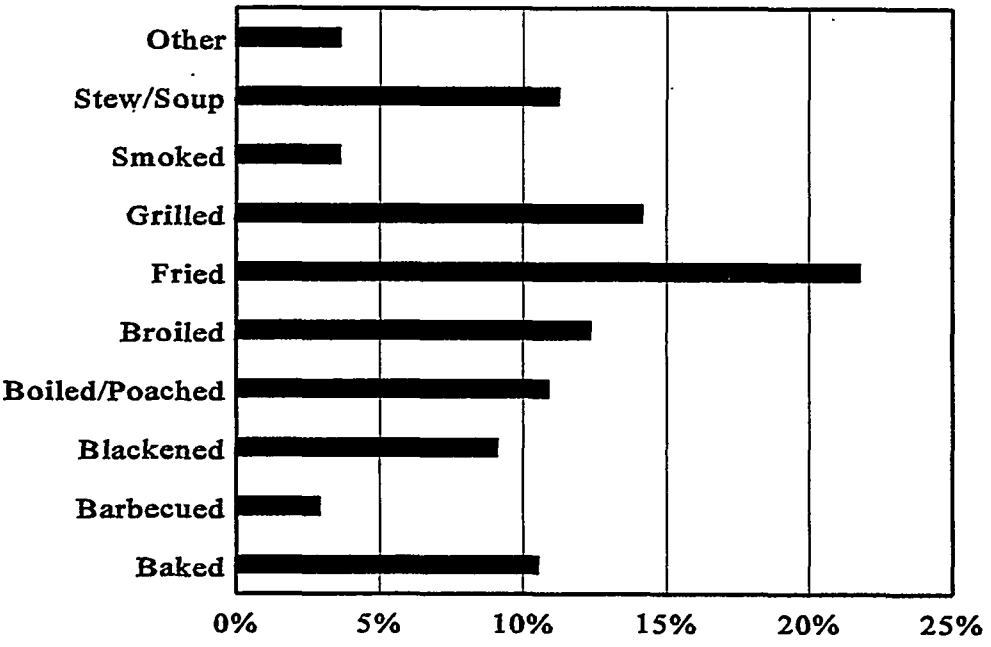

Figure 5.78. Frequency distribution of cooking methods of seafood served in Texas restaurants in 1992.

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6.0 DISCUSSION

Data were presented previously which summarized survey results pertaining to various Louisiana and Texas fisheries (i.e., recreational, commercial, oyster) and the distribution and consumption patterns for fish and invertebrate species caught (i.e., fish wholesalers and processors, retail seafood markets, restaurants). The following section discusses the trends and findings evident in the survey data.

6.1 Intrasurvey Comparisons

6.1.1 Recreational Fishermen

Recreational fishermen from Louisiana and Texas were interviewed at several sites including sporting club meetings, boat docks, fishing tournament weigh-in locations as well as over the telephone. Most respondents reported they finfish rather than shrimp, crab or harvest oysters. All of the fishermen surveyed fished from a boat in inshore waters rather than onshore fishermen who would not be able to fish in proximity to oilfield structures.

Recreational fishermen reported they preferred to keep their catch instead of giving it away. The respondents indicated that they infrequently served their catch in their household, but when they did, it was usually filleted, skinned and fried.

Louisiana recreational fishermen reported fishing in close proximity to oilfield structures more often than the Texas respondents. This may be due to the large number of well canals and oilfield structures in the marshes and bayous of south Louisiana where many of the fishing trips occurred.

6.1.2 Commercial Fishermen

Commercial fishermen depend primarily on their catch for their livelihood. Commercial shrimpers comprised 77% of the commercial fishermen interviewed. Shrimpers were more accessible for survey since their hours of operating were more predictable than the other types of commercial fishermen. Shrimp unloading locations were more numerous and easier to access.

Commercial fishermen, although more likely to fish inshore waters, were more likely to fish near oilfield structures which they believed attracted organisms. The fishermen reported that they consume seafood on a regular basis in their household, but sell the vast majority of their catch to wholesalers/processors or restaurants/retailers.

6.1.3 Oyster Fishermen

A number of similarities were observed between the Louisiana and Texas oyster fishermen. The average make up of the household by gender for both states was similar. The results also show that oystermen prefer to eat their oysters raw, although their household inhabitants preferred their oysters fried. Oysters are a favorite food of oystermen from both states being served two to three times per week.

Some differences between the oystermen from the two states are noteworthy. In Louisiana, 91% of the respondents were white reflecting the heritage of the oyster fishermen who settled in Louisiana. Texas respondents were primarily Hispanic. Due to Louisiana's myriad bayous and well canals, features not common in Texas, the Louisiana oyster fishermen are usually in closer proximity, less than 0.8 km (0.5 mi), to oilfield structures than their Texas counterparts.

6.1.4 Wholesalers and Processors

Good response was obtained from the wholesalers/processors for both Louisiana and Texas. Their primary source of seafood was from in-state commercial fishermen with very little seafood coming in from other countries. They indicated that their offshore suppliers fish in proximity to oilfield structures a large percentage of their time. Finfish species associated with oilfield structures and wellheads would be more frequently caught under these conditions.

Louisiana wholesalers/processors handle significantly more finfish and shellfish than their Texas counterparts. Louisiana respondents handled an average of 12 times more finfish and almost six times more shrimp. This is in agreement with the landings data which show Louisiana landings nearly twice as great as Texas landings.

6.1.5 Retail Seafood Markets

Retail seafood outlets in Louisiana and Texas primarily offer and serve their seafood in similar forms. Outlets typically have uncooked portions of shellfish and finfish. Among prepared seafood, Louisiana retailers were more likely to offer prepared hard shell blue crabs, while Texas retailers commonly prepared their peeled and headed shrimp. The finfish species were well represented by both states' retailers, although Texas outlets offered more finfish species in parts, typically "steaks" or cross-sectional pieces of fish meat. Louisiana retailers are more likely to ship fresh and prepared seafood to other parts of the state and out-of-state than the Texas retailers.

6.1.6 Restaurants

Respondents to the restaurant survey for both Louisiana and Texas reported similar trends and tendencies in seafood preparation and service. For each state shellfish dishes were more popular than finfish or a combination of the two. Shrimp was the most common ingredient in those dishes. Speckled trout and red snapper were the finfish species most often served.

Restaurants in Louisiana and Texas depend on wholesalers/processors to provide them with their seafood. More than 60% of the Texas restaurant respondents depend on out-of-state sources for their seafood. This is a very large number in view of the fact that Louisiana was <u>not</u> considered an out-of-state source for purposes of this survey. Since Louisiana has the largest fisheries landings for the continental U.S. and is adjacent to Texas, it is not surprising that Texas would import some of Louisiana's seafood.

6.1.7 Statistical Findings

Data quality analyses were conducted to determine whether survey responses concerning finfish species were consistent both within and among surveys. The analyses focused only on finfish information from the ten surveys. This was a necessary choice because finfish species information was the only

information common to all ten surveys. The results of analysis of variance presented in Section 4 indicate consistency of reporting both within and among surveys.

6.2 Intersurvey Comparisons

6.2.1 Location of Seafood Catch

The data indicate that the recreational and commercial fishermen (excluding commercial oystermen) for both Louisiana and Texas choose to fish near an oilfield structure on approximately 30% of their fishing trips. Louisiana and Texas commercial fishermen and Louisiana recreational fishermen more commonly fish near oilfield structures than Texas recreational fishermen. This may be attributable to location and accessibility of the Louisiana oilfield structures and to the life cycle and migratory habits of the finfish.

Louisiana oyster fishermen commonly developed their beds in proximity to the oilfield structures in contrast to their Texas counterparts. This may be attributable to the numerous well canals and oilfield structures along the major bayous and waterways of south Louisiana. In Texas, Galveston Bay is the most prolific oyster-producing location.

The Texas and Louisiana wholesalers/processors report that significant amounts of their seafood comes from waters near oilfield structures, particularly from suppliers who fish offshore. Louisiana wholesalers/processors report their suppliers fishing near oilfield structures because of a large number of oilfield structures along the Louisiana coast.

6.2.2 Sources of Seafood

Information obtained from the Louisiana and Texas wholesalers/processors indicates that a large amount of the seafood was supplied by in-state commercial fishermen and other in-state wholesalers/processors. For the purpose of this study, Louisiana and Texas were not considered out-of-state in either states' survey. Therefore, large amounts of seafood from the neighboring state could be received by a wholesaler/processor and significantly affect the reported source of seafood. The data show only a small percentage of the seafood comes from out-of-state and out-of-country sources.

Products from wholesalers/processors represent a major source of seafood to restaurants. The data indicates that restaurants attempt to provide fresh seafood to their customers and the acquisition of seafood from local or in-state sources helps ensure that fresh seafood will be served.

6.2.3 Distribution Patterns

As one would expect, the recreational fishermen from Louisiana and Texas reported that they typically kept their seafood catch. Surprisingly the respondents stated that they were more likely to give away popular eating finfish species such as grouper, snapper and tuna. Commercial fishermen most likely sell their seafood catch to wholesalers/processors. Many wholesalers/processors are located on the major waterways of Louisiana and Texas making them readily accessible to the commercial fishermen. Wholesalers/processors were more likely to purchase the entire catch of the commercial fishermen, eliminating the commercial fishermen's need to transport and sell his catch to various outlets.

Wholesalers/processors usually sell their products to restaurants and retailers. Since they do not necessarily change the form of the seafood prior to sale, they serve as an intermediate step in transferring seafood from fishermen to consumer. The large volume of seafood handled by the wholesaler/processor suggests that they are able to supply seafood to various parts of the region. The respondents indicated that a small percentage of the seafood was transported out-of-state.

6.2.4 Consumption Patterns

The data from the wholesalers/processors and retailers indicate that these groups prefer to sell their finfish products whole (gutted but not skinned). Few of the respondents reported filleting their finfish. This probably allows them to move large volumes of product with very little preparation and therefore very little cost.

Recreational and commercial fishermen on the other hand prefer their finfish filleted and skinned. The restaurants also report that they usually serve filleted and skinned finfish to their customers. This is probably done to make the fish more appetizing and appealing.

The preferred method of cooking seafood was fried. This was the method of choice reported by all types of fishermen and the restaurants. Fried seafood has long been a favorite method of preparation in the South. Except for oyster fishermen who still enjoy eating their oysters raw, broiled and grilled seafood were the next most popular methods of preparing seafood.

6.3 Proximity to Oilfield Structures

Some finfish species are more frequently observed in close proximity to oilfield structures than are other species. One might reasonably expect, therefore, that Louisiana and Texas recreational fishermen would report catching some species in close proximity to oilfield structures more frequently than other species. This expectation was indeed realized in an analysis of the Louisiana and Texas recreational fishermen data sets which are shown in **Figures 6.1** and **6.2**, respectively.

Two distances relative to oilfield structures were particularly significant: 1) closer than 300 m (1,000 ft); and 2) farther away than 0.8 km (0.5 mi). Finfish species whose reported catch frequencies were at least 50% greater in close proximity to oilfield structures included amberjack, grouper, king mackerel, red snapper, shark and vermilion snapper. Finfish species whose reported catch frequencies were at least 50% greater at distances of one mi or more from oilfield structures included flounder, redfish and speckled trout.

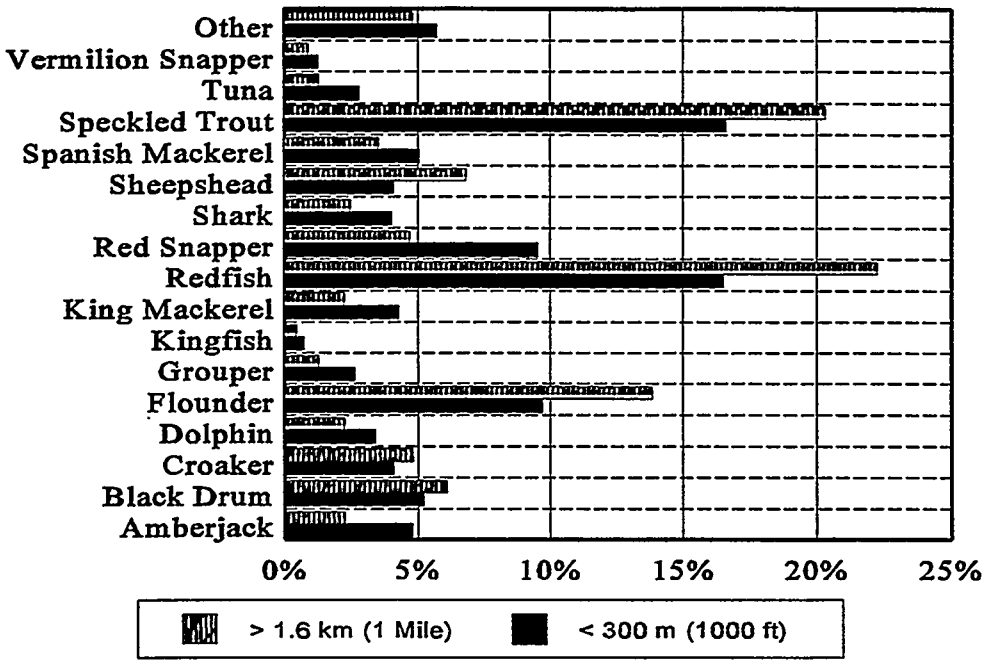

Figure 6.1. Frequency distribution of finfish species caught in proximity to oilfield structures in summer and fall of 1992 in Louisiana.

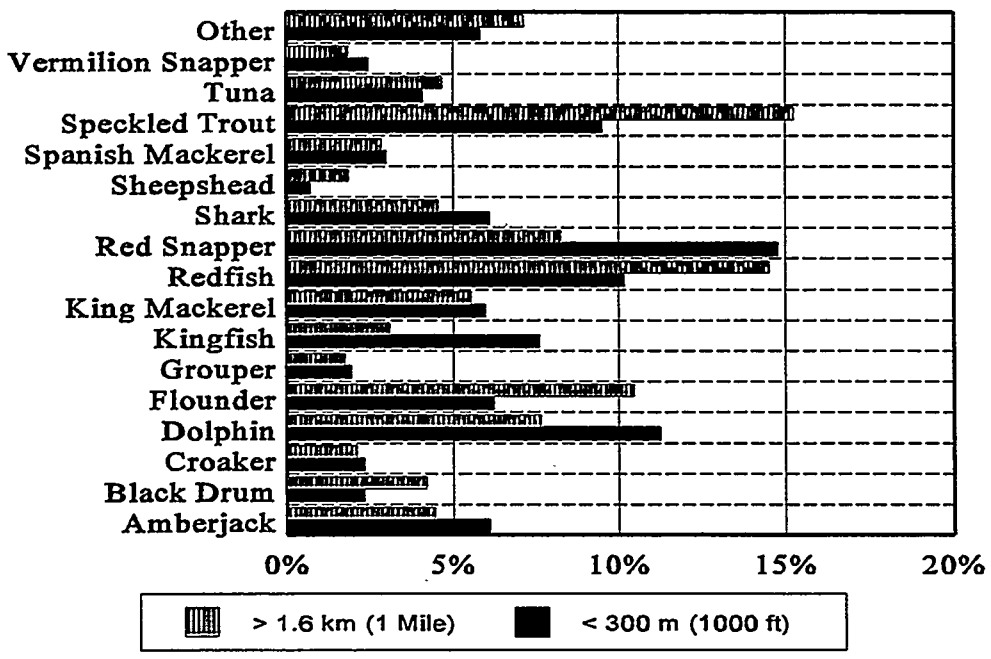

Figure 6.2. Frequency distribution of finfish species caught in proximity to oilfield structures in the summer and fall of 1992 in Texas.

6.4 Seasonality of Finfish Catch

Louisiana and Texas Recreational Fishermen were surveyed during the summer (June-August) and fall (September-November) seasons. Analysis of the Louisiana and Texas data sets revealed a marked difference in frequencies of finfish species caught during the two seasons as in **Figures 6.3** and **6.4**, respectively. Finfish species more frequently caught in the summer season included amberjack, dolphin, grouper, king mackerel, red snapper and vermilion snapper. Finfish species more frequently caught in the fall season included black drum, croaker, flounder, redfish and speckled trout.

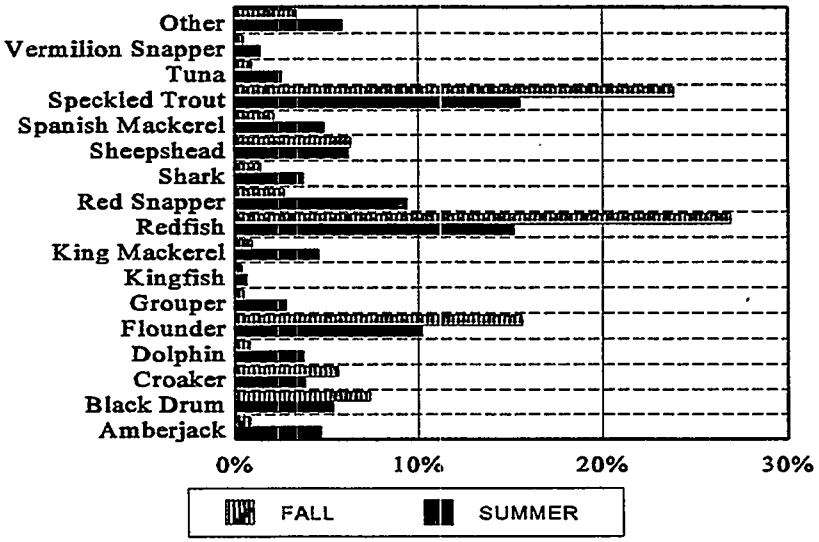

Figure 6.3. Frequency distribution of finfish species caught in summer and fall of 1992 in Louisiana.

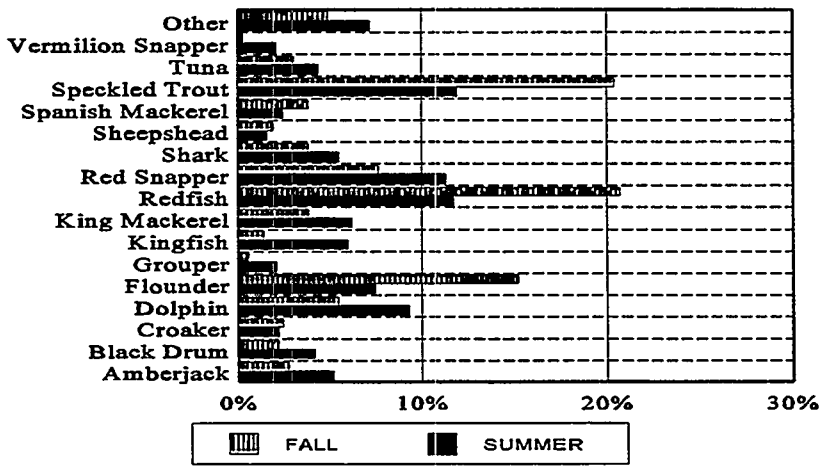

Figure 6.4. Frequency distribution of finfish species caught in summer and fall of 1992 in Texas.

7.0 CONCLUSIONS

Over the two state area surveyed, a large percentage of seafood was harvested commercially and recreationally near inshore and offshore oilfield structures. This was particularly true in the large expanses of Louisiana estuaries from which was harvested much of Louisiana's landings, the second largest landings in the U.S. Seafood harvested by commercial fishermen - primarily shrimp fishermen - was most often sold to wholesaler/processors. These middlemen ship the seafood with little value added to retail outlets and restaurants.

Retail outlets provide mostly uncooked fresh seafood to the public. Restaurants which serve seafood do so as a large percentage of their total meals served. Fresh seafood served to consumers was fried. Stock was often used in the preparation of seafood dishes.

Seafood harvested by recreational fishermen was usually kept for home consumption and prepared fried. Most of the seafood harvested locally, both commercially and recreationally, remains in the local population. Very little of the fresh seafood sold locally was imported from out-of-state or out-of-country.

