

# Recreational Fishing

## In the Sounds of North Carolina:

## A Socioeconomic Analysis

Volume I



Jeffrey C. Johnson
Peter Fricke
Marcus Hepburn
James Sabella
William Still
Carl R. Hayes

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VOLUME I



by

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LIST OF TABLES

TABLE OF CONTENTS

## LIST OF FIGURES AND MAPS

## EXECUTIVE SUMMARY

The following chapters contain a large amount of information about recreational fishing and the fishermen in the upper sounds of North Carolina. The more general findings contained in this study are:

1. Most anglers who fished in state waters were North Carolina residents. Boat fishermen, in particular, tended to be residents. Non-residents concentrated in the Roanoke Island/Croatan Sound Area and on the Outer Banks.

2. Most bank fishermen lived not more than two counties from marine waters. The same was true for over half of the boat fishermen. But there was a tendency for these fishermen to travel a greater distance.

3. The costs for a fishing trip varied from area to area. Fishermen spent more money in the Roanoke Island/Croatan Sound and Outer Banks regions than other areas.

4. Two distinct bank fishing populations were identified. First, there were the local bank fishermen who frequented the Albemarle, western Pamlico and Neuse River areas. Second, there were the predominately tourist bank fishermen who fished on the Outer Banks and the Roanoke Island/Croatan Sound areas. For both groups, fishing was only one of many leisure activities participated in while in the area.

5. There were sociodemographic differences between local boat and bank-fishing populations with respect to income, education, occupation, gender and race. These differences were not as distinctive as those that occur between boat fishermen and bank fishermen of the Outer Banks and Roanoke Island areas.

6. Kinship was a dominate factor in fishing party composition. Work or occupational factors were not important considerations.

7. Fishing tended to be male dominated. There was greater female participation among bank fishing parties. Almost all parties composed of only females involved bank fishing.

8. The fish species preferred by boat fishermen are flounder, gray trout, largemouth bass, striped bass, croaker, speckled trout, spot, and bluefish. Bank fishermen sought crab, spot, croaker, flounder, bluefish, gray trout, and white perch.

9. Approximately one-third of all boat fishermen had no species preference, and one-half of the bank fishermen had no preference.

10. Over 75 percent of all boat fishing parties caught at least one fish.

11. The overall catch per unit of effort for boat fishermen was 2.07 fish per fisherman hour for the sampling periods.

12. Most of the fish caught were kept and consumed by the fishermen or given away to friends or family. Less than 2 percent of all fishermen interviewed sold some of their catch.

13. The single most important element in making a fishing trip a positive experience was "catching fish." The second most important element was relaxation. The relaxation element, in combination with being outdoors, equals or betters the importance of catching fish in determining a positive fishing trip.

These general summary statements lead to some basic conclusions about recreational fishing and fishermen. Recreational fishing in the upper sounds of North Carolina was obviously a family event that allowed relaxation. But catching fish was the most important element in making a fishing trip a positive experience. Most fishermen did not prefer specific species. Catching any species provided about the same degree of satisfaction.

Most of the boat and bank fishermen have incomes above the state median. More rural bank fishermen tended to be at or below this level. In addition, rural fishermen invested little in gear and equipment and had very few expenditures during the trip. Unsuccessful attempts were made to test hypotheses that these fishermen were engaged in artisanal fishing. It is still possible that for this group recreational fishing provided additional food for the household. Such factors should be considered in future management considerations.

With respect to the economics of fishing, we found that the areas that benefit most from fishermen expenditures are the Croatan/Roanoke Sound areas and the Outer Banks. Volume II of this report contains a detailed examination of economic demand and impact.

# CHAPTER 1
# INTRODUCTION

## Introduction

This is a report on recreational fishing in the upper sounds of eastern North Carolina. Our objectives were threefold: firstly, to understand the socio-economic characteristics of marine recreational fishing in the region; secondly, to achieve an understanding of the social organization and cultural values of participants in the recreational fisheries of the sounds; and finally, to examine the economic demand for and impact of recreational fishing in eastern North Carolina.

In this study, we interviewed 957 sport fishermen in 1981 and 1982 during their fishing trips on Albemarle, Croatan, Pamlico and Roanoke Sounds, and on the Neuse and Pamlico Rivers. Our choice of research methods were dictated by the extensive shoreline and the myriad of access points available to the recreational fishermen in this area. The sounds are shallow, with a maximum depth of 26 feet near Pamlico Point, and separated from the Atlantic Ocean by the Outer Banks, a chain of barrier islands. The salinity of the water varies with distance from the inlets and with prevailing weather.

The variety and changeability of sportfishing available to users of the sounds is such that no one need leave the area without catching fish. The nearly freshwater upper reaches of Albemarle Sound yield striped bass (rock fish), white perch and largemouth bass; the lower reaches provide croaker, spot, striped bass, white perch, flounder, speckled trout and gray trout in season. Around the inlets, Croatan Sound, Roanoke Sound and much of Pamlico Sound, recreational fishermen can find, in season, king and Spanish mackerel, bluefish, channel bass, black drum, sheepshead, flounder, striped bass, croaker, spot, gray and speckled trout, tarpon, and cobia. The Neuse and Pamlico Rivers provide fishing similar to that of the upper Albermarle.