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8.0 PROJECT TEAM

The project team consisted of the following individuals:

Mr. Fred E. Schultz, Team Leader, Biologist
Dr. Maureen M. Mulino, Biologist
Dr. Stephen E. Steimle, Environmental Engineer
Dr. Donna H. Redmann, Survey Specialist
Dr. John Francis, Biostatistician
Dr. Walter Keithly, Economist
Mr. Ray Albert, Technician
Mr. Floyd Belsome, Jr., Technician
Mr. John Ferrell, Technician
Mr. Randall Poincot, Technician

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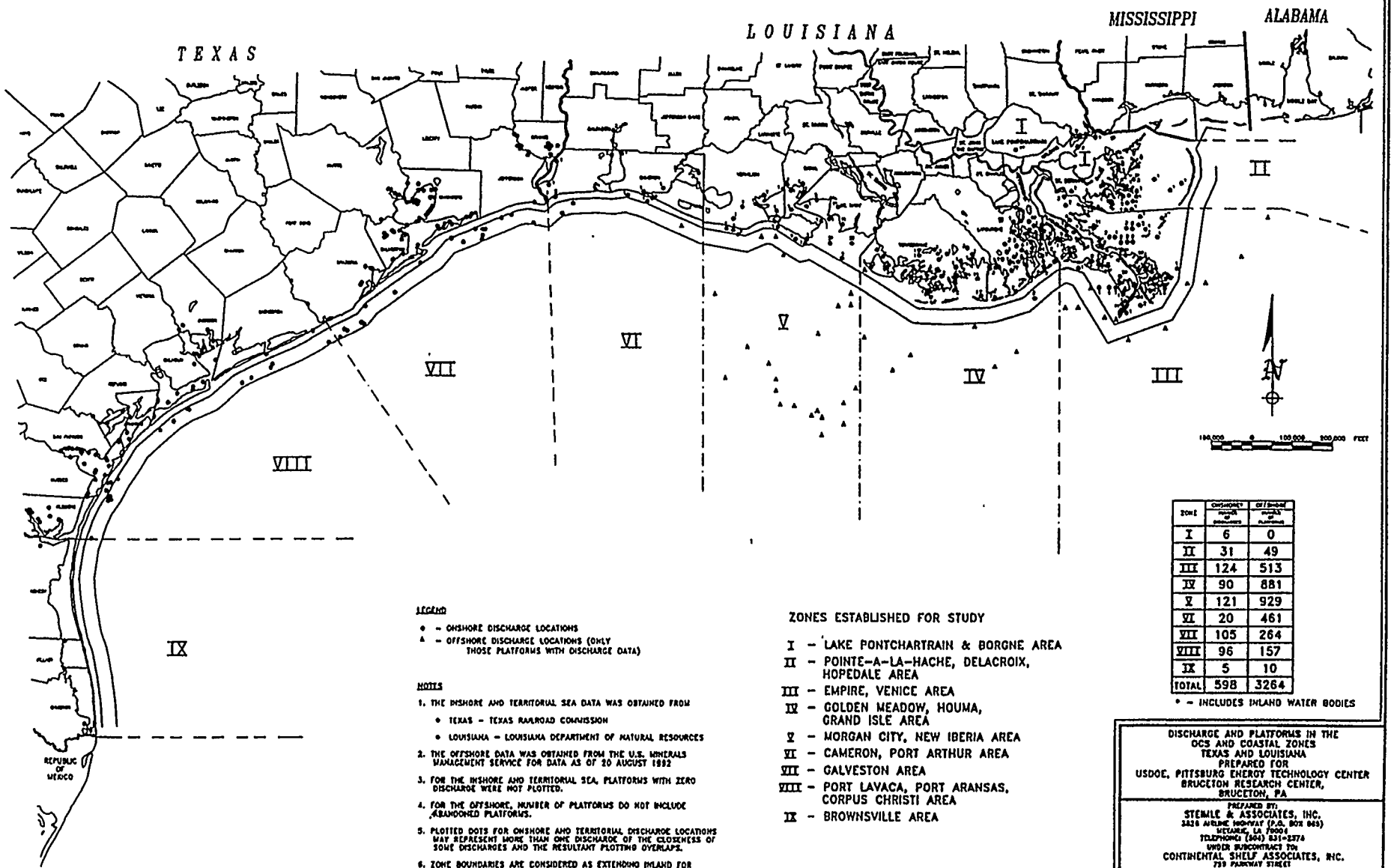
APPENDICES

APPENDIX A

Discharge Locations



ZONE	ONSHORE NUMBER OF DISCHARGES	OFFSHORE NUMBER OF PLATFORMS
I	6	0
II	31	49
III	124	513
IV	90	881
V	121	929
VI	20	461
VII	105	264
VIII	96	157
IX	5	10
TOTAL	598	3264

* - INCLUDES INLAND WATER BODIES

LEGEND

- ● - ONSHORE DISCHARGE LOCATIONS
- ▲ - OFFSHORE DISCHARGE LOCATIONS (ONLY THOSE PLATFORMS WITH DISCHARGE DATA)

NOTES

1. THE INSHORE AND TERRITORIAL SEA DATA WAS OBTAINED FROM
   - TEXAS - TEXAS RAILROAD COMMISSION
   - LOUISIANA - LOUISIANA DEPARTMENT OF NATURAL RESOURCES
2. THE OFFSHORE DATA WAS OBTAINED FROM THE U.S. MINERALS MANAGEMENT SERVICE FOR DATA AS OF 20 AUGUST 1992
3. FOR THE INSHORE AND TERRITORIAL SEA, PLATFORMS WITH ZERO DISCHARGE WERE NOT PLOTTED.
4. FOR THE OFFSHORE, NUMBER OF PLATFORMS DO NOT INCLUDE ABANDONED PLATFORMS.
5. PLOTTED DOTS FOR ONSHORE AND TERRITORIAL DISCHARGE LOCATIONS MAY REPRESENT MORE THAN ONE DISCHARGE OF THE CLOSENESS OF SOME DISCHARGES AND THE RESULTANT PLOTTING OVERLAPS.
6. ZONE BOUNDARIES ARE CONSIDERED AS EXTENDING INLAND FOR PURPOSES OF RECORDING THE ZONES OF INLAND DISCHARGES.

ZONES ESTABLISHED FOR STUDY

- I - LAKE PONTCHARTRAIN & BORGNE AREA
- II - POINTE-A-LA-HACHE, DELACROIX, HOPEDALE AREA
- III - EMPIRE, VENICE AREA
- IV - GOLDEN MEADOW, HOUMA, GRAND ISLE AREA
- V - MORGAN CITY, NEW IBERIA AREA
- VI - CAMERON, PORT ARTHUR AREA
- VII - GALVESTON AREA
- VIII - PORT LAVACA, PORT ARANSAS, CORPUS CHRISTI AREA
- IX - BROWNSVILLE AREA

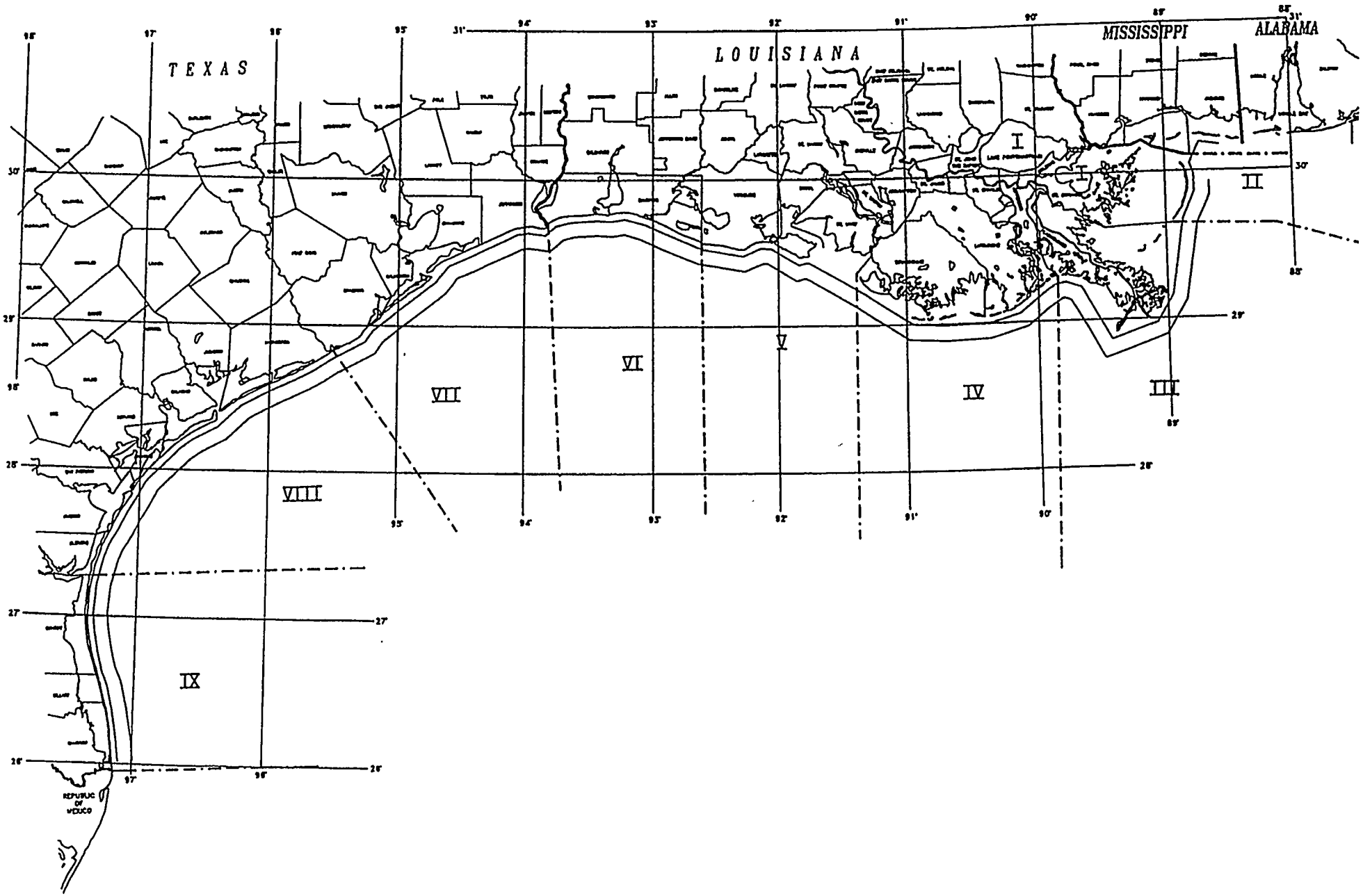
DISCHARGE AND PLATFORMS IN THE OCS AND COASTAL ZONES TEXAS AND LOUISIANA
PREPARED FOR
USDOE, PITTSBURG ENERGY TECHNOLOGY CENTER
BRUCETON RESEARCH CENTER,
BRUCETON, PA

PREPARED BY:
STEMLE & ASSOCIATES, INC.
3426 AIRLINE HIGHWAY (P.O. BOX 865)
METAIRIE, LA 70004
TELEPHONE: (504) 831-2374
UNDER SUBCONTRACT TO:
CONTINENTAL SHELF ASSOCIATES, INC.
759 PARKWAY STREET
JUPITER, FL 33477-4367
TELEPHONE: (407) 746-7960

DATE: 10/2/92 | JOB NO. 92-275-01
DRAWN BY: R.A.P. | CHECKED BY: E.E.S. | SCALE: 1"=100,000'

APPENDIX B

Survey Zones


TEXAS
LOUISIANA
MISSISSIPPI
ALABAMA
I
II
III
IV
V
VI
VII
VIII
IX
REPUBLIC OF MEXICO

APPENDIX C

Louisiana/Texas Recreational Fishermen Intercept Survey

FISHIE

P. O. BOX 1165 • METAIRIE, LA 70004
TELEPHONE (504) 831-2099 • FAX (504) 835-9410

LOUISIANA/TEXAS
RECREATIONAL FISHERMEN INTERCEPT QUESTIONNAIRE

Date of interview:_____ Case I.D. Number: _____
Time: _____a.m. _____p.m. Name of Interviewer: _____
Location of interview:_____
(dock, city, state)

Introduction:

Hello, I am _____ (name of interviewer), with FISHIE. We are conducting a profile study for the United States Department of Energy to determine what seafood is caught, distributed, and consumed. The purpose of this study is to gather information on the effects of oil/gas structures on the inshore and offshore waters and fisheries of coastal Louisiana and Texas. We have a letter of endorsement from _____(assoc/organization) concerning this study. (Show fisherman letter of endorsement.) May we take a few minutes of your time today to ask you a few questions about your seafood catch from today's fishing trip. Your name will not be associated with your response.

QUESTIONS:

1. FISHERMAN PROFILE.
   a. What category(s) have you fished over the past 3 months?
      ____fin fish ____shrimp ____crab ___oyster

   b. What type of fishing license(s) do you hold?
      _____ in-state
      _____ out-of-state
      _____ both in-state and out-of-state

   c. How many people in your household eat seafood? _____

   d. Please provide the following demographic information about you and all the people in your household:
      (1) Gender: ____Number of all Males ____ Number of all Females
      (2) Ages of Adults: _____,_____, _____, _____, _____, _____, _____
      (3) Number of children (under the age of 18): _____
      (4) Race:_____Black _____Hispanic _____Native American
          _____Oriental_____White_____Other: _____
      (5) How many females within your household are between the ages of 14 and 50? _____

2. MODE OF FISHING.
   a. How many fishing trips during the last three months have you made? _____trips

   b. How many of the fishing trips you indicated above were spent in each of the following situations/locations?
      _____ off pier, dock, jetty, breakwater, seawalls, bridge, causeway, and/or shorelines/beach/bank
      _____ private boat in inshore waters
      _____ private boat in offshore waters
      _____ charter/party boats

3. LOCATION OF SEAFOOD CATCH.
   a. On the map we have here, please show us the zone or region(s) across the Gulf Coast (Louisiana & Texas) where you fished in the past 3 months. (Indicate all that apply.)
      Zone/Regions: ___ 1 ___2 ___3 ___4 ___5 ___6 ___7 ___8 ___9.

   b. During the past 3 months approximately what percentage of your catch was caught
      _____% inshore (inside the barrier islands)?
      _____% less than 3 miles offshore (outside the barrier islands)?
      _____% 3 to 10 miles offshore?
      _____% greater than 10 miles offshore?
      100 % Total

   c. Based on your answers to question 2.b., please estimate the number of trips that were made at the following distances from offshore/inshore oil/gas platforms?
      _____ within 1,000 feet _____from ½ mile to a mile
      _____ from 1,000 feet to ½ mile _____more than a mile

4. SPECIES, QUANTITY, & DISTRIBUTION OF SEAFOOD CAUGHT. What species and approximate quantity of finfish and shellfish were caught and kept from your catch during the past 3 months? Of your total catch for each species, what percentage will be for personal consumption and what percentage will be given to others for consumption? Indicate (circle) the unit of measurements for quantity caught.
(Key: #=number, lb=pounds, doz=dozen, sa=sack)

Shellfish Caught	Quantity Caught	% Kept for Personal Use	% Given Away to Others
Shrimp	_____# lb	_____%	_____%
Blue Crab	_____# doz	_____%	_____%
Oysters	_____doz sa	_____%	_____%
Finfish Caught			
Amberjack	_____# lb	_____%	_____%
Black Drum	_____# lb	_____%	_____%
Croaker	_____# lb	_____%	_____%
Dolphin	_____# lb	_____%	_____%
Flounder	_____# lb	_____%	_____%
Grouper	_____# lb	_____%	_____%
Kingfish	_____# lb	_____%	_____%
King Mackerel	_____# lb	_____%	_____%
Redfish	_____# lb	_____%	_____%
Red Snapper	_____# lb	_____%	_____%
Shark	_____# lb	_____%	_____%
Sheepshead	_____# lb	_____%	_____%
Spanish Mackerel	_____# lb	_____%	_____%
Speckled Trout	_____# lb	_____%	_____%
Tuna	_____# lb	_____%	_____%
Vermilion Snapper	_____# lb	_____%	_____%
Other (Specify)			
_____	_____# lb	_____%	_____%
_____	_____# lb	_____%	_____%
_____	_____# lb	_____%	_____%

5. FREQUENCY OF FISH SERVED.
   a. On the average, how many times per week has fish that you caught during the past 3 months been served/eaten in your household? _____
   b. How many days has it been since the last meal served in your household was of fish you caught during the past 3 months? _____days _____This fish meal was not served.

6. PERSONAL CONSUMPTION AND USE PATTERNS. Of the fish you kept for your personal use, which species were eaten by you and the members of your household? What parts of the fish (meat and/or skin) were eaten?

	Finfish Parts Consumed	
	Meat Only	Skin & Meat
Finfish		
Amberjack	____	____
Black Drum	____	____
Croaker	____	____
Dolphin	____	____
Flounder	____	____
Grouper	____	____
Kingfish	____	____
King Mackerel	____	____
Redfish	____	____
Red Snapper	____	____
Shark	____	____
Sheepshead	____	____
Spanish Mackerel	____	____
Speckled Trout	____	____
Tuna	____	____
Vermilion Snapper	____	____
Other	____	____

7. COOKING METHODS. What method(s) of cooking were used to prepare the seafood you caught during the past 3 months? Check all that apply?
___baked, ___barbecued, ___blackened, ___boiled/poached, ___broiled, ___fried, ___ grilled, ___smoked, ___stew/soup, ___other (please specify_____)

8. What is the ZIP CODE where you currently live? _____

9. Have you been interviewed by us before? ____Yes _____No

10. Do you belong to a fishing sports club? ____Yes ____No
If yes, please provide name of club:_____
location of club: _____

Follow Up Information:

Would you provide us your name and telephone number for the purpose of a follow-up interview?
____Yes ____No

If Yes, what is your name? _____
What is your telephone: area code (_____) _____

What is your current address?

_____
_____
_____Zip Code_____

Thank you for your valuable time in providing this information!

APPENDIX D

Louisiana/Texas Recreational Fishermen Group Survey

FISHIE

P. O. BOX 1165 • METAIRIE, LA 70004
TELEPHONE (504) 831-2099 • FAX (504) 835-9410

LOUISIANA/TEXAS
RECREATIONAL FISHERMEN GROUP SURVEY

Dear Respondent:

We are conducting a profile study for the United States Department of Energy to determine what saltwater seafood is caught, distributed, and consumed. Your help is needed in gathering this information, and your responses will be kept confidential. The overall purpose of the study is to gather information that will be helpful in maintaining the integrity of our Seafood industry in the northern Gulf of Mexico.

DIRECTIONS:

Please answer all the following questions, as accurately as possible, concerning the source, quantities, and distribution of SALTWATER seafood caught by you during the last three months.

Please return in the enclosed self-addressed stamped envelope to:

FISHIE
P. O. Box 1165
Metairie, LA 70004

If you have any questions, contact:

Fred Schultz
504-831-2099

Saltwater Species Only
Time Period: Last Three Months

THANK YOU

QUESTIONS: **PLEASE PRINT**

1. FISHERMAN PROFILE.
   a. What category(s) have you fished over the past 3 months?
      ____fin fish ____shrimp ____crab ___oyster

   b. What type of fishing license(s) do you hold?
      _____ in-state
      _____ out-of-state
      _____ both in-state and out-of-state

   c. How many people in your household eat seafood? _____

   d. Please provide the following demographic information about you and all the people in your household:
      (1) Gender: ____Number of All Males ____ Number of All Females
      (2) Ages of Adults: _____, _____, _____, _____, _____, _____, _____
      (3) Number of children (under the age of 18): _____
      (4) Race:_____Black _____Hispanic _____Native American
      _____Oriental_____White_____Other: _____
      (5) How many females within your household are between the ages of 14 and 50? _____

2. MODE OF FISHING.
   a. How many fishing trips during the last three months have you made? _____trips

   b. How many of the fishing trips you indicated above were spent in each of the following situations/locations?
      _____ off pier, dock, jetty, breakwater, seawalls, bridge, causeway, and/or shorelines/beach/bank
      _____ private boat in inshore waters
      _____ private boat in offshore waters
      _____ charter/party boats

3. LOCATION OF SEAFOOD CATCH.
   a. Please check all the ports which you fish near. If you do not fish near any listed, please check the closest one to your fishing locations.

Louisiana Ports			Texas Ports
____Barataria	____Empire	___New Iberia	____Aransas Pass
____Bucktown	____Golden Meadow	___Venice	____Brownsville
____Cameron	____Grand Isle	___Yscloskey	____Freeport
____Chauvin	____Lafitte		____Galveston
____Delecroix	____Leesville		____Port Arthur
____Delcambre	____Mandeville		____Port Isabel
____Dulac	____Morgan City		____Rockport

   b. During the past 3 months, approximately what percentage of your catch was caught
      _____% inshore (inside the barrier islands)?
      _____% less than 3 miles offshore (outside the barrier islands)?
      _____% 3 to 10 miles offshore?
      _____% greater than 10 miles offshore?
      100 %

c. Based on your answers to question 2.b., please estimate the number of trips that were made at the following distances from offshore/inshore oil/gas platforms?

_____ within 1,000 feet _____ from ½ mile to a mile

_____ from 1,000 feet to ½ mile _____ more than a mile

4. SPECIES, QUANTITY, & DISTRIBUTION OF SEAFOOD CAUGHT. What species and approximate quantity of finfish and shellfish were caught and kept from your catch during the past 3 months? Of your total catch for each species, what percentage will be for personal consumption and what percentage will be given to others for consumption? Circle the unit of measurements for quantity caught.
(Key: #=number, lb=pounds, doz=dozen, sa=sack)

Shellfish Caught	Quantity Caught	% Kept for Personal Use	% Given Away to Others
Shrimp	_____# lb	_____%	_____%
Blue Crab	_____# doz	_____%	_____%
Oysters	_____doz sa	_____%	_____%
Finfish Caught			
Amberjack	_____# lb	_____%	_____%
Black Drum	_____# lb	_____%	_____%
Croaker	_____# lb	_____%	_____%
Dolphin	_____# lb	_____%	_____%
Flounder	_____# lb	_____%	_____%
Grouper	_____# lb	_____%	_____%
Kingfish	_____# lb	_____%	_____%
King Mackerel	_____# lb	_____%	_____%
Redfish	_____# lb	_____%	_____%
Red Snapper	_____# lb	_____%	_____%
Shark	_____# lb	_____%	_____%
Sheepshead	_____# lb	_____%	_____%
Spanish Mackerel	_____# lb	_____%	_____%
Speckled Trout	_____# lb	_____%	_____%
Tuna	_____# lb	_____%	_____%
Vermilion Snapper	_____# lb	_____%	_____%
Other (Specify)			
_____	_____# lb	_____%	_____%
_____	_____# lb	_____%	_____%
_____	_____# lb	_____%	_____%

5. FREQUENCY OF FISH SERVED.

a. On the average, how many times per week was fish that you caught during the past three months served/eaten in your household?_____

b. How many days has it been since the last meal served in your household was of fish you caught during the past 3 months? _____days _____This fish meal was not served.

6. PERSONAL CONSUMPTION AND USE PATTERNS. Of the fish listed below, please identify the species kept and eaten by you and members of your household by checking the appropriate column that describes which part(s) of the fish were eaten?

Finfish	Finfish Parts Consumed: Meat Only	Finfish Parts Consumed: Skin & Meat
Amberjack	_____	_____
Black Drum	_____	_____
Croaker	_____	_____
Dolphin	_____	_____
Flounder	_____	_____
Grouper	_____	_____
Kingfish	_____	_____
King Mackerel	_____	_____
Red Snapper	_____	_____

Finfish	Finfish Parts Consumed: Meat Only	Finfish Parts Consumed: Skin & Meat
Shark	_____	_____
Sheephead	_____	_____
Spanish Mackerel	_____	_____
Speckled Trout	_____	_____
Tuna	_____	_____
Vermilion Snapper	_____	_____
Other: (Please Specify)		
_____	_____	_____
_____	_____	_____

7. COOKING METHODS. What method(s) of cooking were used to prepare the seafood you caught during the past 3 months? Check all that apply?
___baked, ___barbequed, ___blackened, ___boiled/poached, ___broiled, ___fried, ___grilled, ___smoked, ___stew/soup, ___other (please specify_____).

8. What is the ZIP CODE where you currently live? _____

9. Have you been interviewed by us before? ____Yes _____No

Follow Up Information:

Your name will not be associated with your response. Would you provide us your name and telephone number for the purpose of a follow-up interview? ____Yes ____No

If Yes, what is your name? _____

What is your telephone: area code (_____) _____

What is your current address?

_____

_____

_____Zip Code_____

Thank you for your valuable time in providing this information!

APPENDIX E

Louisiana/Texas Commercial Fishermen Intercept Survey

FISHIE

P. O. BOX 1165 • METAIRIE, LA 70004
TELEPHONE (504) 831-2099 • FAX (504) 835-9410

LOUISIANA/TEXAS
COMMERCIAL FISHERMEN INTERCEPT QUESTIONNAIRE

Date of interview:_____ Case I.D. Number: _____
Time: _____a.m. _____p.m. Name of Interviewer: _____
Location of interview:_____
(dock, city, state)

Introduction:

Hello, I am _____ (name of interviewer), with FISHIE. We are conducting a profile study for the United States Department of Energy to determine what seafood is caught, distributed, and consumed. The purpose of this study is to gather information on the effects of oil/gas structures on the inshore and offshore waters and fisheries of coastal Louisiana and Texas. We have a letter of endorsement from _____(assoc/organization) concerning this study. (Show fisherman letter of endorsement.) May we take a few minutes of your time today to ask you a few questions about your seafood catch from today's fishing trip. Your name will not be associated with your response.

QUESTIONS:

1. FISHERMAN PROFILE.
   a. What category(s) have you fished in the past 3 months?
      ____fin fish ____shrimp ____crab ___oyster

   b. What type of fishing license(s) do you hold?
      _____ in-state
      _____ out-of-state
      _____ both in-state and out-of-state
      _____ Federal

   c. How many people in your household eat seafood? _____

   d. Please provide the following demographic information about you and all the people in your household:
      (1) Gender: ____Number of all Males ____ Number of all Females
      (2) Ages of Adults: _____, _____, _____, _____, _____, _____
      (3) Number of children (under the age of 18): _____
      (4) Race:_____Black _____Hispanic _____Native American
      _____Oriental_____White_____Other: _____
      (5) How many females within your household are betweem the ages of 14 and 50? _____

2. LOCATION OF SEAFOOD CATCH.

a. How many days have you fished in the past 3 months? _____days

b. On the map we have here, please show us the zone or region(s) across the Gulf Coast (Louisiana & Texas) where you fished in the past 3 months. (Indicate all that apply.)
Zone/Regions: ___ 1 ___2 ___3 ___4 ___5 ___6 ___7 ___8 ___9.

c. Approximately what percentage of your catch was caught:
_____% inshore (inside the barrier islands)?
_____% less than 3 miles offshore (outside the barrier islands)?
_____% 3 to 10 miles offshore?
_____% greater than 10 miles offshore?
100% Total

d. During the last 3 months, please estimate the number of trips that were made at the following distances from offshore/inshore oil/gas structures?
_____within 1,000 feet _____from ½ mile to a mile
_____from 1,000 feet to ½ mile _____more than a mile

3. SPECIES CAUGHT AND DISTRIBUTION OF SEAFOOD CATCH. During the past 3 months,
--What percentage of species were sold and to whom (Wholesalers or Processing Plants, Retailers or Restaurants, Consumers--friends/relatives, and Other)?
--What percentage for each species were given to others for consumption and/or were for personal consumption? (Indicate all that apply.)

	(A) % To be Sold To				(B) % Given Away to	(C) % to be Kept for	
	Whls/Process	Retail/Restr	Consumer	Other	Others	Personal	(A+B+C=100%)
Shellfish							
Shrimp	_____	_____	_____	_____	_____	_____	= 100%
Blue Crab	_____	_____	_____	_____	_____	_____	= 100%
Oysters	_____	_____	_____	_____	_____	_____	= 100%
Finfish							
Amberjack	_____	_____	_____	_____	_____	_____	= 100%
Black Drum	_____	_____	_____	_____	_____	_____	= 100%
Croaker	_____	_____	_____	_____	_____	_____	= 100%
Dolphin	_____	_____	_____	_____	_____	_____	= 100%
Flounder	_____	_____	_____	_____	_____	_____	= 100%
Grouper	_____	_____	_____	_____	_____	_____	= 100%
Kingfish	_____	_____	_____	_____	_____	_____	= 100%
King Mackerel	_____	_____	_____	_____	_____	_____	= 100%
Red Snapper	_____	_____	_____	_____	_____	_____	= 100%
Shark	_____	_____	_____	_____	_____	_____	= 100%
Sheepshead	_____	_____	_____	_____	_____	_____	= 100%
Spanish Mackerel	_____	_____	_____	_____	_____	_____	= 100%
Speckled Trout	_____	_____	_____	_____	_____	_____	= 100%
Tuna	_____	_____	_____	_____	_____	_____	= 100%
Vermilion Snapper	_____	_____	_____	_____	_____	_____	= 100%
Other							
_____	_____	_____	_____	_____	_____	_____	= 100%
_____	_____	_____	_____	_____	_____	_____	= 100%
_____	_____	_____	_____	_____	_____	_____	= 100%

5. FREQUENCY OF SEAFOOD SERVED.

a. On the average, how many times per week was fish that you caught during the last 3 months served/eaten in your household?_____

b. How many days has it been since the last meal served in your household was of seafood you caught and kept for personal consumption during the past 3 months? _____days _____This fish meal was not served.

6. PERSONAL CONSUMPTION AND USE PATTERNS. Of the fish you kept for your personal use, which species were eaten by you and the members of your household? What parts of the fish (meat and/or skin) were served/eaten?

Finfish	Finfish Parts Consumed: Meat Only	Finfish Parts Consumed: Skin & Meat
Amberjack	_____	_____
Black Drum	_____	_____
Croaker	_____	_____
Dolphin	_____	_____
Flounder	_____	_____
Grouper	_____	_____
Kingfish	_____	_____
King Mackerel	_____	_____
Redfish	_____	_____
Red Snapper	_____	_____

Finfish	Finfish Parts Consumed: Meat Only	Finfish Parts Consumed: Skin & Meat
Shark	_____	_____
Sheepshead	_____	_____
Spanish Mackerel	_____	_____
Speckled Trout	_____	_____
Tuna	_____	_____
Vermilion Snapper	_____	_____
Other: (Please Specify)		
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. COOKING METHODS. What method of cooking were used to prepare the seafood you caught during the past 3 months? Indicate all that apply (please specify).

___baked, ___barbecued, ___blackened, ___boiled/poached, ___broiled, ___fried,
___grilled, ___smoked, ___stew/soup, ___other (please specify_____)

8. What is the ZIP CODE where you currently live? _____

9. Have you been interviewed by us before? ____Yes _____No

Follow-Up Information:

For the purpose of a follow-up interview, would you provide us with your name and address?
____Yes ____No

If Yes, what is your name? _____
What is your telephone: area code (_____) _____

What is your current business name & address?

_____

_____

_____Zip Code_____

Thank you for your valuable time in providing this information!

APPENDIX F

Louisiana/Texas Oyster Fishermen Intercept Survey

FISHIE

P. O. BOX 1165 • METAIRIE, LA 70004
TELEPHONE (504) 831-2099 • FAX (504) 835-9410

LOUISIANA/TEXAS
COMMERCIAL OYSTER FISHERMEN INTERCEPT QUESTIONNAIRE

Date of interview:_____ Case I.D. Number: _____
Time: _____a.m. _____p.m. Name of Interviewer: _____
Location of interview:_____
(dock, city, state)

Introduction:

Hello, I am _____ (name of interviewer), with FISHIE. We are conducting a profile study for the United States Department of Energy to determine what seafood is caught, distributed, and consumed. The purpose of this study is to gather information on the effects of oil/gas structures on the inshore and offshore waters and fisheries of coastal Louisiana and Texas. May we take a few minutes of your time today to ask you a few questions about your seafood catch from today's fishing trip. Your name will not be associated with your response.

QUESTIONS:

1. FISHERMAN PROFILE.
   a. How many acres of oyster grounds under lease? _____ Include leases you and/or family members hold and others.

   b. What type of fishing license(s) do you hold?
      _____ in-state
      _____ out-of-state
      _____ both in-state and out-of-state
      _____ Federal

   c. How many people in your household eat oysters? _____

   d. Please provide the following demographic information about you and all the people in your household:
      (1) Gender: ____Number of all Males ____ Number of all Females
      (2) Ages of Adults: _____, _____, _____, _____, _____, _____
      (3) Number of children (under the age of 18): _____
      (4) Race:_____Black _____Hispanic _____Native American
      _____Oriental_____White_____Other: _____
      (5) How many females within your household are between the ages of 14 and 50? _____

2. LOCATION OF SEAFOOD CATCH.

a. How many days have you fished in the past 3 months? _____days

b. On the map we have here, please show us the zone or region(s) across the Gulf Coast (Louisiana & Texas) where you fished in the past 3 months. (Indicate all that apply.)
Zone/Regions: ___ 1 ___2 ___3 ___4 ___5 ___6 ___7 ___8 ___9.

c. Approximately what percentage of your catch was caught:
_____% inshore (inside the barrier islands)?
_____% less than 3 miles offshore (outside the barrier islands)?
_____% 3 to 10 miles offshore?

100% Total

d. During the last 3 months, please estimate the number of trips that were made at the following distances from offshore/inshore oil/gas structures?
_____within 1,000 feet _____from ½ mile to a mile
_____from 1,000 feet to ½ mile _____more than a mile

3. DISTRIBUTION OF OYSTER CATCH. During the past 3 months,
–What percentage of species were sold and to whom (Wholesalers or Processing Plants, Retailers or Restaurants, Consumers--friends/relatives, and Other)?
–What percentage for each species were given to others for consumption and/or were for personal consumption? (Indicate all that apply.)

	(A) % To be Sold To				(B) % Given Away to Others	(C) % to be Kept for Personal	
	Whls/Process	Retail/Restr	Consumer	Other			(A+B+C=100%)
Shellfish Oysters	_____	_____	_____	____	_____	_____	= 100%

4. FREQUENCY OF OYSTERS SERVED.

a. On the average, how many times per week were oysters that you caught during the last 3 months served/eaten in your household? _____

b. How many days has it been since the last meal served in your household was of oysters you caught and kept for personal consumption during the past 3 months? _____days _____This oyster meal was not served.

5. PERSONAL CONSUMPTION AND USE PATTERNS. What percentage of oysters eaten by you and your family are eaten raw? _____%

6. COOKING METHODS. What method of cooking were used to prepare the seafood you caught during the past 3 months? Indicate all that apply (please specify).

___raw, ___baked, ___barbecued, ___blackened, ___boiled/poached, ___broiled, ___fried,
___grilled, ___smoked, ___stew/soup, ___other (please specify_____)

7. What is the ZIP CODE where you currently live? _____

8. Have you been interviewed by us before? ____Yes _____No

Follow-Up Information:

For the purpose of a follow-up interview, would you provide us with your name and address?
____Yes ____No

If Yes, what is your name? _____
What is your telephone: area code (_____) _____

What is your current business name & address?

_____

_____

_____Zip Code_____

Thank you for your valuable time in providing this information!

APPENDIX G

Louisiana/Texas Processors & Wholesalers Mail Survey

FISHIE

P. O. BOX 1165 • METAIRIE, LA 70004
TELEPHONE (504) 831-2099 • FAX (504) 835-9410

LOUISIANA/TEXAS
PROCESSOR'S & WHOLESALER'S SURVEY

Dear Respondent:

We are conducting a profile study for the United States Department of Energy to address the lack of information on the effects of oil and structures on the inshore and offshore coastal waters and fisheries of Louisiana and Texas. Specifically, this study is being conducted to determine what saltwater seafood is caught, distributed, and consumed. Your help is needed in gathering this data, and your responses will be kept confidential. The overall purpose of the study is to gather information that will be helpful in maintaining the integrity of our Seafood industry in the northern Gulf of Mexico.

DIRECTIONS:

Please answer all the following questions, as accurately as possible, concerning the source, quantities, and distribution of SALTWATER seafood sold by your company from January 1, 1992 through December 31, 1992.

Please indicate whether you operate: _____ *as a Processor only*
_____ *as a Wholesaler/Dealer only*
_____ *both as a Processor and a Wholesaler/Dealer*

PLEASE PRINT

Saltwater Species Only
Time Period: January 1, 1992 through December 31, 1992

Please return in the enclosed self-addressed stamped envelope to:
FISHIE
P. O. Box 1165
Metairie, LA 70004

If you have any questions, contact:
Fred Schultz
(504)-831-2099

THANK YOU

QUESTIONS:

1. SOURCES OF SALTWATER SEAFOOD: Please provide an estimate of the percentage of saltwater finfish and shellfish you bought from the following sources for the time period of January 1 through December 31, 1992.

	Percentage			
	Saltwater	Shellfish		
Source	Finfish	Shrimp	Oyster	Blue Crab
a. in-state commercial fishermen?	_____%	_____%	_____%	_____%
b. in-state wholesalers/dealers?	_____%	_____%	_____%	_____%
c. in-state processing plants?	_____%	_____%	_____%	_____%
d. out-of-state sources?	_____%	_____%	_____%	_____%
e. out-of-country sources?	_____%	_____%	_____%	_____%
	100%	100%	100%	100%

2. FISHING SITES: If commercial fishermen are the suppliers of your saltwater seafood, what percentage of them fish:
   a. inshore (inside barrier islands)? _____%
   b. of those who fish inshore (a.), how many fish near inshore oil/gas platforms? _____%
   c. offshore (outside barrier islands)? _____%
   d. of those who fish offshore (c.), how many fish near offshore oil/gas platforms? _____%

3. SUPPLIERS'S FISHING PORTS: If you use commercial fishermen/docks for suppliers of your seafood, please check all the port(s) where these suppliers are located.

Louisiana Ports			Texas Ports
____Barataria	____Empire	____New Iberia	____Aransas Pass
____Bucktown	____Golden Meadow	____Venice	____Brownsville
____Cameron	____Grand Isle	____Yscloskey	____Freeport
____Chauvin	____Lafitte		____Galveston
____Delecroix	____Leesville		____Port Arthur
____Delcambre	____Mandeville		____Port Isabel
____Dulac	____Morgan City		____Rockport

4. QUANTITY OBTAINED: Please provide an estimate of the quantities of saltwater seafood you handled for the time period of January 1 through December 31, 1992. Please specify quantity in product weight and units of measurement.

(PLEASE SPECIFY UNITS)

Saltwater Fish:	Qty.	Unit	Shrimp:	Qty.	Unit
whole fish*	_____	____	heads-on	_____	____
fish parts	_____	____	heads-off	_____	____

*includes gutted and headless

(PLEASE SPECIFY UNITS)

Oysters:	Qty.	Unit	Blue Crabs:	Qty.	Unit
Oysters in shell	_____	____	Hard shell	_____	____
Oyster meat	_____	____	Soft shell	_____	____
			Crab meat	_____	____

5. DISTRIBUTION OF SHELLFISH: Please provide an estimate of the percentage of the total shellfish sold to the following outlets for all of 1992. Note: For the purpose of this study, Louisiana and Texas are not considered out-of-state.

	SOLD TO IN-STATE OUTLETS				OUT-OF-STATE
	Wholesalers /Dealers	Processing Plants	Restaurants /Retailers	Other* Outlets	All Outlets (except LA/TX)
Shrimp	_____%	_____%	_____%	_____%	_____% = 100%
Oysters	_____%	_____%	_____%	_____%	_____% = 100%
Blue Crabs:					
Hard shell	_____%	_____%	_____%	_____%	_____% = 100%
Soft shell	_____%	_____%	_____%	_____%	_____% = 100%
Crab meat	_____%	_____%	_____%	_____%	_____% = 100%

*For Other Outlets please list. _____

6. DISTRIBUTION OF SALTWATER FINFISH: Please provide an estimate of the percentage of the total saltwater finfish sold to the following outlets for all of 1992. Note: For the purpose of this study, Louisiana and Texas are not considered out-of-state.

	SOLD TO IN-STATE OUTLETS				OUT-OF-STATE
	Wholesalers /Dealers	Processing Plants	Restaurants /Retailers	Other* Outlets	All Outlets (except LA/TX)
Black Drum	_____%	_____%	_____%	_____%	_____% = 100%
Flounder	_____%	_____%	_____%	_____%	_____% = 100%
Red Snapper	_____%	_____%	_____%	_____%	_____% = 100%
Sheepshead	_____%	_____%	_____%	_____%	_____% = 100%
Speckled Trout	_____%	_____%	_____%	_____%	_____% = 100%
Tuna	_____%	_____%	_____%	_____%	_____% = 100%
Vermilion Snapper	_____%	_____%	_____%	_____%	_____% = 100%

*For Other Outlets please list. _____

7. OTHER SALTWATER FINFISH.

a. Do you handle any of the following finfish? Please circle "YES" or "NO", as appropriate.

		Handle?	
1.	Amberjack	YES	NO
2.	Croaker	YES	NO
3.	Dolphin	YES	NO
4.	Grouper	YES	NO
5.	King Mackerel	YES	NO
6.	Shark	YES	NO
7.	Kingfish	YES	NO
8.	Spanish Mackerel	YES	NO
9.	Other:_____	YES	NO

b. What percentage of your total finfish is represented by the species listed in 7.a.(1-9) combined? _____%

8. PRODUCT FORM OF SEAFOOD SOLD. Please circle the form(s) you commonly sell of the following seafood:

	Form Commonly Sold			
Shellfish				
Oysters	in shell	shucked	prepared products (e.g. breaded/gumbo)	
Blue Crabs	whole	meat	prepared products (e.g. stuffed)	
Shrimp	heads-on headless shell on	peeled & undeveined peeled & deveined	prepared products (e.g. breaded/gumbo)	
FinFish				
Black Drum	whole fish	fillets with skin	skinless fillets	other
Flounder	whole fish	fillets with skin	skinless fillets	other
Red Snapper	whole fish	fillets with skin	skinless fillets	other
Sheepshead	whole fish	fillets with skin	skinless fillets	other
Speckled Trout	whole fish	fillets with skin	skinless fillets	other
Tuna	whole fish	fillets with skin	skinless fillets	other
Vermilion Snapper	whole fish	fillets with skin	skinless fillets	other
Other Finfish (Please indicate)				
_____	whole fish	fillets with skin	skinless fillets	other
_____	whole fish	fillets with skin	skinless fillets	other
_____	whole fish	fillets with skin	skinless fillets	other

9. For other phases of this study, will you permit us to contact you for a list of your major seafood suppliers? _____Yes _____No

10. What is the ZIP CODE where your company is located?_____

Follow-up Information:

Your name and the name of your company will not be associated with your response. For the purpose of conducting a follow-up interview, would you provide us with your name and address?
___ Yes ___ No.

If Yes, please print your name, company name, company address, and telephone:

_____

_____

_____

Telephone: Area Code (_____) _____

THANK YOU

APPENDIX H

Louisiana/Texas Retail Seafood Market Onsite Survey

FISHIE

P. O. BOX 1165 • METAIRIE, LA 70004
TELEPHONE (504) 831-2099 • FAX (504) 835-9410

LOUISIANA/TEXAS
RETAIL SEAFOOD MARKET ON-SITE SURVEY

RETAIL SEAFOOD MARKET PROFILE:

Name of Market:_____
Address: _____
_____
State: _____
Parish/County: _____

DATE & TIME MARKET DATA WAS COLLECTED:

Date:_____ Day of Week:_____ Time of Day: _____

MARKET DATA GATHERED BY:_____

DIRECTIONS: Use a check mark to indicate whether type of shellfish or finfish was sold. Also indicate how seafood was prepared if sold cooked (e.g. boiled, gumbo, stuffed, etouffee, etc.).

SHELLFISH SOLD	SOLD UNCOOKED	SOLD COOKED (Specify how prepared)
Blue Crabs--Hard Shell		
Blue Crabs--Soft Shell		
Blue Crabs--Crab Meat		
Oysters--Whole (with shell)		
Oysters--Meat		
Shrimp--Heads-on		
Shrimp--Heads-off		
Shrimp--Peeled		

Continue to backside of page.....

FINFISH SOLD	WHOLE FISH		FISH FILLETS		PARTS	COOKED
	With Skin	Without Skin	With Skin	Without Skin	(Specify parts)	(Specify how prepared)
Amberjack						
Black Drum						
Croaker						
Dolphin						
Flounder						
Grouper						
Kingfish						
King Mackerel						
Red Snapper						
Shark						
Sheepshead						
Spanish Mackerel						
Speckled Trout						
Tuna						

Do you ship saltwater seafood to other areas of the state? ____Yes ____No

Do you ship saltwater seafood out of State? ____Yes ____No

APPENDIX I

Louisiana/Texas Restaurant Mail Survey

FISHIE

P. O. BOX 1165 • METAIRIE, LA 70004
TELEPHONE (504) 831-2099 • FAX (504) 835-9410

TEXAS
RESTAURANT MAIL SURVEY

Dear Respondent:

We are conducting a profile study for the United States Department of Energy to address the lack of information on the effects of oil and gas structures on the inshore and offshore coastal waters and fisheries of Louisiana and Texas. Specifically, this study is being conducted to determine what saltwater seafood is caught, distributed, and consumed. Your help is needed in gathering this data, and your responses will be kept confidential. The overall purpose of the study is to gather information that will be helpful in maintaining the integrity of our Seafood industry in the northern Gulf of Mexico.

DIRECTIONS:

Please answer all the following questions, as accurately as possible, concerning the source, quantities, and method of preparation of SALTWATER seafood served/sold by your restaurant from January 1, 1992 through December 31, 1992.