The opportunity for recreational fishing is abundant in the sounds. In 1977, 32 percent of those persons visiting the Cape Hatteras National Seashore fished during their stay in the region, according to a survey conducted by the Heritage Conservation and Recreation Service of the U.S. Department of the Interior. In the sounds and rivers of eastern North Carolina, hook- and-line fishing from a boat is the most popular type of anlging, followed by fishing from bridges, banks, beaches and piers. Recreational fishing also includes the use of gill nets, dip nets for bait, and simple gear for flounder gigging, crabbing, clamming and oystering.

Recreational fishing, as defined in this study, is fishing for pleasure and not for monetary profit. Some anglers do sell their catches on occasion, and some charter boat operators limit the number of fish their clients can take home or sell. The balance of the catch is used to defray operating expenses and keep charter prices down. These exceptions are a gray area between commercial and recreational fishing.

The study is a multidisciplinary one involving anthropologists, an economist, a historian and a sociologist. In our collaboration, information and analysis were merged to create a holistic overview of this recreational activity. It is hoped that our findings will contribute to a better understanding by sport fishermen, local communities and businesses, and government agencies of the social and economic character of recreational fishing.

## Literature Overview

Hobson Bryan (1976) noted that a literature search uncovered only 13 studies about the scientific treatment of human behavior in marine recreational fishing. Since 1976, the number of studies completed has more than doubled, largely due to a continuing interest on the part of Sea Grant Programs in coastal and Great Lakes states and the National Marine Fisheries Service. The principal focal points of the literature are fivefold: social studies to advance theoretical and applied knowledge; economic studies of mass surveys undertaken by or for government agencies; analyses for use in management of recreational fishing and/or the fish stocks sought; and studies dealing with social and economic aspects of marine recreational fishing vis-a-vis freshwater fishing or commercial fishing activities. We will discuss each of these areas in turn.

Although no dominant theoretical perspective exist on the social systems and cultural patterns of recreational fishing, three preeminent researchers, Hobson Bryan, Robert Ditton and Irving Spaulding, contributed 12 of the articles and reports published to date on the subject.

Spaulding has approached the study of participation in marine recreational fishing from a social-psychological point of view. He focused on sportfishing as a form of tension management and on the sociocultural values of marine recreational fishing. Spaulding's study is based on a study of 135 boat-using sportfishermen in Rhode Island in 1968. His findings show that within the values placed on fishing, there is a systematization which aligns with the fishing activity. Thus, values of action, e.g., tension management, catching fish and variety of experiences, account for about 60 percent of the fishermen's responses. Values that emphasize relationships, i.e. interpersonal activities, involvement with the environment and aesthetic aspects of the environment, account for nearly one third of the responses. Less than 10 percent of the responses indicate values that are personally integrative for the individual responding. In summary, Spaulding's work shows that marine recreational fishing to be a tension management activity in the lives of the fisherman and to be truly recreational.

Unlike Spaulding who utilized a single data set and a theoretical focus, Bryan examined freshwater bass fishing (1974), spring-stream fly-fishing (1974), the sociology of fishing (1976), management of conflict between sportsmen with diverse preferences (1979), and managing recreational fisheries conflicts (1982). Specializing in the sociology of recreation, Bryan developed a critical view of the social functions of recreational activities. In particular, he is critical of a lack of "explicitly formulated conceptual frameworks" (1976; p. 91) guiding research into marine recreational fisheries. In Bryan's view, discontinuities in data bases and a lack of generalization of information into typologies hampered the development of sociological inquiry.

In later writings (1976, 1979, and 1982), Bryan developed the concept of specialization as a theoretical and applied test for describing different subsets of recreational fishermen. Bryan argues that each subset has different motivations and a different level of commitment and, in consequence, can not be treated effectively as part of a homogenous mass of recreational fishermen. He puts forward four propositions to support his case:

1. Recreationists tend to go through a predictable syndrome of experiences, usually moving into more specialized stages over time.

2. The most specialized recreationists have in effect joined leisure social worlds - groups of fellow sportsmen holding similar attitudes, beliefs and ideologies, engaging in similar behavior, and having a sense of group identification. Leisure social worlds serve as major reference groups for their members and, as cohesive groups, they are effective in propounding the values of the so-called minority recreationists.

3. As level of specialization increases, attitudes and values about a particular sport change. Focus generally shifts from consumption of a resource to preservation and emphasis on the nature and setting of the activity.

4. The values attendant to specialization are inextricably linked to the properties of the resource on which the sport is practiced" (1982; p. 19).

Bryan argues that these distinctions are important in sociological terms and in the management of recreational fisheries. For the manager, information on and understanding of his constituencies and their needs and expectations can enable him to practice good resource management. Bryan defines good resource management as "giving people what they want to the extent that the ecosystem can support it, substituting settings and activities for those who will tolerate it when there is a resource shortage, and offering a logical and consistent management rationale that the public can appreciate and understand" (1982; p. 22).

The work of Sea Grant investigators at Texas A and M University, led by Robert B. Ditton, has contributed greatly to social science literature on marine recreational fishing. The focus of the Texas studies has been to complete, piece by piece, a socio-economic portrait of marine recreational fishermen --- their values, preferences and attitudes --- in relation to fishing for particular species (using different platforms). Ditton stated the philosophy of the approach:

> It is as unrealistic to believe that one or two broad national or regional fishing surveys will yield answers to all our questions in this area -- man's impact on use of fishery resources -- as it is to believe that one or two national or regional stock assessment studies will be effective. Like knowledge building in all natural resources management fields, we need to encourage more focused and better conceived survey efforts so as to understand the variability in fishing on a species -- or station -- basis....[The National Park Service and the U.S. Forest Service] have focused their research (social science as well as natural science) on an area by area basis the better to study their users in greater depth. Later, as findings are analyzed and methods are improved, findings between areas can be compared and generalizations can be made. Learning about peoples' use of leisure requires that we use a building block approach to develop knowledge instead of relying on an all-purpose one-time sirvey (1977; pp. 34-35).