P L E A S E P R I N T

Saltwater Species Only
Time Period: January 1, 1992 through December 31, 1992

Please return in the enclosed self-addressed stamped envelope to:

FISHIE
P. O. Box 1165
Metairie, LA 70004

If you have any questions, contact:

Fred Schultz
(504)-831-2099

THANK YOU

QUESTIONS:

1. Approximately how many seafood dishes were served per week for the year 1992? _____

2. Approximately what percentage of the seafood dishes served for the year 1992 were shellfish and/or were finfish?
   a. _____% Shellfish
   b. _____% Finfish
   c. _____% Shellfish & Finfish
   100 % TOTAL

3. On the average per week for the year 1992, what percentage of shellfish dishes were:

   a. _____% Blue Crabs--Soft Shell
   b. _____% Blue Crabs--Other
   c. _____% Oysters on the Half Shell
   d. _____% Oyster Meat
   e. _____% Shrimp
   f. _____% Other
   100 % TOTAL

4. For the year 1992, what type of shellfish was used to prepare stock?

   a. _____ Blue Crab
   b. _____ Shrimp
   c. _____ Oysters

5. On the average per week for the year 1992, what percentage of finfish dishes were:

   a. _____% Amberjack
   b. _____% Black Drum
   c. _____% Croaker
   d. _____% Dolphin
   e. _____% Flounder
   f. _____% Grouper
   g. _____% Kingfish
   h. _____% King Mackerel
   i. _____% Redfish
   j. _____% Red Snapper
   k. _____% Shark
   l. _____% Sheepshead
   m. _____% Spanish Mackerel
   n. _____% Speckled Trout
   o. _____% Tuna
   p. _____% Vermilion Snapper
   q. _____% Other
   100 % TOTAL

6. Approximately how many seafood meals per week for the year 1992, included seafood stock in their preparation?

   a. _____ Stock made from Shellfish
   b. _____ Stock made from Finfish
   c. _____ Stock made from both Shellfish and Finfish

7. What percentage of your saltwater seafood was imported from areas other than Louisiana or Texas for the year 1992? _____%

8. What percentage of your seafood did you receive from the following sources for the year 1992?
____% Commercial Fisherman
____% Wholesalers/Processors
____% Retailers
____% Other
100 % TOTAL

9. Of the fish served for consumption by your restaurant for the year 1992, what parts of the fish (meat and/or skin) were consumed? What fish were used for stock? Check all that apply.

	Finfish Parts Consumed		
	Meat Only	Skin & Meat	Used In Stock
Finfish			
Amberjack	____	____	____
Black Drum	____	____	____
Croaker	____	____	____
Dolphin	____	____	____
Flounder	____	____	____
Grouper	____	____	____
Kingfish	____	____	____
King Mackerel	____	____	____
Redfish	____	____	____
Red Snapper	____	____	____
Shark	____	____	____
Sheepshead	____	____	____
Spanish Mackerel	____	____	____
Speckled Trout	____	____	____
Tuna	____	____	____
Vermilion Snapper	____	____	____
Other:(specify)_____	____	____	____

10. What method(s) of cooking were used for the year 1992 to prepare the seafood you served? Check all that apply.
___baked, ___barbequed, ___blackened, ___boiled/poached, ___broiled,
___fried, ___grilled, ___smoked, ___stew/soup, ___other.

11. What is the ZIP CODE where your restaurant is located?_____

Follow-Up Information:

Your name and the name of your restaurant will not be associated with your response. For the purpose of conducting a follow-up interview, would you provide us with your name and address?
___ Yes ___ No.

If Yes, please print your name, restaurant name, address, and telephone:

_____

_____

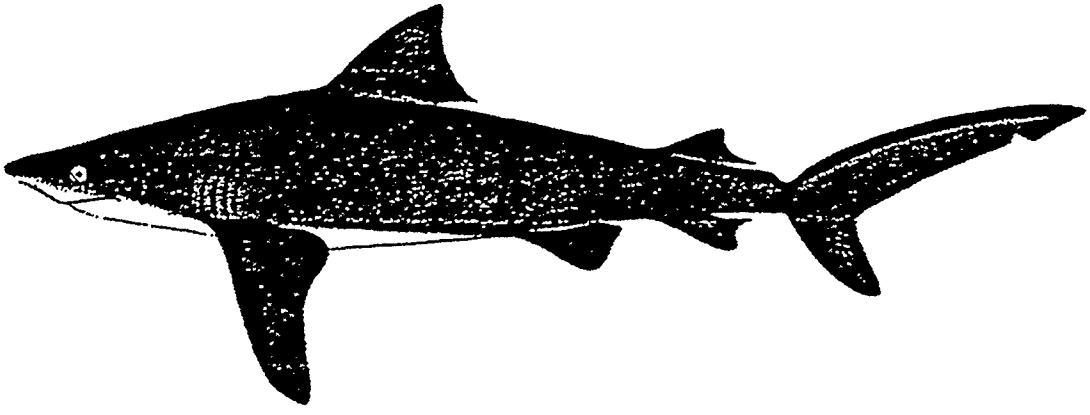
_____

Telephone: Area Code (_____) _____

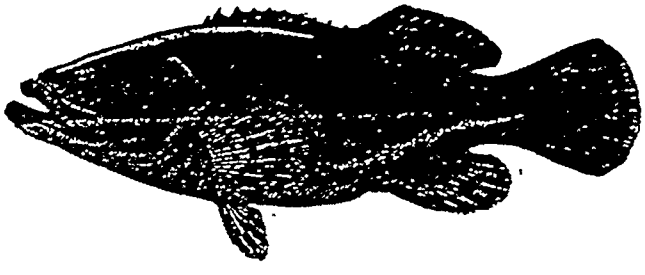
Thank you for your valuable time in providing this information!

APPENDIX J

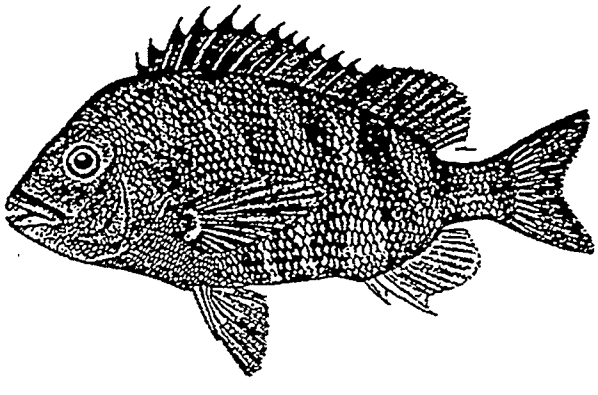
Finfish Identification Guide



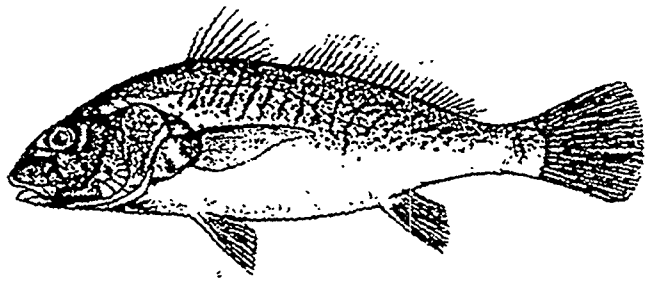
SHARK



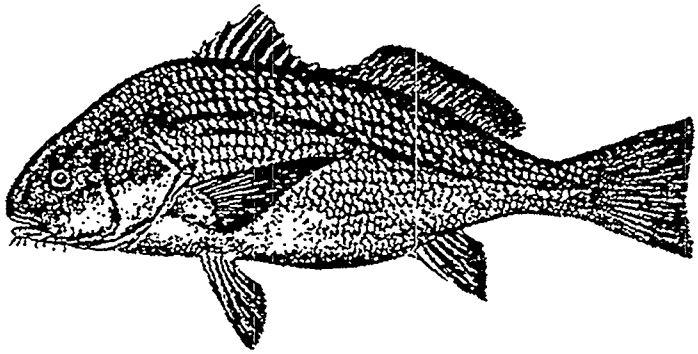
GROUPER



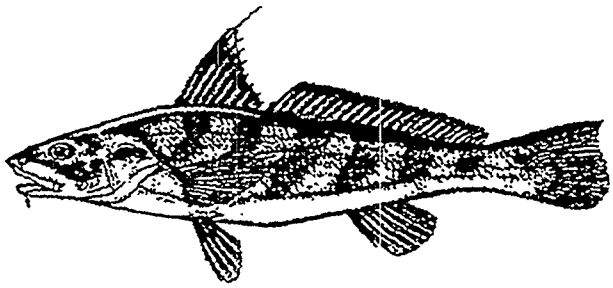
SHEEPSHEAD



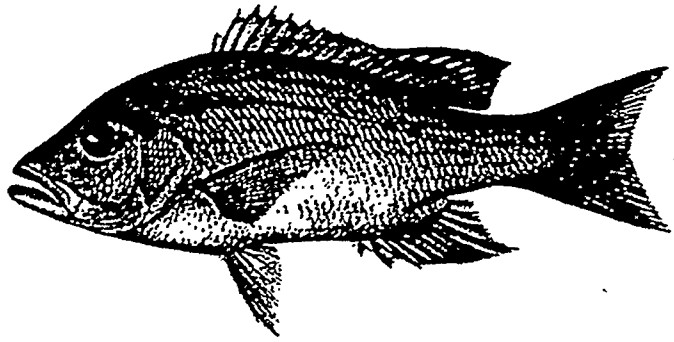
CROAKER



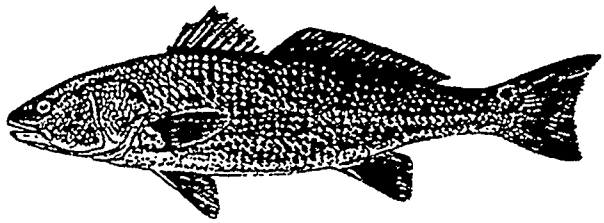
BLACK DRUM



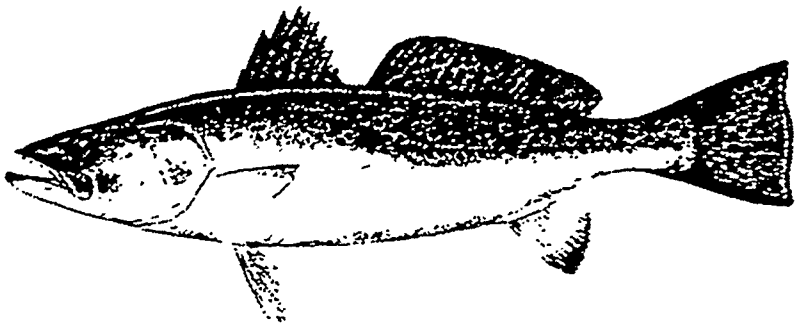
KINGFISH



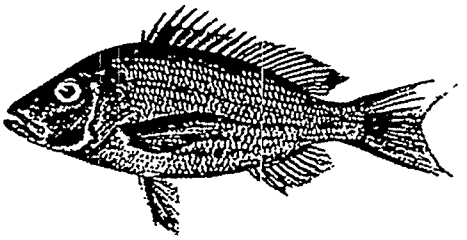
RED SNAPPER



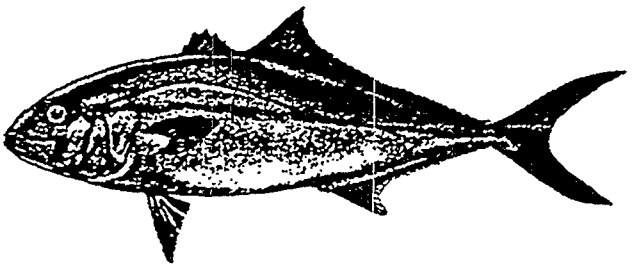
RED FISH



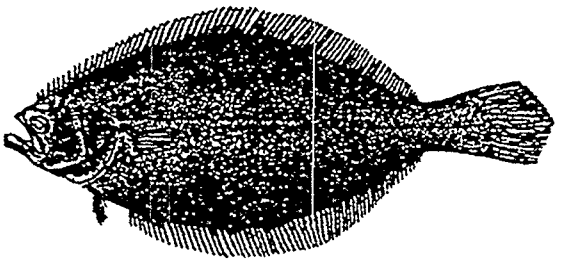
SPECKLED TROUT



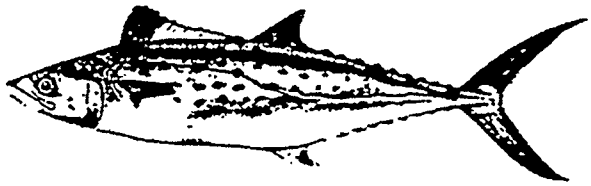
VERMILION SNAPPER



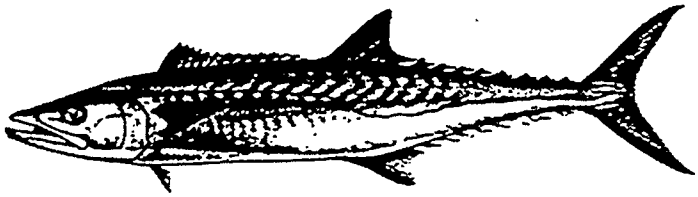
AMBERJACK



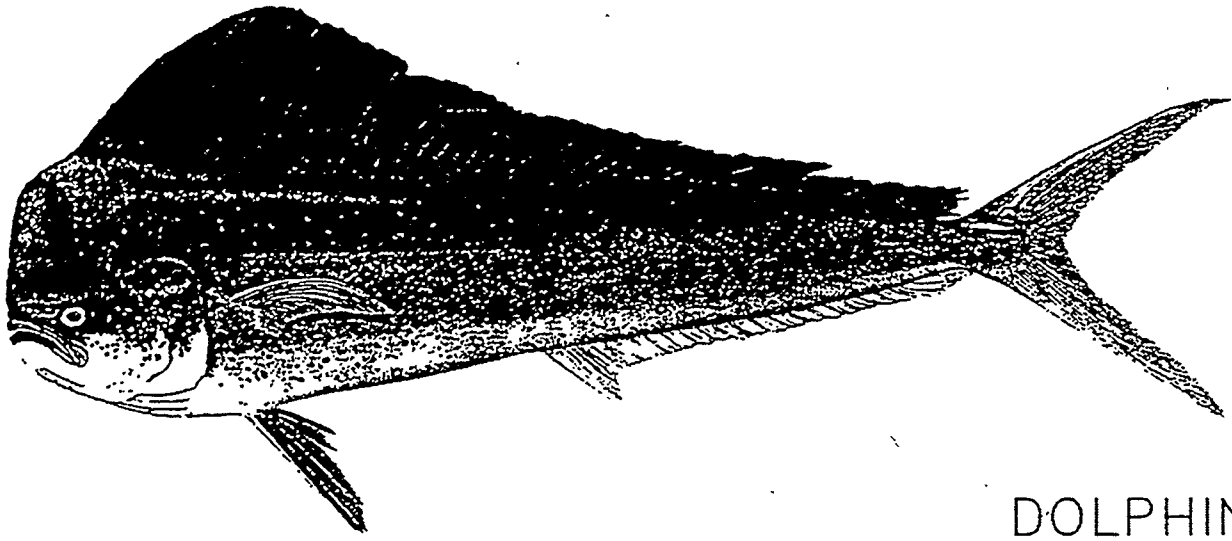
FLOUNDER



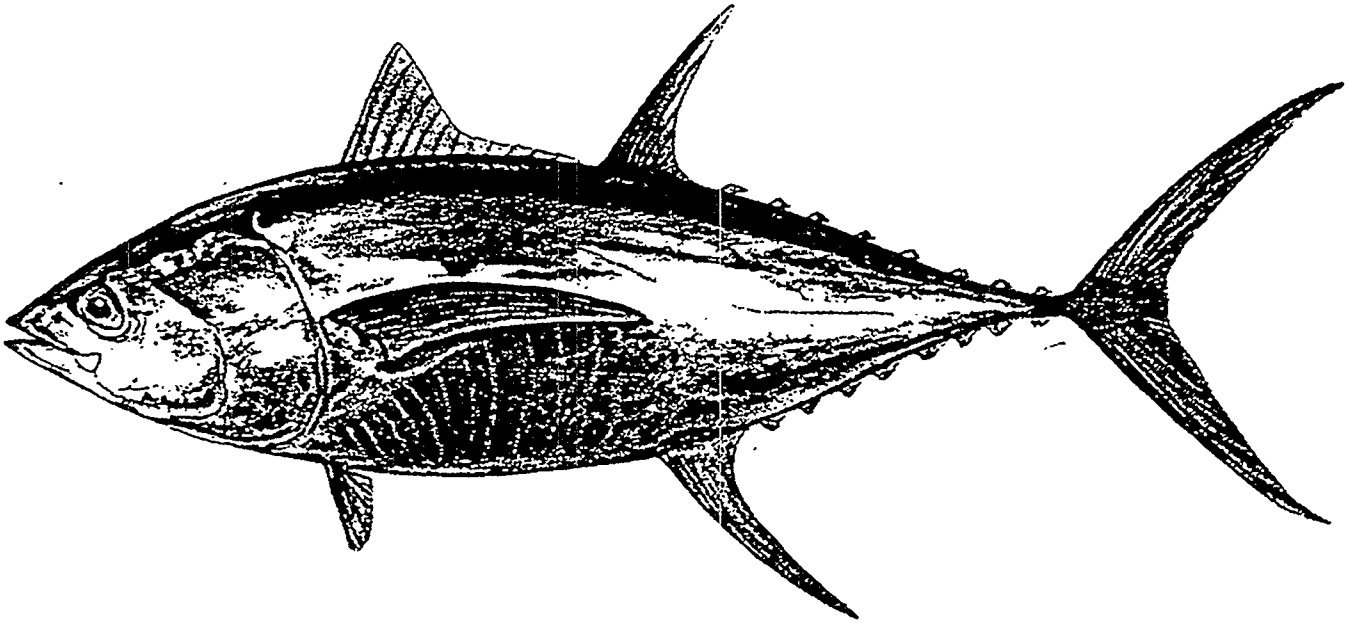
SPANISH MACKEREL



KING MACKEREL



DOLPHIN



TUNA

APPENDIX K

Letters of Support/Endorsements

Louisiana
Seafood

M E M O R A N D U M

TO: Louisiana Seafood Processors

KT

FROM: Karl Turner, Executive Director

DATE: March 17, 1993

This letter is sent to request your participation in a survey that is being conducted by Fisheries Information & Seafood Harvest Inquiry Enterprise (FISHIE) in conjunction with the US Department of Energy. The purpose of the survey is to determine what saltwater seafood is caught, where it is distributed and who consumes it.

I have reviewed the research proposal as well as the survey questionnaire. I strongly encourage you to cooperate.

The information obtained through this project will be helpful in maintaining the integrity of the Louisiana Seafood Industry.

KT:wgh

Louisiana Seafood Promotion & Marketing Board

Texas Restaurant Association

Dear Restaurant Operator:

Fisheries Information & Seafood Harvest Inquiry Enterprise (FISHIE) is conducting a survey for the U. S. Department of Energy to study the effects of oil and gas structures on the inshore and offshore coastal waters along with the fisheries industry of Texas and Louisiana.

One phase of the study involves analyzing the collection, distribution and consumption patterns of saltwater seafood caught from the coastal regions of Texas and Louisiana. Surveys are being conducted of restaurants, commercial/recreational fishermen, wholesalers, processors and retailers to obtain some of this data.

Upon completion of the project, the findings of the study will be made available to the public. Prior to the completion of the study, preliminary results can be made available to respondents of the survey questionnaire. Restaurateurs may find the results useful for the offerings of the restaurant, e.g. seafood items which are most popular or the most common method of preparation.

We encourage you to participate in this valuable research. The results of the research will benefit restaurateurs by identifying the preferred eating habits of consumers, as well as the commonly served type of saltwater seafood. Your assistance and cooperation will be greatly appreciated towards the completion of this project. If you have any questions, please contact Mr. Fred E. Schultz, FISHIE, 504/831-2099

Sincerely

W. Kent Hughes

W. Kent Hughes, CAE
Senior Vice President

1400 Lavaca P.O. Box 1429
Austin, Texas 78767-1429
512/472-3666 800/395-2872
FAX 512/472-2777

APPENDIX L

Louisiana Restaurant Association Newsletter

Louisiana Restaurant Association
HOSPITALITY NEWSLINE

2800 Veterans Blvd., Suite 160 • Metairie, LA 70002-6101 • (504) 831-7788 • FAX (504) 837-4967

VOLUME XIII, NUMBER 7 JULY 1993

Dear LRA Members:

I want to take the opportunity to extend to you a special invitation to attend the LRA's 40th annual Louisiana Foodservice & Hospitality Exposition to be held August 7, 8 and 9, 1993 . The New Orleans Convention Center, Hall F will be the site of this year's Expo. Over 14,000 industry professionals are expected to visit the record 445 booths, which will display innovations in foodservice products, services and equipment.

There is an entire menu of activities planned in conjunction with this years expo, including the New Orleans Chapter's annual golf tournament and the first-ever LRA Culinary Classic Sprint. One event you won't want to miss is the **President's Grand Reception & Awards Banquet** , which will be held at the Westin Canal Place on Sunday, August 8. It is on this night that the LRA bestows its most prestigious honors: *Restaurateur of the Year, Hall of Fame and Distinguished Service Awards, Active and Associate Members of the Year, Chapter and Chapter President of the Year.* Come join other members and friends from around the state for this elegant evening of exquisite cuisine, honoring outstanding members of Louisiana's foodservice industry.

I am pleased to announce that we will have our most extensive educational seminar schedule ever at this year's show. The diverse listing has something for everyone and will certainly draw many to the show. All seminars will be free of charge with expo registration. We will again be offering at this year's show the Foodservice Management Professional (FMP) Certification.

Expo '93 represents an outstanding opportunity. It's a unique showcase where you can see your peers, exchange ideas and benefit from an interchange of experiences. Expo is the symbol of our industry at its best and at the same time, it is our working platform for advancing the foodservice industry as a collective force.