Ditton and his colleagues, Jarman, Graefe, Goodale, Johnsen, Fedler, Schwartz, Auyong, Holland, and Lapotka examined charter boat fishing, the use of artificial reefs, red and black drum fisheries, the use of offshore oil and gas structures by recreational fishermen, and economic impacts of recreational boat fishing in the Houston-Galveston area. In developing these case-specific descriptive studies, the Texas group built a conceptual framework that can be applied to other fisheries. Thus, Ditton (1980a) examined striped bass fishing from an economic and social perspective, and found "no studies particular to striped bass fishing that allowed us to understand better the relationships between particular social, demographic, and economic variables, and with participation in striped bass fishing" (1980a; p. 69).

In seeking the "attainment of predictive understandings of the nature and extent of sportfishing behavior and related expenditures in the Texas coastal zone" (Ditton,1980b; p. 4), the Texas group provided information useful to fishery managers in their understanding of social and economic factors involved in recreational fishing. Graefe (1981) addressed the problem of the development of theoretical social science approaches to the study of marine recreational fishing, when he noted that classification of fishermen was a complex matter that could not be done with a single study. He argued that: "The task remains for social scientists to extend (studies of fishermen) develop meaningful ways of identifying and explaining the rich diversity present among sportsmen" (1981; p. 70). However, the Texas group explored the concept of avidity and the typology of specialization advanced by Bryan (1979). Ditton (1980a) and Graefe (1981) demonstrated

that Bryan's constructs were more effective in identifying diverse subgroups in comparisons of socioeconomic characteristics of marine recreational fishermen and their reasons for participating in the activity than traditional examinations of the sociodemographics of recreational fishermen expressing a preference for catching a particular species of fish.

Other discussions of the social aspects of recreational fishing included the work of Bertrand and Hoover (1973), Speir (1978), Burch (1976), Maiolo (1981) and Cicin-Sain (1982). Speir is a resource biologist and his study of the small-boat recreational fisherman on the Chesapeake Bay assessed fishing effort, catch, success (catch per unit of effort) and trip expenditures for use in fishery management efforts. Speir examined issues of spatial "crowding" of boat fishermen, [the use of certificates or citations to reward a fisherman for taking a record size fish or a fish meeting minimum size requirements], and the economic costs and benefits to anglers. Noting that sport fishing constitutes 40 percent of the boating activity on the Chesapeake Bay, only 25 percent of the complaints about fishing trip characteristics received by Speir related to visual or social detractions from the fishing experience. This finding indicated that, in spite of severe crowding and overfishing that resulted in small or no fish caught during trips, "the excitement of catching and the catch itself were primary objectives, and that aesthetic and contemplative aspects of fishing were secondary" (1978; p. 59). He also noted that 75 percent of recreational fishermen interviewed (N=11,000) were from the four highly urbanized counties. This raised the question of the levels of crowding acceptable to urban/surburban dwellers and to rural residents.

Burch (1976) examined the social aspects of allocation of fishery resources and concluded at least four social mechanisms operate to make allocations legitimate in the eyes of the resource user: market forces, traditional practices of allocation, regulations based on scientific evidence and legislation. Maiolo (1981) and Cicin-Sain (1982) viewed conflict over marine resources as an issue best resolved at the level of policy-maker and not resource managers. Maiolo (1981) also pointed out that competition and/or conflict may be viewed as normal since it is rooted in social "ideology of competition in the pursuit of social and economic gain" (1981; p. 91). The study by Bertrand and Hoover of the Toledo Bend reservoir in 1973 is of interest because of its holistic approach to descriptors of user characteristics, patterns and preferences. This study concluded that the principal users of the reservoir were from middle income occupational groups with a certain degree of affluence and a certain sophistication in terms of outdoor recreation (1973; p. 38). Urban residents were proportionately over-represented, but the childhood residence of 50 percent of the respondents was in rural settings. Finally, the modal size of parties was two persons, but the median party size was four people. Although males were predominant in the fishing parties, 41 percent of all users were females.

We can summarize the literature in sociology and anthropology relating to marine recreational fishing at this point in time as emergent. The principal focus has been on descriptive studies of marine recreational fishermen and their characteristics. Bryan (1982) determined that marine

recreational fishermen are not necessarily distinct in their attitudes and characteristics from other wildlife recreational users, particularly freshwater fishermen and that a review of the more extensive work in these areas would be useful for comparative purposes. A second area of focus has been on the applied nature of the research; this occurred because funding agencies were seeking solutions to resource management problems. Thirdly the research reviewed showed no common agreement concerning theoretical approaches, although the typology of specialization proposed by Bryan is attracting much attention from other researchers.

This study provides social and economic data on marine recreational fishermen in the upper sounds of North Carolina. The analysis of this data touches upon some of the issues discussed above. The primary purpose of this report, however, is to provide basic social and economic information on recreational fishermen. A second volume in this series will provide a more detailed economic analysis.

# Chapter 2
# SAMPLE DESIGN

## Marine Waters Sample Design 1981-1982

### Initial Site Selection

The sheer length of shoreline in the upper sounds and the approximate 2,500 square miles of water in the research area dictated the use of an unequal random sample scheme. Unlike some recreational studies where the sampling area could be approached in a linear fashion (e.g., beach usage or river usage), the upper sounds of North Carolina are characterized by a highly variable shoreline broken by numerous bays, creeks, estuaries, rivers and swamps (see Chapter Three: The Physical Setting). Despite these physiographic features, the undeveloped nature of much of the research area strictly delimited the number of actual access points to fishable waters.

### Site Selection

Since fishing pressures differed throughout the research area according to known seasonal fluctuations in the availability of sport species, a stratified research technique was used to allocate research effort. Initially, a series of research sites were selected for review. The prime consideration in the selection process was uniform distribution (i.e., access) to all fishable waters in the research area. At this stage, the sites chosen for review were neither selected on the basis of overall size nor the amount of fishing pressure. The initial list was drawn up from informed sources and from information contained in the 1981 North Carolina Fishing Guide. The decision was made to focus effort on marin fishing activities. This was defined as those not requiring a N.C. freshwater fishing license.

### Site Evaluation

The basic sampling model used for the study was developed by the Institute for Statistical Research, North Carolina State University, in cooperation with project personnel. The model had been used previously in marine survey work in North Carolina and the southeastern United States.

Following the model, a weighting procedure was used. The procedure utilized a variety of informed sources to determine without analysis the presumed fishing pressure from each site. Fishing pressure, at this stage, was defined as the number of fishing parties fishing from that location. For ramps this meant the number of boats launched; for marinas, the number of boats leaving on fishing trips. For piers and bridges this was defined as the number of people fishing from the location divided by 2.5. In the last instance, the divider was used to represent the number of parties fishing rather than the total number of fishermen. Fractions were rounded off.

The sources used and procedure used were as follows:

1. Area Law Enforcement Supervisors, N.C. Department of Natural Resources, Division of Marine Fisheries

   The supervisors averaged almost twenty years of involvement in the marine fisheries of the upper sound. The supervisors were presented lists of sites in their respective area and asked to respond as to the average pressure on a weekend day, with Saturday taken as the example. Although all responded that the averaging would be misleading because pressure varied throughout the season, responses were geared to average numbers over the season. Differentials in weekday pressures were also noted.

2. Marina Owners/Operators

   Where applicable, marina owners or operators were interviewed about probable pressure, and seasonal and species fluctuations.

3. On-Site Observations

   On-site observations were made at all access points initially chosen for review. In some instances, access points were deleted from the research list. The primary reasons for these deletions were: changes in site conditions such as shoaling that made launching impossible, the closure of commercially run ramps, or changes in road conditions that made access to the sites very difficult or impossible. Observation data as to present use, i.e., number of vehicles, etc., was recorded but not included in the evaluation.

## Index Values and Weighting

Once these site evaluations were completed, an index value was assigned to each access point. This index value was determined by averaging the number of parties recorded (by the informed sources) for each site. This value was assumed to reflect both the average number (fishing party pressure) and the relative use of one site to another. These ratings were then used to determine the initial allocation of effort to be given to each site. The procedure by which this was done is described below.

Prior to the beginning of sampling, the index values were summed. The percentage of the total index value for each access point index value was then computed.

$$\frac{\text{ACCESS POINT INDEX VALUE}}{\text{TOTAL OF ACCESS POINT INDEX VALUES}}$$

The index value ranges (percentages) for each site were then randomly assigned consecutive number ranges on a list from 000 to 999. A random number table was used to assign interviewers to access points. In other words, there was a greater probability of sampling at access points with higher index values than at access points with a low index value.

This sampling methodology optimized potential fishing party contact by interviewers. However, the drawback was that an equal level of sampling effort was not expended each year for each site or for each research area since the methodology was sensitive to relative fishing pressure throughout the research area.

## Selection of Interview Days and Sites

Interviewer sampled 28 days during the research period. Since prior research had indicated differentials in boating and recreational fishing usage between weekdays and weekends, the days of the month were divided accordingly. Seventy percent of the sampling took place on weekends and thirty percent on weekdays. A random numbers table determined which days interviews were to take place. This was done by taking the number of days (either weekdays, weekend days or holidays) and dividing this into 1,000. Number ranges were then assigned to each day for each group, and the tables were used to determine which days would be sampled. After the interview days were chosen, 28 sites were selected according to the procedure outlined above and assigned to the dates as they occurred during the month.

This procedure was performed approximately two weeks prior to the beginning of a month. Interviewers were then assigned interview sites, and a monthly schedule was drawn up and distributed to the interviewing team. At this point, some changes were made in assignments of individual interviewers depending on their availability.

In 1981, four to six additional interview days were randomly selected for recreational bank fishing for each month. Bank access points or areas were then nonrandomly assigned to these days. These sites were comprised of specific bank fishing access points (e.g., bridges) or specific areas of shoreline. This sampling was discontinued for 1982. Bank access points that appeared on the initial site list (two in number) remained on that list and continued to be sampled for 1982.

## Team Training

Field interviewing was conducted by a team comprised of students at East Carolina University and project staff personnel. Following development of the interview schedule, student team members were selected and trained. Training covered proper interviewing techniques, field deportment and creel (fish) identification. Training occurred prior to the beginning of the 1981 and 1982 field study. To ensure comparability of data definition and consistency, a field manual was developed and provided to each interviewer that detailed the coding regimen for each item on the schedule.