Sincerely,

Jim

Jim

NEWSLETTER HIGHLIGHTS

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HOW TO GET THE MOST OUT OF YOUR VISIT TO THE EXPO	Pg. 4
FOOD & DRUG ADMINISTRATION REVOKES RESTAURANT EXEMPTION ON MENU LABELING	Pg. 5
STATE WARNS CRAWFISH PACKERS, FINES NEXT	Pg. 5
NO DEDUCTIONS FOR "LOBBYING", INCLUDING ASSOCIATION DUES	Pg. 6
SEAFOOD SURVEY TO BE CONDUCTED	Pg. 6
GET YOUR TICKETS EARLY	Pg. 7
UNEMPLOYMENT COMPENSATION TAX SET TO EXPIRE...MAYBE	Pg. 7
SIN TAX WILL RESULT IN FEWER JOBS	Pg. 8
FIRST LRA SANITATION CERTIFICATION SUCCESSFUL; ROOM AVAILABLE FOR NEXT SESSION	Pg. 8
LRA CREDIT CARD ACCEPTANCE PROGRAM ANNOUNCES NEW RATES	Pg. 9
CALENDAR OF SPECIAL EVENTS	Pg. 10
ALONG THE BAYOU	Pg. 10
YOUR NEWS IS GOOD NEWS	Pg. 11

EDITOR'S NOTE: BECAUSE OF THE TIME REQUIRED TO PRINT *HOSPITALITY NEWSLINE*, THE STATUS OF VARIOUS ISSUES DISCUSSED MAY HAVE CHANGED BY THE TIME THE NEWSLETTER REACHES OUR MEMBERS. OUR GOAL IS TO PROVIDE ACCURATE AND AUTHORITATIVE INFORMATION, ALTHOUGH THE LRA IS NOT ENGAGED IN RENDERING LEGAL OR ACCOUNTING SERVICES. IF LEGAL OR OTHER EXPERT ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT.

PRESIDENT'S TAX PLAN SQUEAKS BY IN SENATE; NOW HEADED FOR CONFERENCE COMMITTEE

President Clinton's $500 billion tax plan, which includes a reduction in the business meal deductibility from 80% to 50%, passed the Senate on Friday, June 25. The bill passed by the slimmest of margins 50 - 49, with Vice President Gore casting the tie-breaking vote.

Senator J. Bennett Johnston voted against the bill, while Senator John Breaux voted for the tax measure. Earlier in the month LRA members held meetings with Johnston's staffers in his three Louisiana district offices in Shreveport, Baton Rouge and New Orleans. Those meetings proved to be successful as restaurateurs convinced the Senator of the ramifications the tax plan would have on the industry. LRA members made a strong case against the reduction arguing that it would cost Louisiana nearly 3,000 jobs. In addition, if restaurant sales drop and employees lose their jobs, personal income tax and business taxes paid to city and state governments will decrease as well. In Louisiana alone, business meals account for $522 million of all restaurant sales ($3.2 billion in total). The reduction of the deductibility of business meals would result in a decrease of $52 million in sales. Nationally, the reduction would mean a loss of $3.76 billion.

NRA economists also foresee fiscal woes for state and local governments as a result of the President's proposal. Currently, Louisiana has a four percent sales tax on restaurant meals. Individual cities within the state levy a second sales tax, ranging from 3 to 5 1/2 percent. A decrease in restaurant sales due to a reduction in business meals would mean a decrease in tax revenues. Faltering tax revenue would add to the state deficit and to the deficit many local governments are experiencing.

The tax bill, however, is far from being final, since the House and Senate will have to undergo lengthy negotiations to reconcile their differing versions of the legislation. According to reports from some Capitol Hill insiders, the business-meal provision has a chance of being modified during these negotiations.

BE SURE TO VISIT THE LRA BOOTH AT THIS YEAR'S EXPO

The LRA is busy gearing up for what promises to be our biggest and best Expo to date. While you're at the Expo, be sure to visit the LRA booth for complete information on all of the association's services and programs including a few exciting new programs that will be introduced at the Expo.

Education First Program - We will kick off the Education First Program at a press conference just before the opening ceremonies on Saturday, August 7. The Education First Program is a vehicle that will help create and build a partnership between the foodservice industry and youth education. If you are interested and want to know more about the program, just stop by the LRA booth. The

program materials will be available for a cost of only $10.00

Association Distributor Program - The LRA will now have the opportunity to offer our members superior educational and training materials from the Education Foundation of the National Restaurant Association at - **discounted prices!** The Association Distributor Program will drastically discount products from the Foundation's retail prices on:

- *Videos and video programs*
- *Manager Training Kits*
- *Manager Handbooks, Employee Guides and other written materials*
- *Reference books*

In addition to the aforementioned new programs, the LRA booth will contain information on all LRA services

HOW TO GET THE MOST OUT OF YOUR VISIT TO THE EXPO

The Louisiana Foodservice & Hospitality Exposition running August 7, 8 and 9 at the New Orleans Convention Center offers you a great opportunity. At the expo you will see the latest in equipment, furnishings, services and products for the hospitality industry, but...you have to have a plan of action. With so much to see and absorb, veteran show-goers suggest a smart strategy for organizing your time at the event. If you don't, you will miss the opportunity to see and learn all that you can during the three day expo. So here it is.....

The "How To See The Expo Like A Veteran" Checklist

1. Have a specific goal in mind
2. Be sure to review those exhibitors who are offering "Show Specials" and "New Products"
3. Review the floorplan of the Expo (one is available in the Show Directory)
4. Bring supplies so that you can take notes
5. Don't rush - give the exhibits the time they require
6. Do not load up with too much product literature
7. Attend the educational seminars
8. Relax and enjoy yourself

The Louisiana Foodservice & Hospitality Exposition allows you the opportunity to see what's new in your industry and make your operations more cost-effective. You can add to that appeal with a little advanced planning and a sound Expo-visit strategy.

P.S. **No children under 18 will be allowed into the show. And, wear comfortable shoes.**

It pays to Advertise in a la Carte

FOOD & DRUG ADMINISTRATION REVOKES RESTAURANT EXEMPTION ON MENU LABELING

The Food and Drug Administration (FDA) has announced it will revoke a decision by the Bush Administration to exempt restaurant menus from new food labeling laws regarding nutrient content and health claims.

The restaurant industry is very disappointed with this last-minute reversal, especially since we had hoped FDA would work with us to develop a lexicon of nutritional terms that apply to menu items yet are still compatible with the terms used on packaged retail foods. Instead, FDA is simply imposing on us regulations expressly written for standardized supermarket products. FDA spent years researching the cost and effectiveness of labeling on packaged foods, and no time at all on menu-specific research. A restaurant meal can have significant variations from day to day, depending on available ingredients, and even from serving to serving. In effect, these regulations put a straightjacket on the chef.

To call a dish "reduced" or "less" under the current regulations, a restaurant would have to show that it contained 25 percent less of a nutrient or calories per 100 grams when compared to a "reference food." But there are no reference foods in restaurants. Unlike supermarkets, where a full-fat product sits on the shelf next to its reduced fat counterpart, there is no recognized standard of comparison in the restaurant industry. Chefs don't formulate an entree to have a "reduced fat" version. They will create a completely new dish from scratch.

What about the single-unit "mom and pops" that make up more than three-quarters of our industry? How are they going to calculate 25 percent less of something per 100 grams? The end result is that they will drop health claims from their menus altogether making the American consumer less able to make informed choices when eating out than before.

STATE WARNS CRAWFISH PACKERS, FINES NEXT

Four crawfish packers have received warnings from state officials that their goods had better measure up the next time they're checked. Fines of $500 per package will be levied next.

You may recall that Act 804 of 1991 gives the Commissioner of Agriculture the authority to assess civil penalties for violations of weights and standards for oysters, crawfish, shrimp and other commodities. The fine of up to $500 is not per total violation; it is per each shorted package. So 100, one-pound packages of crawfish that don't measure up could net a packer a fine of up to $50,000. Also, the department seizes the goods. This law now makes it easier to enforce the discrepancies restaurants are finding in their orders and the actual merchandise received, resulting in reduced losses to the restaurant. Act 804 was a legislative priority of the

association in 1991.

Three of the packers are located in Acadiana with the fourth being located in the New Orleans area. Three of the four violations were in Lafayette grocery stores.

The four of 18 processors' goods didn't measure up in late April when state Agriculture and Forestry department officials checked crawfish packages weighed on 47 retail locations' shelves in Southwest Louisiana. Altogether 5,215 pounds of crawfish was weighed a second time in late April, this time by the departments's Weights and Measures police. Packages containing a total 3,802 pounds measured up. The remaining 1,413 pounds, or 27 percent, didn't, according to a state report. The goods were immediately removed from the shelves.

According to Larry Michaud, state department spokesman, "Shorting has been a common problem since packing depends on water and sometimes isn't by the pound but by the number of the product instead, such as shrimp." The warning letters are to notify processors of the new enforcement. "We're not going to tolerate that kind of activity," Michaud went on to say.

If you have a shortage to report call the state department at 504/925-3780. Michaud mentioned that those who have been frustrated in the past should give the state a second chance.

NO DEDUCTIONS FOR "LOBBYING", INCLUDING ASSOCIATION DUES

Also hidden in the President's tax plan is a provision which would not allow businesses to deduct expenditures for "lobbying activities". You could not deduct expenses for travelling to Washington D.C. to discuss the plan with your Congressman. And the portion of your LRA membership dues that is expended by the association for "lobbying" -- including analyzing legislation, mailing this newsletter, as well as lobbying in Washington or Baton Rouge or your local city hall -- would be non-deductible to you. LRA would be required to inform you of the portion of dues for "lobbying" activities, and you would need to reduce your deductible expenses accordingly.

This is a power-grab, pure and simple. It's an elitist proposal which will disenfranchise business owners and consolidate power within the legislature, their staffs and bureaucrats. If you need to fight a government proposal against your business, you'll be taxed on your efforts.

SEAFOOD SURVEY TO BE CONDUCTED

Fisheries Information & Seafood Harvest Inquiry Enterprises (FISHIE) is conducting a survey for the U.S. Department of Energy to study the effects of oil and gas structures on the inshore and offshore coastal waters and fisheries in Louisiana and Texas. One phase of the study involves analyzing the

collection, distribution, and consumption patterns of saltwater seafood caught from the coastal regions of Louisiana and Texas. Surveys are being conducted of commercial/recreational fishermen, wholesalers, processors, retailers, as well as restaurants.

Upon completion of the project, the findings of the study will be made available to all those participating. Prior to the completion of the study, preliminary results will also be made available to respondents of the survey questionnaire. Restaurateurs may find the results useful, e.g. types of seafood which are most popular or the most common method of preparation. To obtain an accurate description of the seafood consumption pattern, assistance is needed from LRA members. Please take time to fill out the enclosed questionnaire.

If you have any questions on the study, please contact Mr. Fred Schultz of FISHIE at 504/831-2099

GET YOUR TICKETS EARLY

Get your tickets early for this year's **President's Grand Reception & Awards Banquet,** to be held at the Westin Canal Place on Sunday evening, August 8. It is at this banquet that the Louisiana Restaurant Association will bestow its most prestigious honors including *Restaurateur of the Year, Hall of Fame and Distinguished Service Awards, Active and Associate Members of the Year, Chapter and Chapter President of the Year.*

Put on your dancing shoes and come prepared for Na Na Sha, a 12 - piece 50s and 60s show and dance band. To make your reservations, call 504/831-7788 or 800/256-4572. Tickets are $40.00 per person or $400.00 for a table of ten, with cocktails at 6:00 p.m. and dinner starting promptly at 7:00. Black tie will be optional.

UNEMPLOYMENT COMPENSATION TAX SET TO EXPIRE....MAYBE

For the past six years, you have been paying a special unemployment compensation (UC) tax at an annual rate of 1.4 percent on the first $15,000 of wages paid to each of your employees. As you are aware, this tax is to pay off the $1 billion UC bond issue of 1987, and it will end after the second quarter of this year.

The state UC law permits the Department of Labor to adjust the taxable wage base on which the 1.4 percent rate is assessed to collect no less than an amount necessary to pay the bonds which remain outstanding. However, the Governor and Department of Labor have elected not to reduce the taxable wage base, which will result in an overcollection of the second quarter's tax by approximately $50 million.

They even introduced a bill this session to place this $50 million overcollection in a special account in order to use the interest accruing from it to fund unspecified "training and re-employment programs." With your help, we were able to stop the bill, thereby removing any

incentive the Governor and Department had for overcollecting the tax.

Unfortunately, the Department of Labor responded by expediting its mailing of the assessment notices, and you probably already received yours. However, payment of the assessment is not due until July 31, 1993, and it is still possible for the Department of Labor to mail a corrected assessment notice with an adjusted taxable wage base figure.

Letters to the Governor from you and other employers around the state stating your indignation at this unnecessary confiscation of your money could yet persuade him to change his position on overcollecting the tax. Pease write the Governor and demand that he direct the Department of Labor to correct the assessment notice to collect only an amount necessary to pay off the bonds. It is only through a strong grassroots effort of this magnitude that you have any hope of retaining your hard-earned dollars.

SIN TAX WILL RESULT IN FEWER JOBS

Louisiana will have 2,300 fewer jobs and nationally 180,000 jobs will be lost if the proposed "Sin tax" wins approval, according to David Wyss, research director for DRI/McGraw-Hill of Lexington, Mass. DRI/McGraw-Hill recently completed a study of the sin tax for the beer industry.

President Clinton has discussed the tax increase on several occasions as a possible way of financing a federal healthcare program.

The current federal tax on a six-pack of beer is 33 cents, which was doubled in 1991 from 16 cents. The latest tax boost could impose another 48 cents on a six-pack, bringing the federal tax to 81 cents. The higher tax would create annual revenue of $4.4 billion.

Beer taxes are among the most regressive of all taxes, hitting the lower- and middle-income taxpayers - those least able to pay - the hardest. The 1991 tax increase on beer cost the country an estimated 30,000 beer-industry jobs.

FIRST LRA SANITATION CERTIFICATION SUCCESSFUL; ROOM STILL AVAILABLE FOR NEXT SESSION

The LRA recently held the first class of the initial three-day sanitation course in Metairie and there's every indication that it was a resounding success. The ServSafe sanitation course that has been developed by the Educational Foundation of the National Restaurant Association was presented to 25 LRA members who learned valuable information on sanitation practices from purchasing, storing and food preparation, to service. The course is based on the *Applied Foodservice Sanitation, Fourth Edition* text.

There is still plenty of room available in the Baton Rouge classes to be held at the Ralph & Kacoo's on Bluebonnet July 14, 21 & 28 from 1 p.m. until 5 p.m. Also, the association will be holding classes in

Monroe. The classes will be held Sunday, July 18 from 1:00 p.m. until 5:00 p.m. and Monday July 19 and Tuesday July 20 either from 9:00 a.mn. until 1:00 p.m. or 2: p.m. until 6:00 p.m. To register or if you have any questions, please call Director of Education Mary Weber at 504/831-7788 or 800/256-4572.

Education and training contributes to growth of the foodservice industry as well as the personal and professional growth of the employees.

LRA CREDIT CARD ACCEPTANCE PROGRAM ANNOUNCES NEW RATES

CNET Card Acceptance Services, the official company of the LRA Credit Card Program, recently announced a new rate schedule for Louisiana. The new rates are designed with the low to mid range restaurant in mind. Effectively immediately, there is a new tier to the MasterCard/Visa rate grid. The new tier is:

- Average ticket of $0.00 to $19.99 = 2.99%

Currently the grid starts at "$15.99 to $19.99". That has been replaced by the new tier. Additionally, CNET has lowered the rate from 3.09% to 2.99%

For additional information concerning the LRA Credit Card Program, contact Eric Minshew at 504/831-7896 or stop by the CNET booth at the Louisiana Foodservice & Hospitality Expo at the New Orleans Convention Center, August 7, 8 and 9.

1993 Louisiana Foodservice & Hospitality Exposition August 7, 8 and 9 New Orleans Convention Center

CALENDAR OF SPECIAL EVENTS

AUGUST 5	9TH ANNUAL NORA GOLF TOURNAMENT, EASTOVER COUNTRY CLUB
AUGUST 7-9	40TH ANNUAL LOUISIANA FOODSERVICE & HOSPITALITY EXPOSITION, NEW ORLEANS
AUGUST 8	CULINARY CLASSIC SPRINT, MORIAL CONVENTION CENTER, NEW ORLEANS
SEPTEMBER 13-15	NRA PUBLIC AFFAIRS CONFERENCE, WASHINGTON, D.C.

ALONG THE BAYOU

***Slidell has been chosen as the site of the 1993 Dizzy Dean World Series. The series will bring over 2,000 people to the area between July 23 and July 29. The estimated economic impact on area restaurants will be approximately $225,000.

***While the President likes to point to Canada when talking about a model for the U.S. healthcare system, he might want to look there for a federal budget. The Canadian government left the business meal deductibility at 80% in its recently passed budget. In addition to the deductibility remaining at 80%, the budget contained no new taxes, no increased taxes and a reduction of costs for government programs. (Is Reagan living in the Great White North?)

***The Rotary Club of New Orleans will be presenting its 5th Annual Waiter of the Year Award this August. If you have someone you'd like to nominate, call Meg or Lloyd at the LRA office at 504/831-7788. Nominations must be received by July 23.

***Pursuant to By-Law 6, Section 1 of the By-Laws of the Louisiana Restaurant Association, please be advised of the annual meeting of the Members of the Corporation scheduled for Sunday, August 8, 1993 at 3:00 p.m. at the New Orleans Convention Center. Keynote speaker for the meeting will be Ron Magruder, president of Olive Garden Restaurants. Please show support for your association by making every effort to attend.

YOUR NEWS IS GOOD NEWS

The **ACADIANA CHAPTER** held its June meeting at Bertrand's Riverfront Restaurant in Abbeville. Legislative Committee Chairman Charlie Goodson gave a complete recap of the 1993 legislative session.

The **GREATER BATON ROUGE CHAPTER** held its June meeting at Hunan Chinese Restaurant. Davis Rhorer, Director of the Baton Rouge Downtown Development District was the guest speaker.

The **NEW ORLEANS/NORTHSHORE CHAPTERS** held a "Family Day Picnic" at Ahmeek (The Blitch family home) in Abita Springs on Sunday June 6. Over 100 members and their families enjoyed outdoor activities such as swimming, boating, tennis, volleyball and a few mean games of bacci ball. Barbecued hamburgers, hotdogs and sausage were cooked by LRA architect Ron Blitch.

The **NORTHEAST CHAPTER** held its June meeting at Red Lobster Restaurant in Monroe. Nolan Sharon of Laboratory Specialists, Inc. explained the variety of assistance available through the association and LSI to start and implement the Drugfree Workplace Program. Russ Bergeron of the Department of Immigration and Naturalization addressed the group on the federal requirements and the regulations concerning I-9 form documentation.

The **NORTHSHORE CHAPTER** held its June meeting at Zazou Cafe in Mandeville. Bill Oiler, Consultant for the Rails and Trails Conversion discussed the economic impact on St. Tammany restaurants and businesses.

The **NORTHWEST CHAPTER** held its June meeting at Kon Tiki in Shreveport. LRA EVP Jim Funk gave a recap of the 1993 Legislative Session and discussed current federal issues.

Au Revoir

PUTTIN' ON THE RITZ

AUG. 7

AUG. 8

AUG. 9

1993

New Orleans

Convention Center

DATA APPENDIX 1

Tabulated Survey Responses

Reference Figure 5.1. Frequency distribution of category fished for Louisiana recreational fishermen.

CATEGORY FISHED	NUMBER
Finfish	513
Shrimp	13
Crab	14
Oyster	2

Reference Figure 5.2. Frequency distribution of types of fishing licenses for Louisiana recreational fishermen.

TYPE OF FISHING LICENSE	NUMBER
In-State	465
Out-of-State	9
Both	30

Reference Figure 5.3. Frequency distribution of race for Louisiana recreational fishermen.

RACE	NUMBER	RACE	NUMBER
Black	32	Oriental	1
Hispanic	0	White	438
Native American	1	Other	2

Reference Figure 5.4. Frequency distribution of fishing mode for Louisiana recreational fishermen.

FISHING MODE	NUMBER
Other than Boat	42
Private Boat Inshore	408
Private Boat Offshore	193
Charter Boat	18

Reference Figure 5.5. Frequency distribution of fishing zones for Louisiana recreational fishermen.

ZONE	NUMBER	ZONE	NUMBER
I	97	VI	98
II	150	VII	3
III	133	VIII	0
IV	154	IX	0
V	86		

Reference Figure 5.6. Frequency distribution of fishing location for Louisiana recreational fishermen.

FREQUENCY OF FISHING LOCATION	NUMBER
Inshore	403
<4.8 km (3 mi) Offshore	44
4.8 to 16 km (3 to 10 mi) Offshore	77
>16 km (10 mi) Offshore	152

Reference Figure 5.7. Frequency distribution of trips in proximity to oilfield structures for Louisiana recreational fishermen.