## Field Interviewing

An intercept method was used to administer the interview schedules. Research team members were assigned to access points. For recreational boat fishermen, the leader or organizer of the fishing party or owner of the boat was approached as the group returned from their trip, and permission was asked for the interview. For bank fishermen, potential respondents were approached during fishing. For the latter group this presented certain problems in accurately assessing catch-effort. (See following section on statistical analysis of research results.)

Interviewing that began in early April of 1981 focused on the river striped bass fishery. In early May, interviewing was extended to the sound areas. River surveying was terminated in mid-May, 1981. Interviewing in the sound areas was terminated in mid-November of 1981. In 1982, interviewing began in mid-April in the sound areas. No interviewing in 1982 was carried out in the nonmarine waters. Interviewing effort continued through the year and was terminated at the end of October, 1982.

After the interview day, completed schedules were returned to project offices by the interviewers and were checked by office personnel.

## Data Collection Instrument

The primary data collection instrument for the project was an interview schedule (see Appendix A). The schedule was designed by the research team. In developing the schedule, three factors were taken into consideration.

First, the sound recreational fishing was viewed as a complementary project to 1979 Sea Grant study on offshore recreational fishing. Therefore, care was taken to ensure comparability of data between the two projects. While the information collected for the sound study remained essentially the same as in the prior project, the experience and knowledge gained from the offshore work permitted the adjustment of items where necessary and when dictated by the results of the offshore work.

The second area of consideration during the development of the interview schedule was the integration of a striped bass recreational fishery interview schedule in use in a multi-state research effort. The striped bass fishery in North Carolina was taken as a case study of a species-specific fishery, and the research effort was coordinated with the larger Striped Bass Research Project directed through the University of Maryland. To focus on the N.C. striped bass fishery, researchers added striped bass-specific items to the interview schedule for both years of this study and an intensive sampling of the striped bass recreational fishery on the Tar and Roanoke Rivers during the early interviewing phase in 1981.

The third area under consideration in the development of the schedule stemmed from an investigation of the theoretical issues in the literature of the sociology and economics of leisure, with particular emphasis on outdoor recreation and fishing as a leisure activity as outlined in chapter one of this volume. For example, an item was included that details the kinship composition of the fishing parties in relation to the "head of party" (i.e., the respondent). There have been sociological and anthropological studies of kinship and family in contemporary America, but, to date, no detailed analysis have been made of the role of kinship in recreational activity in general, or in recreational fishing in particular. The addition of such an item presented the research team with an opportunity to explore relations between recreation, leisure-time partner choice and family social organization.

## Statistical Analysis

This report provides basic information about recreational fishing in the upper sounds of North Carolina. As a result, statistical techniques directly testing specific hypotheses will be limited. Instead, the vast majority of the statistics in this volume will be descriptive. Interval level data will be analyzed with respect to central tendency (e.g., mean, median, mode), including appropriate measures of dispersion, symmetry and peakedness (e.g., standard deviation). In addition, confidence intervals will be given at a 90 percent confidence level where appropriate. Nominal and ordinal level data will be viewed in terms of a variable's relative and absolute frequencies.[1]

Since this study is longitudinal in nature, methods for testing differences between 1981 and 1982 data will be applied. For this purpose, some of the ratio and interval level data for 1981 and 1982 will be compared using discriminant analysis. Discriminant analysis allows the study of differences between two or more groups with respect to several variables. For a detailed discussion of its applications, see Klecka (1981).

A variety of methods exist for calculating catch effort statistics (Kinch and O'Hara 1976; Caillovet and Higman 1973; Mullis and Guier 1979, 1981; Hassler, et al. 1981). Units can be based on fish caught per party per trip, fish caught per fishermen per fishing trip, or fish caught per fisherman per hour. For this study, catch effort statistics will be computed as the number of fish caught per fisherman per hour.

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[1] There has been recent debate over the existence of a possible sampling bias when using unadjusted values derived from intercept samples (Perdue, 1986). Values in this report were not adjusted for such a potential bias.

## CHAPTER 3
## PHYSICAL ENVIRONMENT AND HISTORICAL BACKGROUND

### Introduction

Recreational fishing is inextricably tied to physical environmental parameters. Recreational fishing, viewed as a human activity that utilizes the environment for the capture of fish, cannot be understood apart from the environmental features and conditions that foster and reward or inhibit the successful realization of that goal. Nor can the fishing activity be understood apart from the social context of the area. For this purpose. This chapter will discuss the physical and social contexts in which the research took place.

### The Research Area

The research area for this study encompasses a vast expanse of estuarine waters (See Map 3.1 & 3.2). From the north, this includes: Albemarle Sound and its tributaries, Croatan Sound, Roanoke Sound, Pamlico Sound, the Neuse River, and the Pamlico river and its tributaries. As mentioned previously, the research area included only those waters not requiring a North Carolina freshwater fishing license. For this reason, Currituck Sound was not included in this study.