PROXIMITY	NUMBER
<300 m (1000 ft)	262
300 m to 0.8 km (1000 ft to 0.5 mi)	82
0.8 to 1.6 km (0.5 to 1 mi)	93
> 1.6 km (1 mi)	249

Reference Figure 5.8. Average number of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
Shrimp		Black Drum	
600	1	1	31
Crab		2	16
10	1	3	13
Oyster		4	9
0	0	5	13
Amberjack		6	10
1	5	8	1
2	8	10	10
3	7	12	1
4	1	15	4
5	1	20	1
6	4	30	5
8	1	40	1
9	1	45	1
10	6	50	1
12	2	1000	1
15	1	Croaker	
17	1	1	7
20	3	2	7
21	1	3	6
25	1	4	3
28	1	5	5
40	1	6	8
50	1	8	1
200	1	10	12

Reference Figure 5.8. (continued) **Average number of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
Croaker		Flounder (continued)	
12	5	18	1
15	3	20	10
20	1	25	4
24	1	30	6
25	2	35	1
30	4	40	1
30	2	50	3
40	2	60	1
45	1	70	1
50	3	75	1
75	1	100	1
100	1	150	1
260	1	240	1
Dolphin		Grouper	
1	5	1	8
3	4	2	4
4	2	3	3
5	4	4	4
6	1	6	1
7	1	8	1
8	1	10	2
10	8	12	3
15	2	22	1
20	3	30	3
30	3	Kingfish	
48	1	1	1
50	3	2	1
60	2	3	1
100	1	4	1
200	1	10	1
Flounder		16	1
1	21	20	1
2	34	25	1
3	27	King Mackerel	
4	23	1	5
5	23	2	11
6	21	3	3
7	3	4	1
8	6	5	3
10	21	6	1
11	2	7	1
12	9	8	1
15	8	9	1

Reference Figure 5.8. (continued) **Average number of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
King Mackerel		Redfish (continued)	
10	4	70	3
12	1	75	2
14	1	80	1
15	5	100	9
20	1	108	1
30	5	150	5
40	1	200	4
50	2	250	1
85	1	300	2
100	3	400	2
120	1	Red Snapper	
150	1	1	2
Redfish		2	5
1	16	3	1
2	12	4	2
3	19	5	2
4	11	6	4
5	35	7	6
6	14	8	3
7	7	10	9
8	13	12	3
10	38	14	3
11	1	15	7
12	16	16	2
14	1	18	1
15	32	20	6
16	1	21	1
17	2	24	1
18	2	25	3
20	40	28	2
25	11	29	1
26	1	30	2
28	2	35	6
30	28	40	4
33	1	42	1
35	10	50	5
36	1	60	3
40	6	65	1
45	3	70	1
50	16	80	3
55	1	84	2
56	1	90	1
60	14	100	7

Reference Figure 5.8. (continued) **Average number of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
Red Snapper		Sheepshead (continued)	
105	2	200	1
120	1	Spanish Mackerel	
130	1	1	8
200	1	2	7
250	1	3	1
280	1	4	4
400	1	5	8
500	1	6	4
1000	1	8	1
Shark		10	11
1	11	12	4
2	10	13	1
3	5	15	7
4	2	20	1
5	3	24	1
6	1	25	2
10	3	30	1
15	1	50	1
20	3	150	1
25	13	200	1
50	2	250	1
60	1	Speckled Trout	
64	1	1	5
100	2	2	9
Sheepshead		3	7
1	16	4	7
2	22	5	8
3	17	6	3
4	4	7	2
5	5	8	6
6	7	10	17
7	1	11	2
8	2	12	12
9	2	13	1
10	18	15	17
12	6	16	4
15	5	20	24
18	1	24	1
20	5	25	18
25	2	26	1
30	1	28	1
40	1	30	23
100	1	32	1

Reference Figure 5.8. (continued) **Average number of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
Speckled Trout		Tuna (continued)	
35	7	120	1
40	8	150	1
43	2	Vermilion Snapper	
50	32	1	2
60	6	4	1
65	1	5	1
70	1	10	4
75	11	12	2
80	6	20	1
85	1	40	2
95	1	50	2
100	25	Other	
120	3	1	10
125	6	2	5
140	1	3	8
150	18	4	2
160	1	5	5
175	2	7	2
200	29	8	4
250	9	9	1
275	1	10	5
300	8	12	3
340	1	14	1
400	4	15	2
450	1	19	1
500	4	20	5
600	1	21	1
730	1	25	2
2000	1	30	3
Tuna		35	2
1	10	40	3
2	4	50	3
3	3	56	1
4	1	60	2
5	2	80	1
6	1	90	1
7	1	100	3
10	4	102	1
13	1	145	1
14	1	150	2
36	1	245	1
80	1		
100	1		

Reference Figure 5.9. **Estimates of average weight of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.**

POUNDS CAUGHT	RESPONSES	POUNDS CAUGHT	RESPONSES
Shrimp		Dolphin (continued)	
1	1	10	2
5	1	20	1
6	1	30	1
10	2	50	1
15	1	80	1
20	1	100	2
30	3	Flounder	
40	2	3	1
50	3	4	1
60	2	5	2
75	1	5	1
100	3	7	1
150	1	10	5
700	1	20	3
1000	2	28	1
2000	1	30	1
Amberjack		50	1
5	1	60	1
30	2	Grouper	
42	1	10	1
60	2	28	1
80	1	40	1
100	1	50	3
150	1	150	1
200	3	Kingfish	
300	1	150	1
400	1	King Mackerel	
600	1	20	1
Black Drum		25	1
10	2	30	1
20	1	35	1
25	2	100	2
40	1	125	1
50	1	150	1
100	2	200	1
Croaker		Redfish	
2	1	4	1
3	1	10	2
4	1	12	1
10	3	15	1
30	1	20	1
Dolphin		25	1
7	1	30	2

Reference Figure 5.9. (continued) **Estimates of average weight of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.**

POUNDS CAUGHT	RESPONSES	POUNDS CAUGHT	RESPONSES
40	1	Spanish Mackerel	
43	1	2	1
45	1	7	1
50	4	10	1
60	1	15	1
75	1	20	2
100	6	40	1
150	1	50	2
200	2	100	1
300	2	Speckled Trout	
Red Snapper		5	2
8	2	10	1
13	1	20	3
15	1	50	1
30	3	55	1
45	1	60	1
50	2	75	3
100	5	90	1
150	1	100	6
175	1	120	1
200	2	160	1
350	1	200	3
1000	2	251	1
8000	1	300	1
Shark		Tuna	
15	1	36	1
20	1	80	1
25	1	100	1
26	1	400	2
50	2	Vermilion Snapper	
60	1	3	1
75	1	10	1
100	2	20	3
Sheepshead		Other	
2	1	30	1
5	1	47	1
10	1	60	3
20	1	65	1
25	1	70	1
30	1	87	1
100	3	100	1
120	1	129	1
		300	1
		350	1

Reference Figure 5.9. (continued) **Estimates of average weight of shellfish and finfish species caught by Louisiana recreational fishermen over a six month period.**

POUNDS CAUGHT	RESPONSES	POUNDS CAUGHT	RESPONSES
400	1		
500	2		
2000	1		

Reference Figure 5.10. **Average percentage of shellfish and finfish species kept for personal use by Louisiana recreational fishermen.**

NUMBER KEPT	RESPONSES	NUMBER KEPT	RESPONSES
Shrimp		Croaker (continued)	
10	1	20	1
20	1	25	2
30	1	30	1
33	1	50	4
50	1	60	1
75	1	90	1
100	21	100	62
Crab		Dolphin	
50	1	25	2
100	16	50	7
Oyster		70	1
0	0	90	1
Amberjack		100	36
0	4	Flounder	
10	1	0	7
20	2	10	5
25	1	15	1
35	1	20	2
50	8	25	2
75	1	30	1
90	2	50	15
100	40	60	1
Black Drum		70	1
0	7	75	2
5	1	80	3
20	1	90	2
25	2	100	183
50	8	Grouper	
70	1	0	2
90	4	5	1
100	94	10	1
Croaker		25	1
0	7	35	1
5	1	50	4
10	2	60	1

Reference Figure 5.10. (continued) **Average percentage of shellfish and finfish species kept for personal use by Louisiana recreational fishermen.**

NUMBER KEPT	RESPONSES
70	1
90	1
100	24
Kingfish	
50	1
100	8
King Mackerel	
0	3
20	2
25	1
35	1
50	11
70	2
75	1
80	1
100	34
Redfish	
0	6
5	1
10	5
20	1
25	6
30	1
40	1
50	34
60	1
70	2
75	9
80	8
90	7
100	293
Red Snapper	
0	7
5	2
10	1
20	3
25	3
35	1
50	10
60	1
70	2
75	5
80	1
90	2

NUMBER KEPT	RESPONSES
Red Snapper (continued)	
100	87
Shark	
5	1
25	1
35	1
50	5
80	1
90	1
100	38
Sheepshead	
5	1
20	1
25	2
50	8
75	2
80	1
100	98
Spanish Mackerel	
5	1
20	1
25	1
35	1
50	7
75	1
100	54
Speckled Trout	
5	3
10	3
15	1
20	5
25	7
30	2
33	1
35	1
40	1
50	37
60	2
70	2
75	7
80	5
90	9
100	259

Reference Figure 5.10. (continued) **Average percentage of shellfish and finfish species kept for personal use by Louisiana recreational fishermen.**

NUMBER KEPT	RESPONSES	NUMBER KEPT	RESPONSES
Tuna		Other	
5	1	1	1
15	1	3	1
20	1	5	1
25	1	20	4
50	8	25	1
70	1	35	1
80	1	50	6
100	21	60	1
Vermilion Snapper		75	1
5	1	90	1
25	1	100	67
50	5		
70	1		
100	10		

Reference Figure 5.11. **Percentage of finfish parts consumed by Louisiana recreational fishermen.**

FINFISH	# MEAT	# SKIN & MEAT	FINFISH	# MEAT	# SKIN & MEAT
Amberjack	61	3	Red Snapper	118	12
Black Drum	112	11	Shark	50	2
Croaker	73	12	Sheepshead	114	7
Dolphin	47	3	Spanish Mackerel	64	8
Flounder	222	30	Speckled Trout	349	36
Grouper	33	2	Tuna	38	1
Kingfish	8	0	Vermilion Snapper	20	1
King Mackerel	55	5	Other	73	4
Redfish	343	46			

Reference Figure 5.12. **Frequency distribution of cooking methods used by Louisiana recreational fishermen.**

COOKING METHOD	NUMBER	COOKING METHOD	NUMBER
Baked	268	Grilled	219
Barbecued	167	Smoked	36
Blackened	88	Stew/Soup	33
Boiled/Poached	25	Other	36
Fried	456		

Reference Figure 5.13. Frequency distribution of category fished for Texas recreational fishermen.

CATEGORY FISHED	NUMBER
Finfish	381
Shrimp	5
Crab	7
Oyster	1

Reference Figure 5.14. Frequency distribution of types of fishing licenses for Texas recreational fishermen.

TYPE OF FISHING LICENSE	NUMBER
In-State	350
Out-of-State	23
Both	3

Reference Figure 5.15. Frequency distribution of race for Texas recreational fishermen.

RACE	NUMBER	RACE	NUMBER
Black	4	Oriental	0
Hispanic	18	White	323
Native American	1	Other	0

Reference Figure 5.16. Frequency distribution of fishing mode for Texas recreational fishermen.

FISHING MODE	NUMBER
Other than Boat	39
Private Boat Inshore	213
Private Boat Offshore	199
Charter Boat	25

Reference Figure 5.17. Frequency distribution of fishing zones for Texas recreational fishermen.

ZONE	NUMBER	ZONE	NUMBER
I	2	VI	22
II	1	VII	160
III	2	VIII	165
IV	1	IX	95
V	1		

Reference Figure 5.18. **Frequency of distribution of fishing location for Texas recreational fishermen.**

FREQUENCY OF FISHING LOCATION	NUMBER
Inshore	223
<4.8 km (3 mi) Offshore	15
4.8 to 16 km (3 to 10 mi) Offshore	43
> 16 km (10 mi) Offshore	186

Reference Figure 5.19. **Frequency distribution of trips in proximity to oilfield structures for Texas recreational fishermen.**

PROXIMITY	NUMBER
<300 m (1000 ft)	188
300 m to 0.8 km (1000 ft to 0.5 mi)	82
0.8 to 1.6 km (0.5 to 1 mi)	77
> 1.6 km (1 mi)	224

Reference Figure 5.20. **Average number of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
Shrimp		Amberjack (continued)	
0	0	70	1
Crab		75	2
48	2	150	2
84	1	Black Drum	
120	1	1	13
240	1	2	3
360	1	3	2
Oyster		4	5
48	1	5	2
Amberjack		6	3
1	10	10	3
2	7	12	4
3	2	19	1
4	2	20	1
5	2	25	1
6	1	Croaker	
7	1	1	1
10	1	2	3
11	1	3	1
12	1	4	1
12	1	5	4
15	1	6	4
20	3	10	3
25	1	15	1
50	2	20	1

Reference Figure 5.20. (continued) **Average number of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
Croaker		Grouper	
30	3	1	4
40	2	3	2
90	1	4	1
100	1	5	3
Dolphin		30	1
1	10	Kingfish	
2	15	1	4
3	9	2	10
4	4	3	2
5	6	4	1
6	1	5	1
10	4	6	7
12	1	7	1
15	5	8	2
18	2	9	1
20	7	10	4
25	2	12	1
30	1	20	2
50	1	25	1
60	1	30	1
70	1	40	2
100	2	50	1
200	1	60	1
300	1	324	1
400	1	500	1
500	1	King Mackerel	
Flounder		1	4
1	12	2	7
2	16	3	6
3	12	4	6
4	5	5	5
5	7	6	9
6	14	8	2
7	5	9	1
8	3	10	6
10	10	12	1
15	4	15	2
18	1	20	2
20	9	30	1
25	2	40	3
30	1	50	3
40	3	72	1
80	1	100	1
100	2		

Reference Figure 5.20. (continued) **Average number of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
King Mackerel		Red Snapper (continued)	
250	1	17	1
500	1	20	5
Redfish		21	1
1	12	28	3
2	24	29	1
3	13	30	1
4	5	40	1
5	2	50	3
6	15	60	3
7	4	70	1
8	10	100	3
9	1	120	3
10	14	126	1
12	7	140	2
15	6	150	1
16	1	175	2
18	1	200	2
20	17	210	1
25	3	300	2
30	10	364	1
36	1	560	1
40	4	600	1
50	4	800	1
70	1	864	1
75	1	1000	2
80	2	2000	1
100	4	Shark	
150	2	1	16
350	1	2	12
Red Snapper		3	5
1	6	4	4
2	5	5	3
3	4	6	4
4	4	8	1
5	6	10	3
6	5	12	2
7	9	15	1
8	1	30	1
9	2	35	1
10	2	40	1
12	1	50	1
14	4	100	1
15	4		

Reference Figure 5.20. (continued) **Average number of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES
Sheepshead	
1	8
3	2
4	1
5	2
6	1
10	1
12	1
20	2
Spanish Mackerel	
1	6
2	2
3	1
4	3
5	2
10	4
15	1
20	1
30	1
35	1
40	1
50	1
80	1
Speckled Trout	
1	7
2	2
3	3
4	4
5	6
6	14
7	3
8	9
9	1
10	15
12	10
13	1
14	1
15	8
16	1
18	1
20	19
21	1
24	3
25	5

NUMBER CAUGHT	RESPONSES
Speckled Trout (continued)	
26	1
30	11
35	2
36	3
40	9
50	2
55	1
60	3
65	1
70	1
75	2
80	1
90	1
100	5
120	1
130	2
150	1
200	4
300	1
400	3
500	2
Tuna	
1	5
2	2
3	1
4	3
5	2
6	2
7	2
8	7
9	1
10	2
12	1
15	2
20	1
50	1
Vermilion Snapper	
1	1
2	1
3	1
6	1
10	2
20	1

Reference Figure 5.20. (continued) **Average number of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

NUMBER CAUGHT	RESPONSES	NUMBER CAUGHT	RESPONSES
Vermilion Snapper		Other (continued)	
40	1	11	2
45	1	12	1
50	1	15	3
150	1	17	1
300	1	18	1
Other		20	1
1	19	25	1
2	7	30	1
3	5	36	2
4	2	40	1
5	5	50	1
6	6	90	1
7	1	100	1
8	5	700	1
10	3	1000	1

Reference Figure 5.21. **Estimates of average weight of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

POUNDS CAUGHT	RESPONSES	POUNDS CAUGHT	RESPONSES
Shrimp		Amberjack (continued)	
2	1	2500	1
25	1	Black Drum	
30	1	5	1
1500	1	6	1
Amberjack		10	1
3	1	50	1
10	1	200	1
20	1	400	2
23	1	Croaker	
35	1	2	1
50	2	5	3
65	1	10	2
125	1	12	1
150	2	60	1
200	1	Dolphin	
250	1	1.5	1
300	1	2	1
400	1	5	2
500	1	10	5
600	1	15	1
1000	1	20	2
1100	1	30	3

Reference Figure 5.21. (continued) **Estimates of average weight of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

POUNDS CAUGHT	RESPONSES	POUNDS CAUGHT	RESPONSES
Dolphin		Kingfish (continued)	
50	3	240	1
60	3	300	1
75	1	350	1
80	1	500	1
100	2	King Mackerel	
110	1	10	1
150	1	12	1
160	1	30	1
200	3	45	1
300	1	50	2
400	1	100	3
1000	1	1000	3
Flounder		Redfish	
2	1	4	1
5	4	5	2
9	1	6	1
10	6	10	2
12	1	15	2
15	3	19	1
20	5	20	2
60	1	25	3
100	1	30	2
200	2	40	2
400	1	63	1
Grouper		100	6
10	2	120	2
20	1	150	1
30	1	200	2
50	3	300	2
100	1	400	1
200	1	Red Snapper	
Kingfish		7	1
8	1	10	2
10	1	20	3
15	1	30	1
20	1	35	1
25	1	40	1
30	2	50	3
40	1	60	1
50	1	75	1
75	1	85	1
100	3	100	4
200	1	150	3

Reference Figure 5.21. (continued) **Estimates of average weight of shellfish and finfish species caught by Texas recreational fishermen over a six month period.**

POUNDS CAUGHT	RESPONSES	POUNDS CAUGHT	RESPONSES
Red Snapper		Speckled Trout (continued)	
180	1	30	5
200	2	40	3
250	3	50	3
300	4	63	1
450	1	75	1
500	2	100	2
550	1	120	1
600	2	150	2
800	1	200	1
2500	1	400	1
17000	1	Tuna	
Shark		14	1
10	1	20	2
14	1	25	1
30	1	30	1
35	1	50	1
80	1	100	5
100	2	160	1
126	1	200	3
150	1	250	1
300	1	500	3
Sheepshead		Vermilion Snapper	
2	2	4	1
10	1	15	1
20	1	20	2
50	1	30	1
Spanish Mackerel		100	1
1	1	200	2
2	1	Other	
4	1	20	1
5	1	25	1
10	4	30	1
15	1	55	1
20	2	70	1
45	2	75	1
Speckled Trout		100	2
3	1	250	3
4	1	252	1
8	1	400	1
10	1	2100	1
15	1		
20	1		
25	1		

Reference Figure 5.22. **Average percentage of shellfish and finfish species kept for personal use by Texas recreational fishermen.**

PERCENT KEPT	RESPONSES	PERCENT KEPT	RESPONSES
Shrimp		Dolphin (continued)	
10	1	80	2
100	3	85	1
Crab		90	1
100	6	100	68
Amberjack		Flounder	
1	1	0	1
2	2	2	1
5	1	10	3
10	3	20	2
20	2	25	1
25	1	30	4
50	6	50	4
70	1	60	1
75	2	70	1
80	1	75	1
100	37	80	1
Black Drum		90	1
2	1	100	110
10	3	Grouper	
20	1	5	1
25	1	10	1
50	6	20	1
100	35	50	3
Croaker		100	13
0	2	Kingfish	
10	2	5	1
25	1	10	1
50	3	20	1
100	24	25	1
Dolphin		33	1
0	5	50	3
1	1	60	1
2	2	70	1
5	1	75	1
10	3	80	2
20	4	85	1
25	2	90	1
30	2	100	46
33	1	King Mackerel	
50	12	1	1
60	1	2	3
70	2	10	5
75	2	15	1

Reference Figure 5.22. (continued) **Average percentage of shellfish and finfish species kept for personal use by Texas recreational fishermen.**

PERCENT KEPT	RESPONSES	PERCENT KEPT	RESPONSES
King Mackerel		Sheepshead	
20	2	20	1
25	1	50	2
50	8	98	1
75	1	100	17
100	47	Spanish Mackerel	
Redfish		2	2
2	1	10	1
10	6	20	1
20	1	30	1
25	2	50	2
30	3	90	1
33	1	100	19
40	1	Speckled Trout	
50	11	2	2
60	1	10	6
70	175	20	3
75	1	25	3
80	1	30	3
90	2	33	1
100	152	40	1
Red Snapper		50	9
1	1	60	1
2	3	70	1
5	2	75	3
10	4	80	1
20	4	90	2
25	1	100	151
50	14	Tuna	
70	2	1	1
75	2	2	1
80	2	5	2
85	1	10	3
90	1	20	1
100	96	30	2
Shark		50	5
2	3	70	1
5	1	75	1
10	2	100	27
20	1	Vermilion Snapper	
50	7	2	1
75	1	10	1
85	1	20	1
100	46	50	3

Reference Figure 5.22. (continued) **Average percentage of shellfish and finfish species kept for personal use by Texas recreational fishermen.**

PERCENT KEPT	RESPONSES	PERCENT KEPT	RESPONSES
Vermilion Snapper		Other (continued)	
75	1	25	3
100	12	30	2
Other		40	1
2	2	50	3
5	1	80	1
10	2	90	1
20	2	100	66

Reference Figure 5.23. **Percentage of finfish parts consumed by Texas recreational fishermen.**

FINFISH	# MEAT	# SKIN & MEAT	FINFISH	# MEAT	# SKIN & MEAT
Amberjack	98	10	Red Snapper	112	25
Black Drum	33	10	Shark	50	13
Croaker	24	8	Sheepshead	14	5
Dolphin	90	18	Spanish Mackerel	25	7
Grouper	15	4	Speckled Trout	155	30
Kingfish	54	4	Tuna	30	10
King Mackerel	56	18	Vermilion Snapper	18	1
Redfish	141	39	Other	45	20

Reference Figure 5.24. **Frequency distribution of cooking methods used by Texas recreational fishermen.**

COOKING METHOD	NUMBER	COOKING METHOD	NUMBER
Baked	125	Fried	284
Barbecued	82	Grilled	178
Blackened	44	Smoked	28
Boiled/Poached	13	Stew/Soup	8
Broil	154	Other	15

Reference Figure 5.25. **Frequency distribution of category fished for Louisiana and Texas commercial fishermen.**

CATEGORY FISHED	NUMBER
Finfish	28
Shrimp	185
Crab	18
Oyster	9

Reference Figure 5.26. **Frequency distribution of race for Louisiana and Texas commercial fishermen.**

RACE	NUMBER	RACE	NUMBER
Black	6	Oriental	25
Hispanic	24	White	121
Native American	2	Other	9

Reference Figure 5.27. **Frequency distribution of fishing zones for Louisiana and Texas commercial fishermen.**

ZONE	NUMBER	ZONE	NUMBER
I	22	VI	41
II	37	VII	47
III	96	VIII	56
IV	77	IX	56
V	51		

Reference Figure 5.28. **Frequency distribution of fishing location for Louisiana and Texas commercial fishermen.**

FREQUENCY OF FISHING LOCATION	NUMBER
Inshore	104
<4.8 km (3 mi) Offshore	33
4.8 to 16 km (3 to 10 mi) Offshore	55
>16 km (10 mi) Offshore	73

Reference Figure 5.29. **Frequency distribution of trips in proximity to oilfield structures for Louisiana and Texas commercial fishermen.**

PROXIMITY	NUMBER
<300 m (1000 ft)	89
300 m to 0.8 km (1000 ft to 0.5 mi)	66
0.8 to 1.6 km (0.5 to 1 mi)	57
> 1.6 km (1 mi)	60

Reference Figure 5.30. **Average percentage of shellfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	SHRIMP	BLUE CRAB	OYSTER
Louisiana Wholesaler/Processor			
6.0	1		
50.0	2	2	
70.0	1		
80.0	2		
90.0	4	2	
95.0	2		

Reference Figure 5.30. (continued) **Average percentage of shellfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	SHRIMP	BLUE CRAB	OYSTER
Louisiana Wholesaler/Processor			
98.0	11	1	
98.5		1	
99.0	14		1
99.5	13	1	1
99.8	1		
99.9	12	2	
100.0	55	4	6
Texas Wholesaler/Processor			
4.5	1		
10.0	1		
50.0	2		
75.0	1		
80.0	1		
85.0	1		
90.0	1		
94.5	1		
95.0	1		
99.0	7		
99.1	1		
99.5	3		
99.9	18		
100.0	26		
Total Wholesaler/Processor			
4.5	1		
6.0	1		
10.0	1		
50.0	4	2	
70.0	1		
75.0	1		
80.0	3		
85.0	1		
90.0	5	2	
94.5	1		
95.0	3		
98.0	11	1	
98.5	1		
99.0	21		1
99.1	1		
99.5	16	1	1
99.8	1		
99.9	30	2	
100.0	81	4	6

Reference Figure 5.30. (continued) **Average percentage of shellfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	SHRIMP	BLUE CRAB	OYSTER
Louisiana Retail/Restaurant			
4.5		1	
10.0	1		
15.0	1		
20.0	1		
50.0	1		
90.0		1	
100.0			1
Texas Retail/Restaurant			
0.5	2		
10.0	1		
20.0	1		
25.0	1		
50.0	1		
88.0	1		
90.0	2		
100.0	1	1	
Total Retail/Restaurant			
0.5	2		
4.5		1	
10.0	2		
15.0	1		
20.0	2		
25.0	1		
50.0	2		
88.0	1		
90.0	2	1	
100.0	1	1	1
Louisiana Consumer			
5.0		1	
9.5	1		
10.0		1	
Texas Consumer			
10.0	1		
15.0	1		
50.0	1		
Total Consumer			
5.0		1	
9.5	1		
10.0	1	1	
15.0	1		
50.0	1		

Reference Figure 5.30. (continued) **Average percentage of shellfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	SHRIMP	BLUE CRAB	OYSTER
Louisiana Other			
0.5		1	
30.0	1		
Texas Other			
0.1	1		
100.0	2		
Total Other			
0.1	1		
0.5		1	
30.0	1		
100.0	2		
Louisiana Given Away			
0.5	1		
1.0	2		
5.0	1		
10.0	1		
50.0		1	
60.0		1	
80.0		1	
100.0		1	
Texas Given Away			
0.0			
Total Given Away			
0.5	1		
1.0	2		
5.0	1		
10.0	1		
50.0		1	
60.0		1	
80.0		1	
100.0		1	
Louisiana Kept			
0.1	12	2	
0.2	1		
0.5	16	1	1
1.0	11		1
2.0	11	1	
5.0	2		
10.0	1	1	
20.0		1	
40.0		1	
50.0	1	3	
94.0	1		
100.0		16	

Reference Figure 5.30. (continued) **Average percentage of shellfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	SHRIMP	BLUE CRAB	OYSTER
Texas Kept			
0.1	22		
0.5	5		
1.0	7		
2.0	1		
Total Kept			
0.1	34	2	
0.2	1		
0.5	21	1	1
1.0	18		1
2.0	12	1	
5.0	2		
10.0	1	1	
20.0		1	
40.0		1	
50.0	1	3	
94.0	1		
100.0		16	

Reference Figure 5.31. **Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	LOUISIANA	TEXAS	TOTAL
WHOLESALER/PROCESSOR			
Amberjack			
90.0	1		1
100.0	1		1
Black Drum			
95.0	1		1
99.0	1		1
99.9		2	2
100.0	4	1	5
Croaker			
100.0	2		2
Dolphin			
100.0	6		6
Flounder			
95.0	1		1
99.0	2		2
99.5	1		1
99.9	2	2	4
100.0	6	1	7

Reference Figure 5.31. (continued) **Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	LOUISIANA	TEXAS	TOTAL
WHOLESALER/PROCESSOR			
Grouper			
50.0	1		1
90.0	1		1
99.0	1	1	2
100.0		1	1
Kingfish			
0.0			0
King Mackerel			
100.0	4	1	5
Red Snapper			
99.0		1	1
100.0	2	1	3
Shark			
60.0	1		
99.5	1		
100.0	5	1	6
Sheepshead			
99.0	1		1
99.9		2	2
100.0	11	1	12
Spanish Mackerel			
100.0	1		1
Speckled Trout			
95.0	1		1
99.5	1		1
100.0	1		1
Tuna			
99.0	1		1
99.5	1		1
100.0	6		6
Vermilion Snapper			
90.0	1		1
100.0		1	1
Other			
90.0	1		1
99.0	1		1
100.0	5		5
RETAIL/RESTAURANT			
Amberjack			
0.0			0
Black Drum			
0.0			0

Reference Figure 5.31. (continued) **Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	LOUISIANA	TEXAS	TOTAL
RETAIL/RESTAURANT			
Croaker			
0.0			0
Dolphin			
0.0			0
Flounder			
100.0		2	2
Grouper			
0.0			0
Kingfish			
0.0			0
King Mackerel			
0.0			0
Red Snapper			
0.0			0
Shark			
0.0			0
Sheepshead			
0.0			0
Spanish Mackerel			
0.0			0
Speckled Trout			
0.0			0
Tuna			
0.0			0
Vermilion Snapper			
0.0			0
Other			
0.0			0
CONSUMER			
Amberjack			
0.0			0
Black Drum			
0.0			0
Croaker			
0.0			0
Dolphin			
0.0			0
Flounder			
0.0			0
Grouper			
0.0			0
Kingfish			
0.0			0

Reference Figure 5.31. (continued) **Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	LOUISIANA	TEXAS	TOTAL
CONSUMER			
King Mackerel			
0.0			0
Shark			
0.0			0
Sheepshead			
0.0			0
Spanish Mackerel			
0.0			0
Speckled Trout			
0.0			0
Tuna			
0.0			0
Vermilion Snapper			
0.0			0
Other			
0.0			0
OTHER			
Amberjack			
0.0			0
Black Drum			
0.0			0
Croaker			
100.0		1	1
Dolphin			
0.0			0
Flounder			
0.0			0
Grouper			
0.0			0
Kingfish			
0.0			0
King Mackerel			
0.0			0
Red Snapper			
0.0			0
Shark			
0.0			0
Sheepshead			
0.0			0
Spanish Mackerel			
0.0			0
Speckled Trout			
0.0			0

Reference Figure 5.31. (continued) **Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	LOUISIANA	TEXAS	TOTAL
OTHER			
Tuna			
0.0			0
Vermilion Snapper			
0.0			0
Other			
0.0			0
GIVEN AWAY			
Amberjack			
10.0	1		1
Black Drum			
0.0			0
Croaker			
0.0			0
Dolphin			
0.0			0
Flounder			
0.0			0
Grouper			
0.0			0
Kingfish			
0.0			0
King Mackerel			
0.0			0
Shark			
0.0			0
Sheepshead			
0.0			0
Spanish Mackerel			
0.0			0
Speckled Trout			
100.0	1		1
Tuna			
0.0			0
Vermilion Snapper			
0.0			0
Other			
10.0	1		1
KEPT			
Amberjack			
100.0	1		1

Reference Figure 5.31. (continued) **Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	LOUISIANA	TEXAS	TOTAL
KEPT			
Black Drum			
0.1		2	2
1.0	1		1
5.0	1		1
100.0		1	1
Croaker			
100.0		1	1
Dolphin			
0.0			0
Flounder			
0.1	2	2	4
0.5	1		1
1.0	2		2
5.0	1		1
100.0	8	7	15
Grouper			
1.0	1	1	2
10.0	1		1
50.0	1		1
100.0		1	1
Kingfish			
0.0			0
King Mackerel			
100.0	1		1
Red Snapper			
1.0		1	1
100.0		3	3
Shark			
0.5	1		1
40.0	1		1
100.0		3	3
Sheepshead			
0.1		2	2
1.0	1		1
100.0	1	2	3
Spanish Mackerel			
0.0			0
Speckled Trout			
0.5	1		1
5.0	1		1
100.0	4	1	5

Reference Figure 5.31. (continued) **Average percentage of finfish distribution for Louisiana and Texas commercial fishermen.**

PERCENT	LOUISIANA	TEXAS	TOTAL
KEPT			
Tuna			
0.5	1		1
1.0	1		1
Vermilion Snapper			
10.0	1		1
Other			
1.0	1		1
100.0	4	3	7

Reference Figure 5.32. **Percentage of finfish parts consumed by Louisiana and Texas commercial fishermen.**

FINFISH	LOUISIANA	TEXAS	TOTAL
Meat Only			
Amberjack	0	0	0
Black Drum	1	3	4
Croaker	0	1	1
Dolphin	0	0	0
Flounder	8	9	17
Grouper	1	1	2
Kingfish	0	0	0
King Mackerel	0	0	0
Redfish	3	0	3
Red Snapper	0	4	4
Shark	3	3	6
Sheepshead	1	4	5
Spanish Mackerel	0	0	0
Speckled Trout	6	1	7
Tuna	1	0	1
Vermilion Snapper	0	0	0
Other	1	2	3
Skin & Meat			
Amberjack	1	0	1
Black Drum	2	0	2
Croaker	0	0	0
Dolphin	0	0	0
Flounder	5	2	7
Grouper	2	0	2
Kingfish	0	0	0
King Mackerel	1	0	1
Redfish	0	0	0
Red Snapper	0	0	0
Shark	0	0	0

Reference Figure 5.32. (continued) **Percentage of finfish parts consumed by Louisiana and Texas commercial fishermen.**

FINFISH	LOUISIANA	TEXAS	TOTAL
Skin & Meat			
Sheepshead	1	0	1
Spanish Mackerel	0	0	0
Speckled Trout	1	0	1
Tuna	1	0	1
Vermilion Snapper	0	0	0
Other	1	0	1

Reference Figure 5.33. **Frequency distribution of cooking methods used by Louisiana and Texas commercial fishermen.**

COOKING METHOD	LOUISIANA	TEXAS	TOTAL
Baked	32	11	43
Barbecued	26	7	33
Blackened	15	2	17
Boiled/Poached	89	28	117
Broiled	42	15	57
Fried	135	58	193
Grilled	41	10	51
Smoked	8	2	10
Stew/Soup	56	14	70
Other	64	6	70

Reference Figure 5.34. **Frequency distribution of race for Louisiana oystermen.**

RACE	NUMBER	RACE	NUMBER
Black	0	Oriental	0
Hispanic	1	White	10
Native American	0	Other	0

Reference Figure 5.35. **Frequency distribution of fishing zones used by Louisiana oystermen.**

ZONE	NUMBER	ZONE	NUMBER
I	15	VI	0
II	0	VII	0
III	2	VIII	0
IV	2	IX	0
V	0		

Reference Figure 5.36. Frequency distribution of fishing location for Louisiana oystermen.

FREQUENCY OF FISHING LOCATION	NUMBER
Inshore	16
<4.8 km (3 mi) Offshore	0
4.8 to 16 km (3 to 10 mi) Offshore	1

Reference Figure 5.37. Frequency distribution of trips in proximity to oilfield structures for Louisiana oystermen.

PROXIMITY	NUMBER
<300 m (1000 ft)	8
300 m to 0.8 km (1000 ft to 0.5 mi)	8
0.8 to 1.6 km (0.5 to 1 mi)	6
> 1.6 km (1 mi)	5

Reference Figure 5.38. Frequency distribution of methods of cooking oysters for consumption by Louisiana oystermen.

COOKING METHOD	NUMBER	COOKING METHOD	NUMBER
Raw	15	Fried	16
Baked	0	Grilled	1
Barbecued	0	Smoked	0
Blackened	0	Stew/Soup	14
Boiled/Poached	2	Other	5
Broiled	1		

Reference Figure 5.39. Frequency distribution of race for Texas oystermen.

RACE	NUMBER	RACE	NUMBER
Black	2	Oriental	0
Hispanic	9	White	2
Native American	2	Other	0

Reference Figure 5.40. Frequency distribution of fishing zones used by Texas oystermen.

ZONE	NUMBER	ZONE	NUMBER
I	0	VI	0
II	1	VII	16
III	1	VIII	0
IV	0	IX	0
V	0		

Reference Figure 5.41. Frequency distribution of trips in proximity to oilfield structures for Texas oystermen.

PROXIMITY	NUMBER
<300 m (1000 ft)	1
300 m to 0.8 km (1000 ft to 0.5 mi)	0
0.8 to 1.6 km (0.5 to 1 mi)	7
> 1.6 km (1 mi)	11

Reference Figure 5.42. Frequency distribution of methods of cooking oysters for consumption by Texas oystermen.

COOKING METHOD	NUMBER	COOKING METHOD	NUMBER
Raw	13	Fried	15
Baked	1	Grilled	1
Barbecued	1	Smoked	0
Blackened	0	Stew/Soup	7
Boiled/Poached	2	Other	2
Broiled	0		

Reference Figure 5.43. Frequency distribution of sources of seafood for Louisiana wholesalers/processors.

PERCENT	FINFISH	SHRIMP	OYSTER	BLUE CRAB
In-State Commercial				
10	1	1	2	
25	1			
32		1		
50				1
65		1		
70	1	3		
75			2	
80		2		1
90	1			1
95		2		
100	9	14	7	12
In-State Wholesalers				
5		1		
10		3	1	
20				1
25	2		1	
30	1	3	1	
35		1		
50	1	1		1
60	1			
68		1		
70		2		
75		1		

Reference Figure 5.43. (continued) **Frequency distribution of sources of seafood for Louisiana wholesalers/processors.**

PERCENT	FINFISH	SHRIMP	OYSTER	BLUE CRAB
In-State Wholesalers				
80	1			
90		2	1	2
99			1	
100	3	3	4	2
In-State Processors				
3				1
5			1	
10		1		
20		1		
40	1			
42	1			
43	1			
60			1	
80		1		
90		1		
92				1
100		3	5	2
Out-of-State				
1			1	
5		2		
7	1			1
8				1
10	2	2	1	2
15		1		
20	1			
25		1	1	
30	1	1		
40	1			
50		1		
52		1		
60		1		
75	1			
90		1	1	
100	1	1	1	
Out-of-Country				
5		1		
6		1		
10	1			
30	1			
50	1			
100		1	1	1

Reference Figure 5.44. Average percentage of suppliers' fishing location for Louisiana wholesalers/processors.

PERCENT	RESPONSES	PERCENT	RESPONSES
Inshore		Inshore-Near Platform (continued)	
5	1	90	1
15	1	100	5
20	1	Offshore	
30	2	5	1
50	2	10	1
70	3	25	2
75	3	30	3
90	2	50	3
95	1	70	2
98	1	80	1
100	17	85	1
Inshore-Near Platform		95	1
5	1	100	6
10	2	Offshore-Near Platform	
15	1	20	1
20	2	25	1
30	3	50	4
50	2	60	1
60	1	80	1
70	1	95	1
75	2	100	6
80	1		

Reference Figure 5.45. Frequency distribution of suppliers' fishing zones for Louisiana wholesalers/processors.

ZONE	NUMBER	ZONE	NUMBER
I	6	VI	18
II	12	VII	10
III	13	VIII	7
IV	61	IX	2
V	15		

Reference Figure 5.46. Frequency distribution of shellfish destinations from Louisiana wholesalers/processors.

PERCENT	WHOLESALER/ DEALER	PROCESSING PLANT	RETAILER/ RESTAURANT	OTHER	OUT-OF-STATE
Shrimp					
1	1				1
3	1				
5	2		3	1	
8					1

Reference Figure 5.46. (continued) **Frequency distribution of shellfish destinations from Louisiana wholesalers/processors.**

PERCENT	WHOLESALER/ DEALER	PROCESSING PLANT	RETAILER/ RESTAURANT	OTHER	OUT-OF-STATE
Shrimp					
10		1	4	1	2
15	1				
20	1		1	1	
25		1		1	
30			1		1
35	1				
40					1
50	2		1		1
60		2			1
70		1			2
75	1		1		1
79					1
80	1				1
90	1	1	1		
92			1		
95		1			1
97					1
99		1			1
100		4	7	1	2
Oyster					
.02		1			
5	1		2		1
10			1	1	1
20			1		
40	1				
60					1
75	1				
80	1				
90	1	1	2		1
95			1		
98					1
100	3	2	4		1
Blue Crab (Hard Shell)					
2					1
10		1	2	1	1
20		1	1		
30			1		
70	1				1
80	1				1
90		2	1		2
98			1		
100	1	2	3		3

Reference Figure 5.46. (continued) **Frequency distribution of shellfish destinations from Louisiana wholesalers/processors.**

PERCENT	WHOLESALER/ DEALER	PROCESSING PLANT	RETAILER/ RESTAURANT	OTHER	OUT-OF-STATE
Blue Crab (Soft Shell)					
6					1
10				1	1
20			1		
25			1		
30			1		
70	1				
75	2				
80	1				
90			2		
94			1		
100			2		
Blue Crab (Meat)					
1				1	
12					1
30	1		1		1
70	2		1		2
75	1				
88			1		
99					1
100			6		1

Reference Figure 5.47. **Frequency distribution of saltwater finfish destinations from Louisiana wholesalers/processors.**

PERCENT	WHOLESALER/ DEALER	PROCESSING PLANT	RETAILER/ RESTAURANT	OTHER	OUT-OF-STATE
Black Drum					
1					1
5	1				
9					1
20			1		
50	1	1			
80	1				
91			1		
95					1
99			1		
100		1	1		
Flounder					
7					1
10					1
20			1		
50	1	1	1		1

Reference Figure 5.47. (continued) **Frequency distribution of saltwater finfish destinations from Louisiana wholesalers/processors.**

PERCENT	WHOLESALER/ DEALER	PROCESSING PLANT	RETAILER/ RESTAURANT	OTHER	OUT-OF-STATE
Flounder					
80	1				
90	1		1		
93			1		
100		1	3		
Red Snapper					
20	1				
80					1
100	1		1		
Sheepshead					
1					1
20			1		1
29					1
30	1	1			
40	1				1
50	1		1		
60					1
71			1		
80	1		1		
99			1		
100		1			
Speckled Trout					
5					1
9					1
10	1				
30					1
70	1				
90			1		
91			1		
95			1		
100	1	1	2		
Tuna					
5	1				
6					1
20					1
40	1	1			
94			1		
5					1
100	2		1		
Vermilion Snapper					
10	1				
90					1
100	1		1		1

Reference Figure 5.48. Frequency distribution of shellfish product sold by Louisiana wholesalers/processors.

PRODUCT FORM	NUMBER	PRODUCT FORM	NUMBER
Oyster		Shrimp	
In Shell	12	Heads-On	24
Shucked	17	Heads-Off	23
Prepared	2	Peeled/Undeveined	16
Crab		Peeled/Deveined	9
Whole	17	Prepared	4
Meat	16		
Prepared	3		

Reference Figure 5.49. Frequency distribution of finfish product sold by Louisiana wholesalers/processors.

PRODUCT FORM	WHOLE	FILET WITH SKIN	FILET NO SKIN	OTHER
Black Drum	7	0	3	1
Flounder	11	0	2	1
Red Snapper	6	0	2	1
Sheepshead	6	0	3	1
Speckled Trout	9	1	5	1
Tuna	5	0	1	1
Vermilion Snapper	3	0	1	1
Other	6	0	1	1

Reference Figure 5.50. Frequency distribution of sources of seafood for Texas wholesalers/processors.

PERCENT	FINFISH	SHRIMP	OYSTER	BLUE CRAB
In-State Commercial				
10		2		
15	1			
75	1			
80	1	2		1
90		2	1	
99		1		
100	3	2	1	3
In-State Wholesalers				
1		1		
5	1			
10	1	2	1	
20	1	3		
45			1	
50		1		
80		1		1
85	1			

Reference Figure 5.50. (continued) **Frequency distribution of sources of seafood for Texas wholesalers/ processors.**

PERCENT	FINFISH	SHRIMP	OYSTER	BLUE CRAB
In-State Wholesalers				
90		1		
100	1	1	2	1
In-State Processors				
5	1	2		
10	1	1		
20				1
50		1		
70		1		
85		1		
100		1	2	1
Out-Of-State				
5	1			
10		1		
20	1			
50	1			
70		1		
85			1	
100	1			
Out-Of-Country				
5		1		
10	1	1		
30	1	1		
80	1			
100	1	1		

Reference Figure 5.51. **Average percentage of suppliers' fishing location for Texas wholesalers/ processors.**

PERCENT	RESPONSES	PERCENT	RESPONSES
Inshore		Offshore	
0.05	1	20	2
70	1	30	1
75	1	90	1
80	1	100	1
100	3	Offshore-Near Platform	
Inshore-Near Platform		5	1
0.05	1	10	1
10	2	100	2
100	1		

Reference Figure 5.52. Frequency distribution of suppliers' fishing zones for Texas wholesalers/processors.