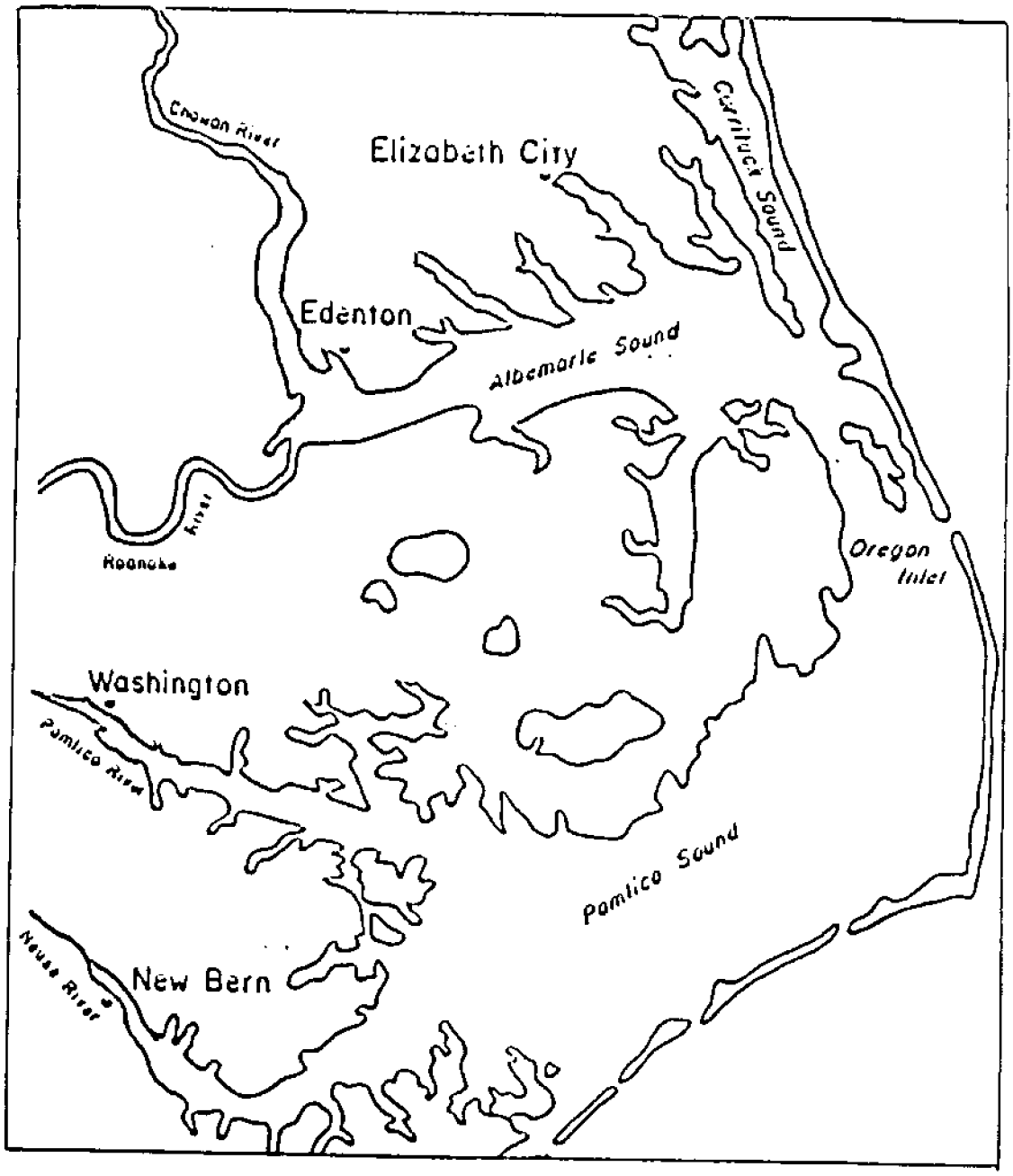
In the spring of 1981, the Roanoke River from its mouth upriver approximately 120 miles to Weldon and the Tar/Pamlico River from the river bridge in Washington to Old Sparta comprised a separate research area not dealt with in this chapter but examined in discussion of the 1981 river striped bass fishery.

The research area was initially divided into six regions. However, the Roanoke and Neuse rivers will not be discussed as separate entities in this chapter but treated as important elements in the estuarine system.