ZONE	NUMBER	ZONE	NUMBER
I	0	VI	2
II	0	VII	20
III	0	VIII	18
IV	6	IX	12
V	0		

Reference Figure 5.53. Frequency distribution of shellfish destinations from Texas wholesalers/processors.

PERCENT	WHOLESALER/ DEALER	PROCESSING PLANT	RETAILER/ RESTAURANT	OTHER	OUT-OF-STATE
Shrimp					
5	1			2	
10	1		1		2
15	1				
16	1				
20	1		2		
25					1
50		1			1
70		1			
75	1				
80		1	2		1
85		1			
90			1		1
100	2	1	2		
Oyster					
2				1	
10			1		
25		1			
30					1
70			1		
75					1
100			1		
Blue Crab (Hard Shell)					
90				1	
100			2		
Blue Crab (Soft Shell)					
100			2		
Blue Crab (Meat)					
1				1	
80			1		
100				1	

Reference Figure 5.54. Frequency distribution of saltwater finfish destinations from Texas wholesalers/processors.

PERCENT	WHOLESALER/ DEALER	PROCESSING PLANT	RETAILER/ RESTAURANT	OTHER	OUT-OF-STATE
Black Drum					
20					1
30			1		
50			1	1	
70	1				
80	1				
100	1		1		
Flounder					
10			1		
20	1				
25				1	
40			1		
50	1				
70					1
75			1		
95			1		
100			3		
Red Snapper					
10			1		
20	1		1		
25				1	
70					1
75			1		
80	1				
95			1		
100			2		
Sheepshead					
25			1		
75				1	
95			1		
100			2		
Speckled Trout					
100			2		
Tuna					
90			1		
100			2		
Vermilion Snapper					
100			2	1	

Reference Figure 5.55. Frequency distribution of shellfish product sold by Texas wholesalers/processors.

PRODUCT FORM	NUMBER	PRODUCT FORM	NUMBER
Oyster		Shrimp	
In Shell	7	Heads-On	13
Shucked	5	Heads-Off	15
Prepared	1	Peeled/Undeveined	4
Crab		Peeled/Deveined	6
Whole	6	Prepared	2
Meat	4		
Prepared	2		

Reference Figure 5.56. Frequency distribution of finfish product sold by Texas wholesalers/processors.

PRODUCT FORM	WHOLE	FILET WITH SKIN	FILET NO SKIN	OTHER
Black Drum	5	0	3	0
Flounder	6	0	2	0
Red Snapper	5	1	1	0
Sheepshead	4	0	1	0
Speckled Trout	3	0	1	0
Tuna	2	0	1	0
Vermilion Snapper	3	0	1	0
Other	4	0	3	1

Reference Figure 5.57. Frequency distribution of shellfish product sold by Louisiana retailers.

SHELLFISH	UNCOOKED/ UNPREPARED	COOKED/ PREPARED
Crab Hard	104	95
Crab Soft	67	4
Crab Meat	54	26
Oysters Whole	44	0
Oysters Meat	115	13
Shrimp Heads-On	152	89
Shrimp Heads-Off	45	3
Shrimp Peeled	48	14

Reference Figure 5.58. Frequency distribution of finfish product sold by Louisiana retailers.

FINFISH	WHOLE SKIN	WHOLE NO SKIN	FILLET SKIN	FILLET NO SKIN	PARTS	COOKED/ PREPARED
Amberjack	2	1	1	2	0	0
Black Drum	10	0	1	3	0	0
Croaker	4	0	0	0	0	0

Reference Figure 5.58. Frequency distribution of finfish product sold by Louisiana retailers. (continued)

FINFISH	WHOLE SKIN	WHOLE NO SKIN	FILLET SKIN	FILLET NO SKIN	PARTS	COOKED/ PREPARED
Dolphin	5	0	4	5	0	0
Flounder	48	0	6	11	0	1
Grouper	3	0	1	4	0	0
Kingfish	0	0	0	0	0	0
King Mackerel	1	0	0	0	0	0
Red Snapper	24	0	11	12	0	0
Shark	2	0	2	5	0	0
Sheepshead	12	0	0	2	0	0
Spanish Mackerel	12	0	0	0	0	0
Speckled Trout	38	1	7	20	0	2
Tuna	2	0	13	9	0	0
Other	13	0	5	11	0	7

Reference Figure 5.59. Frequency distribution of shellfish product sold by Texas retailers.

SHELLFISH	UNCOOKED/ UNPREPARED	COOKED/ PREPARED
Crab Hard	54	9
Crab Soft	19	2
Crab Meat	29	16
Oysters Whole	12	0
Oysters Meat	67	36
Shrimp Heads-On	52	3
Shrimp Heads-Off	94	3
Shrimp Peeled	20	43

Reference Figure 5.60. Frequency distribution of finfish product sold by Texas retailers.

FINFISH	WHOLE SKIN	WHOLE NO SKIN	FILLET SKIN	FILLET NO SKIN	PARTS	COOKED/ PREPARED
Amberjack	1	0	0	3	0	0
Black Drum	48	0	3	5	0	7
Croaker	7	0	0	0	0	0
Dolphin	0	0	0	1	0	0
Flounder	50	0	3	8	0	3
Grouper	4	0	0	2	2	0
Kingfish	3	0	0	0	0	0
King Mackerel	0	0	0	0	0	0
Red Snapper	44	0	11	9	1	3
Shark	3	0	2	6	0	0
Sheepshead	38	1	2	3	0	2
Spanish Mackerel	4	0	1	2	0	0
Speckled Trout	26	0	8	8	0	13

Reference Figure 5.60. Frequency distribution of finfish product sold by Texas retailers. (continued)

FINFISH	WHOLE SKIN	WHOLE NO SKIN	FILLET SKIN	FILLET NO SKIN	PARTS	COOKED/ PREPARED
Tuna	4	0	3	4	3	0
Other	19	0	0	1	0	3

Reference Figure 5.61. Average percentage of types of seafood dishes served in 1992 by Louisiana restaurants.

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Shellfish		Finfish (continued)	
10	4	48	1
15	2	50	16
16	1	60	2
20	2	65	1
25	4	70	2
30	8	75	1
35	2	80	1
36	1	82	1
40	4	85	2
44	1	90	2
48	1	100	3
50	11	Both	
55	1	2	2
60	10	5	4
70	5	6	1
75	1	10	6
80	3	15	2
90	1	16	1
100	4	20	6
Finfish		25	2
1	1	29	1
10	3	30	2
15	1	40	1
20	3	45	1
25	5	50	2
30	9	59	1
35	1	75	1
38	1	80	2
40	7	100	2
45	2		

Reference Figure 5.62. Average percentage of shellfish dishes served per week in 1992 by Louisiana restaurants.

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Blue Crab - Soft Shell		Oyster - Meat (continued)	
1	2	20	8
3	1	21	1
4	1	23	2
5	6	25	4
8	2	30	4
10	16	35	1
15	1	40	1
20	6	50	2
25	1	Shrimp	
38	1	5	1
80	1	10	1
Blue Crab - Other		15	2
2	2	20	2
5	5	25	4
8	2	30	9
10	6	35	3
15	1	40	8
20	5	45	1
30	5	46	1
40	3	50	12
45	1	60	4
50	4	70	5
Oyster - Half Shell		75	2
2	3	80	5
3	1	82	1
4	2	90	2
5	5	95	1
10	4	97	1
15	1	100	5
20	1	Other	
30	2	1	1
50	1	2	1
95	1	5	3
Oyster - Meat		8	2
1	1	9	1
3	2	10	5
4	1	12	2
5	3	15	2
6	1	17	1
8	2	20	6
10	11	25	1
15	3	28	1
18	1	30	2

Reference Figure 5.62. (continued) **Average percentage of shellfish dishes served per week in 1992 by Louisiana restaurants.**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Other			
35	2		
40	2		
45	1		
50	1		
62	1		
65	1		

Reference Figure 5.63. **Average percentage of finfish dishes served per week in 1992 by Louisiana restaurants.**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Amberjack		Flounder (continued)	
0.5	1	2	2
2	1	3	1
5	5	5	3
10	6	10	6
15	3	15	3
20	2	20	4
30	1	30	1
Black Drum		40	3
1	1	50	1
2	2	54	1
10	6	Grouper	
15	2	1	1
20	2	3	1
25	1	5	5
30	1	10	5
50	1	100	1
60	1	Kingfish	
Croaker		0	0
1	1	King Mackerel	
Dolphin		2	1
3	1	Red Fish	
5	6	5	2
10	4	8	1
15	2	10	4
20	3	15	1
25	1	25	1
30	3	40	1
Flounder		Red Snapper	
0.5	1	2	1
1	1	5	9

Reference Figure 5.63. (continued) **Average percentage of finfish dishes served per week in 1992 by Louisiana restaurants.**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Red Snapper		Speckled Trout (continued)	
8	1	60	1
10	6	70	1
15	5	Tuna	
20	6	2	1
25	1	5	4
30	4	10	7
40	1	20	8
50	4	40	5
60	1	50	3
80	1	60	1
Shark		70	1
5	1	100	2
15	1	Vermilion Snapper	
Sheepshead		5	2
2	1	10	1
5	1	20	1
10	4	Other	
20	1	0.5	1
30	2	3	1
Spanish Mackerel		5	4
0	0	6	1
Speckled Trout		10	4
0.75	1	15	3
2	1	20	4
5	1	30	3
10	8	40	1
15	1	45	1
20	5	50	2
25	1	60	1
30	3	80	1
35	3	90	2
40	1	95	2
46	1	98	1
50	2	100	8

Reference Figure 5.64. Average number of meals served in 1992 by Louisiana restaurants which included seafood stock.

NUMBER OF MEALS	RESPONSES	NUMBER OF MEALS	RESPONSES
Shellfish Stock		Finfish Stock	
1	3	1	1
2	1	5	1
10	3	10	3
15	1	15	2
20	6	20	1
30	2	30	4
40	1	50	1
60	3	80	1
70	1	300	1
75	1	500	1
80	1	765	1
100	2	3000	1
150	2	Both	
200	2	5	1
300	1	10	1
400	1	15	1
500	1	20	3
600	1	30	1
900	2	40	1
1000	1	50	1
1200	1	100	1
1500	1	128	1
1530	1	200	1
3000	1	255	1
		300	2
		500	1
		800	1

Reference Figure 5.65. Frequency distribution of shellfish used in stock by Louisiana restaurants in 1992.

TYPE OF SHELLFISH	NUMBER
Blue Crab	25
Shrimp	49
Oyster	14

Reference Figure 5.66. Average percentage of sources of seafood for Louisiana restaurants in 1992.

PERCENT	RESPONSES	PERCENT	RESPONSES
Commercial Fishermen		Wholesalers/Processors (continued)	
5	1	90	7
10	4	95	2
20	2	98	2
25	1	100	41
30	1	Retailers	
40	1	2	1
50	1	5	2
70	1	10	4
75	1	15	2
80	2	20	1
Wholesalers/Processors		25	1
20	2	40	1
25	1	50	3
30	2	60	1
40	1	100	3
50	6	Other	
60	1	2	1
70	1	5	1
80	2	10	1
85	2	30	1

Reference Figure 5.67. Percentage of finfish parts served in 1992 by Louisiana restaurants.

FINFISH	MEAT ONLY	SKIN & MEAT
Amberjack	21	0
Black Drum	20	1
Croaker	1	1
Dolphin	20	1
Flounder	25	11
Grouper	16	2
Kingfish	1	0
King Mackerel	1	2
Redfish	12	2
Red Snapper	35	7
Shark	5	0
Sheepshead	12	0
Spanish Mackerel	1	0
Speckled Trout	27	7
Tuna	30	2
Vermilion Snapper	5	1
Other	124	0

Reference Figure 5.68. Percentage of finfish species used in stock by Louisiana restaurants in 1992.

FINFISH	NUMBER	FINFISH	NUMBER
Amberjack	4	Red Snapper	9
Black Drum	1	Shark	0
Croaker	0	Sheepshead	4
Dolphin	1	Spanish Mackerel	0
Flounder	4	Speckled Trout	7
Grouper	5	Tuna	3
Kingfish	0	Vermilion Snapper	0
King Mackerel	2	Other	4
Redfish	1		

Reference Figure 5.69. Frequency distribution of cooking methods of seafood served in Louisiana restaurants in 1992.

COOKING METHOD	NUMBER	COOKING METHOD	NUMBER
Baked	90	Fried	62
Barbecued	30	Grilled	51
Blackened	72	Smoked	12
Boiled/Poached	28	Stew/Soup	39
Broiled	50	Other	7

Reference Figure 5.70. Average percentage of types of seafood dishes served in 1992 by Texas restaurants..

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Shellfish		Shellfish (continued)	
1	1	95	1
2	1	98	1
5	2	99	1
10	5	100	8
12	1	Finfish	
15	1	1	1
20	2	2	1
25	2	5	2
30	4	10	2
35	1	15	3
40	4	20	4
50	5	25	3
55	1	30	4
60	6	35	1
66	1	40	5
70	1	45	2
75	2	50	8
80	3	60	2
85	3	65	1
90	2	70	1

Reference Figure 5.70. (continued) **Average percentage of types of seafood dishes served in 1992 by Texas restaurants..**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Finfish		Both	
75	1	4	1
80	2	5	3
85	1	10	4
88	1	25	4
90	2	30	3
95	1	75	1
99	1	90	1
100	2	100	3

Reference Figure 5.71. **Average percentage of shellfish dishes served per week in 1992 by Texas restaurants.**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Blue Crab - Soft Shell		Oyster - Meat (continued)	
1	1	15	4
2	2	20	2
3	3	25	2
5	6	45	1
10	4	100	1
15	2	Shrimp	
Blue Crab - Other		3	1
5	3	5	1
8	1	10	1
10	8	20	2
19	1	30	3
20	2	40	1
25	1	45	2
30	2	50	3
Oyster - Half Shell		55	1
1	1	60	8
3	1	65	1
5	2	70	5
10	3	72	1
12	1	75	4
15	3	80	6
18	1	85	2
20	4	86	1
35	1	90	3
100	1	95	5
Oyster - Meat		98	1
2	1	99	1
5	2	100	19
10	3		

Reference Figure 5.71. (continued) **Average percentage of shellfish dishes served per week in 1992 by Texas restaurants.**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Other		Other (continued)	
1	1	20	5
2	1	25	4
3	1	30	1
5	2	50	2
10	4	80	1
12	1	100	1
15	2		

Reference Figure 5.72. **Average percentage of finfish dishes served per week in 1992 by Texas restaurants.**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Amberjack		Flounder (continued)	
5	4	60	1
10	2	80	1
30	1	100	1
38	1	Grouper	
Black Drum		5	6
2	1	10	2
5	3	25	1
10	1	50	1
20	2	Kingfish	
50	1	1	1
60	1	5	1
Croaker		King Mackerel	
1	1	1	1
Dolphin		Redfish	
3	2	5	2
5	2	10	2
15	1	15	1
20	1	20	2
Flounder		30	1
1	1	Red Snapper	
2	2	2	1
5	5	3	1
10	2	5	4
15	4	10	6
20	3	15	3
22	1	19	1
25	3	20	2
30	3	25	1
35	1	30	2
40	1	35	1

Reference Figure 5.72. (continued) **Average percentage of finfish dishes served per week in 1992 by Texas restaurants.**

PERCENT SERVED	RESPONSES	PERCENT SERVED	RESPONSES
Red Snapper		Speckled Trout (continued)	
40	2	40	1
50	2	100	2
65	1	Tuna	
70	1	2	1
75	2	5	7
90	2	15	3
Shark		16	1
1	1	20	1
2	1	25	1
5	3	30	1
10	2	40	3
38	1	50	1
Sheepshead		Vermilion Snapper	
5	1	5	1
9	1	15	1
10	3	20	4
20	3	30	2
Spanish Mackerel		40	2
10	1	50	1
Speckled Trout		51	1
1	1	55	1
2	1	60	1
3	1	70	1
5	2	80	2
10	2	85	1
15	1	90	2
20	2	95	1
25	1	100	12
30	1		

Reference Figure 5.73. **Average number of meals served in 1992 by Texas restaurants which included seafood stock.**

NUMBER OF MEALS	RESPONSES	NUMBER OF MEALS	RESPONSES
Shellfish Stock		Shellfish Stock (continued)	
1	1	100	3
10	1	120	1
14	1	175	1
15	1	200	2
20	4	210	1
40	1	420	1
50	2	961	1
60	1		

Reference Figure 5.73. (continued) **Average number of meals served in 1992 by Texas restaurants which included seafood stock.**

NUMBER OF MEALS	RESPONSES	NUMBER OF MEALS	RESPONSES
Finfish Stock		Both	
5	1	1	1
8	1	10	2
14	1	20	1
40	1	30	1
50	3	75	1
100	2	100	1
175	1	200	1
192	1	300	2
200	1	325	1
2000	1	384	1
		800	1

Reference Figure 5.74. **Frequency distribution of shellfish used in stock by Texas restaurants in 1992.**

TYPE OF SHELLFISH	NUMBER
Blue Crab	10
Shrimp	36
Oyster	6

Reference Figure 5.75. **Average percentage of sources of seafood for Texas restaurants in 1992.**

PERCENT	RESPONSES	PERCENT	RESPONSES
Commercial Fishermen		Wholesalers/Processors (continued)	
5	1	95	6
10	3	99	1
20	2	100	43
50	1	Retailers	
60	2	5	3
90	1	10	2
100	1	20	2
Wholesalers/Processors		40	1
10	1	50	1
20	2	75	1
25	1	100	5
40	2	Other	
75	1	1	1
80	2	5	1
85	1	10	2
90	2	15	1
		50	1

Reference Figure 5.76. Percentage of finfish parts served in 1992 by Texas restaurants.

FINFISH	MEAT ONLY	SKIN & MEAT
Amberjack	8	2
Black Drum	56	0
Croaker	14	0
Dolphin	42	0
Flounder	154	77
Grouper	63	7
Kingfish	14	0
King Mackerel	14	0
Redfish	49	21
Red Snapper	168	70
Shark	56	7
Sheepshead	49	7
Spanish Mackerel	21	0
Speckled Trout	91	35
Tuna	133	0
Vermilion Snapper	0	0
Other	147	21

Reference Figure 5.77. Percentage of finfish species used in stock by Texas restaurants in 1992.

FINFISH	NUMBER	FINFISH	NUMBER
Amberjack	14	Red Snapper	49
Black Drum	7	Shark	7
Croaker	0	Sheepshead	7
Dolphin	7	Spanish Mackerel	0
Flounder	21	Speckled Trout	7
Grouper	7	Tuna	0
Kingfish	0	Vermilion Snapper	0
King Mackerel	0	Other	35
Redfish	7		

Reference Figure 5.78. Frequency distribution of cooking methods of seafood served in Texas restaurants in 1992.

COOKING METHOD	NUMBER	COOKING METHOD	NUMBER
Baked	203	Fried	420
Barbecued	56	Grilled	273
Blackened	175	Smoked	70
Boiled/Poached	210	Stew/Soup	217
Broiled	238	Other	70

Reference Figure 6.1. **Frequency distribution of finfish species caught in proximity to oilfield structures in the summer and fall of 1992 in Louisiana.**

SPECIES	PERCENTAGE CAUGHT < 1000 FT	PERCENTAGE CAUGHT > 1 MI
Amberjack	4.75	2.23
Black Drum	5.18	6.06
Croaker	4.06	4.79
Dolphin	3.36	2.23
Flounder	9.66	13.83
Grouper	2.59	1.28
Kingfish	0.69	0.43
King Mackerel	4.23	2.23
Redfish	16.74	22.23
Red Snapper	9.49	4.68
Shark	3.97	2.45
Sheepshead	4.06	6.81
Spanish Mackerel	5.00	3.51
Speckled Trout	16.57	20.32
Tuna	2.76	1.28
Vermilion Snapper	1.21	0.85
Other	5.69	4.79

Reference Figure 6.2. **Frequency distribution of finfish species caught in proximity to oilfield structures in the summer and fall of 1992 in Texas.**

SPECIES	PERCENTAGE CAUGHT < 1000 FT	PERCENTAGE CAUGHT > 1 MI
Amberjack	6.09	4.43
Black Drum	2.30	4.18
Croaker	2.30	2.09
Dolphin	11.23	7.63
Flounder	6.22	10.46
Grouper	1.89	1.72
Kingfish	7.58	3.08
King Mackerel	5.95	5.54
Redfish	10.15	14.51
Red Snapper	14.75	8.24
Shark	6.09	4.55
Sheepshead	0.68	1.85
Spanish Mackerel	2.98	2.83
Speckled Trout	9.47	15.25
Tuna	4.06	4.67
Vermilion Snapper	2.44	1.85
Other	5.82	7.13

Reference Figure 6.3. **Frequency distribution of finfish species caught in summer and fall of 1992 in Louisiana.**

SPECIES	SUMMER NUMBER	FALL NUMBER
Amberjack	55	7
Black Drum	63	63
Croaker	45	48
Dolphin	44	7
Flounder	121	134
Grouper	33	4
Kingfish	7	3
King Mackerel	54	8
Redfish	180	230
Red Snapper	111	23
Shark	44	12
Sheepshead	73	54
Spanish Mackerel	57	18
Speckled Trout	184	204
Tuna	30	8
Vermilion Snapper	16	4
Other	69	29

Reference Figure 6.4. **Frequency distribution of finfish species caught in summer and fall of 1992 in Texas.**

SPECIES	SUMMER NUMBER	FALL NUMBER
Amberjack	51	10
Black Drum	41	8
Croaker	25	9
Dolphin	92	20
Flounder	74	56
Grouper	20	2
Kingfish	59	5
King Mackerel	61	14
Redfish	116	76
Red Snapper	112	28
Shark	54	14
Sheepshead	15	7
Spanish Mackerel	24	14
Speckled Trout	118	75
Tuna	43	11
Vermilion Snapper	20	1
Other	71	18