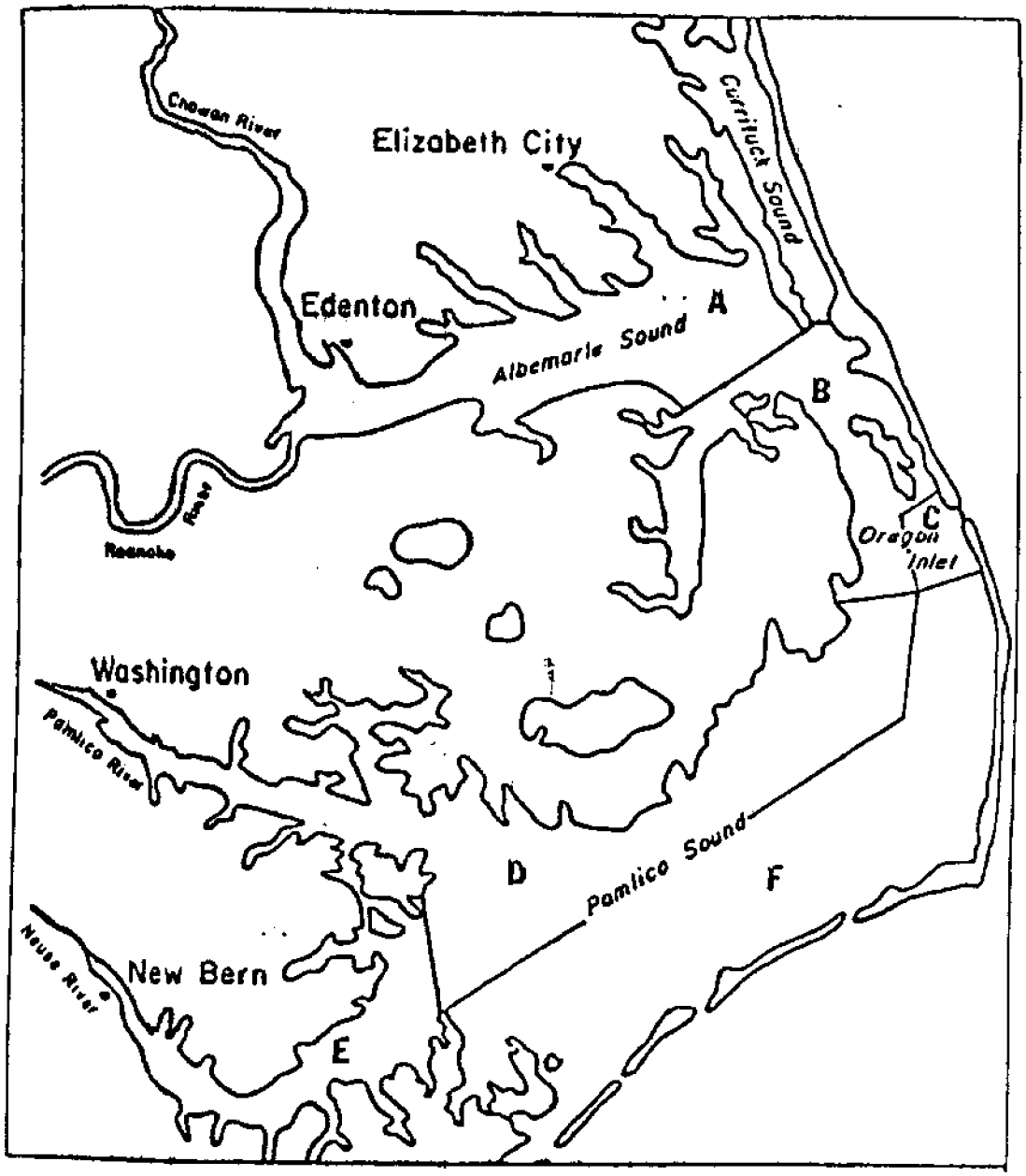
1. Roanoke River
2. Western Albemarle Sound
3. Eastern Albemarle Sound
4. Croatan and Roanoke sounds, including Oregon Inlet
5. Pamlico Sound (including Pamlico and Tar rivers)
6. Neuse River

The following general overview of the physical setting presents a detailed discussion of the geology, hydrology, and biology of the zone.

Map 3.1 Map of the Study Area.



Map 3.2 Study Area With Designated Analytical Regions




Key: A-Albemarle Sound Region, B-Croatan/Roanoke Island Region, C-Oregon Inlet Region, D-Western Pamlico Region, E-Neuse River Region, F-Eastern Pamlico Region

## The Physical Environment

### Overview of the Zone

The research area lies within the outer coastal plain of North Carolina, a low-lying, poorly drained region abutting the better drained, rolling topography of the coastal plain's inner zone (Lukin and Mauger, 1982). The Albemarle and Pamlico sounds dominate the topography of the research area. These shallow sounds, along with their associated adjacent waters, cover a geologically ancient segment of the coastal plain.

The interior waters of the sounds are separated from the Atlantic Ocean by a line of barrier islands (Outer Banks) breached by a series of inlets. The inlets regulate the ingress of fresh sea water and egress of mixed estuarine waters in accordance with diurnal tidal cycles. Rivers and streams discharge fresh water into the sounds thereby affecting salinity levels over a vast area. The interplay of these physical features has produced the second largest estuarine complex along the Atlantic coast, encompassing an area of approximately 5,100 square miles (Gusey, 1981).

Biological features of the estuarine system are linked to discharges from the Neuse, Pamlico, Pungo and Chowan rivers which provide an enormous volume of fresh water to mix with saline waters pouring through the inlets. Further mixing is accomplished by tidal flow and wind-driven currents moving over different bottom types. A constant supply of nutrients, fed into the system via freshwater runoff, support biological productivity in the estuaries.

Water depth in the Pamlico/Albemarle estuaries zone ranges from 30 feet in the channels to a scant few inches over shallow shoals. Along the estuarine periphery, shoal waters are interspersed with mud flats. Here the bottom may be sandy or muddy and lead back to beaches or salt marshes.

Tidal fluctuations range from three feet near inlets to almost no variation in remote areas. Salinity varies according to location. Waters are principally fresh at the mouths of the principal rivers but salinity levels rise in the open sounds, finally reaching oceanic levels near the inlets.

Salinity regimes fluctuate normally in response to seasonal precipitation levels. But intense periods of rainfall or particularly dry spells within spawning periods affect the harvest of some crustaceans and finfish. Gradations of salinity provide ecological niches for many species of marine plants and animals.

Temperatures in the area range from summer highs of 85 F (August) to winter lows of 40 F (January). Water temperatures in the sounds approximate seasonal air temperatures, and there is little variation in water temperatures over the tidal cycle. Annual precipitation averages 45 to 50 inches.

The importance of the estuarine system to North Carolina's commercial and recreational fisheries cannot be overstated. Biologists estimate that approximately 90 percent of the shellfish and finfish are estuarine dependent at some stage in their life cycle.

The average annual commercial catch of finfish from the Albemarle/Pamlico Sound between 1978 and 1982 was 20.8 million pounds, with an average worth of $4.6 million (ref. N.C. Div. Mar. Fish. Stats. 1978-82). The great diversity of freshwater and saltwater finfish in the Albemarle and Pamlico estuaries make the area one of the most attractive and valuable sportfishing spots in the United States.

## Hydrology

The term estuary, although variously defined (USDI, 1970), connotes a complex process of interaction between coastal rivers and oceanic tides. It is not our purpose to discuss the general dynamics of estuarine hydrology (see Giese, et al., 1979), but to briefly outline the hydrology of Pamlico and Albemarle estuaries.

### Pamlico Sound Estuary

Pamlico Sound is comprised of approximately 2,060 square miles of water. Lukin and Mauger (1983) note that it is the largest sound on the Atlantic coast. Two major river systems feed into Pamlico Sound, the Neuse River and the Tar/Pamlico River system. In addition to these, the waters from the Albemarle Sound Estuary enters Pamlico Sound by way of Croatan and Roanoke Sounds.

There are only three outlets to the ocean from Pamlico Sound. These are Oregon Inlet to the north and Hatteras and Ocracoke inlets to the south. The small number of outlets to the ocean limits the tide range to an estimated 0.2 feet. (Lukin and Mauger 1983). Although some water exits Pamlico sound via Core Sound and Drum Inlet at the southeastern end.

Pamlico Sound is bordered on the east by a series of barrier islands --- Hatteras Island, Ocracoke Island, Portsmouth Island and Core Banks.

Salinity ranges in Pamlico Sound vary according to location and time of year. In April, the average salinity for the sound's main body ranges from 18 to 20 ppt near the inlets to 10 to 12 ppt near the mouths of the rivers and along the western shorelines. In the late fall and early winter months, salinity increases. In December, average salinity for the sound's main body ranges from 17 to 20 ppt. Salinities are about 10 ppt up the Neuse and Pamlico rivers.

The extensive estuarine systems along the western fringe of the sound and in the Neuse, Pamlico and Pungo rivers provide excellent habitats for catadromous and quasi-catadromous species. These include: spot, croaker, gray trout and mullet.

## Albemarle Sound Estuary

Albemarle Sound lies at the northern end of the research area. It is approximately 55 miles long with an average width of 7 miles. The average depth of the Albemarle Sound measures 18 feet (Giese, et al. 1979:129; Lukin and Mauger, 1983).

The primary sources of water are the Roanoke and Chowan rivers at the western end of the Albemarle Sound and Currituck Sound on the eastern end. Water drains from Albemarle Sound through Croatan or Roanoke sounds into Pamlico Sound. Between 75 and 85 percent of the water discharged from Albemarle Sound flows through Croatan Sound, creating deep troughs in Croatan Sound parallel to the shorelines on the mainland and Roanoke Island (Lukin and Mauger 1983:14). This feature, in the vicinity of Mann's Harbor at the northern tip of Roanoke Island, presents prime fishing conditions for recreational fishermen.

The salinity of Albemarle Sound varies from almost fresh water to brackish water. Guise et al. (1979) report little or no saline stratification in the sound waters. On the average, salinities are lowest in March and highest in December. In December, salinities range from less than 2 ppt in the western sound to a maximum of 4 ppt along the eastern shore sound. (Note: Salinity is here measured as grams per kilogram of water) (Lukin and Mauger 1983:12,17). The low salinities in Albemarle Sound and feeder rivers provide a favorable habitat for anadromous species such as striped bass (Morone saxatilis) and clupeid species (shad and herring).

Pollutants entering rivers and feeder streams are a growing menace to the Albemarle estuary. Contaminants settle into bottom sediments because the remoteness of the Albemarle Sound from the ocean minimizes the flushing effects of tidal flow. Therefore, human activities within the watershed may adversely affect environmental quality in the estuary.

Other factors which threaten environmental quality in the Albemarle estuary include: 1) contamination of waters by heavy metals, pesticides or noxious organics; 2) disequalibrium of stream flow rates caused by damming (can interfere with migrations of anadromous fish and nutrient cycling in the estuary); and 3) contamination of shellfish by enteric bacteria from septic tanks (Copeland et al. 1983).

## Biological Resources

The fertility of estuaries is attributable to the minerals and organic nutrients transported by oceanic tides and freshwater runoff. The physical mixing processes within the estuary further distribute nutrients to the organisms inhabiting highly diverse ecological niches. Despite the well documented productivity of estuaries, the energy system supporting the proliferation of life is only partially understood. According to Gusey (1981), the following elements are involved in the productive system: 1) transport of debris and decay products from mainland, swamp and marshland plants into the estuary; 2) utilization of plant and animal detritus by bacteria, fungi and other small sedimentary organisms (some of which may

also feed on algae); and 3) actions of anaerobic bacteria in subsurface layers of tidal flats and bottom. The bacteria release oxygen, eliminate hydrogen sulphide and stabilize mineral reserves. Nutrients are exchanged and recycled among the lower life forms of the food chain and in turn are utilized by more complex creatures -- crustaceans, fish, birds and mammals.

## Estuarine Fisheries

The Albemarle and Pamlico estuaries serve as spawning grounds and primary nursery areas for freshwater anadromous and saltwater fishes. Biologists believe that many marine fish are dependent upon the estuarine zone during some stage of their life cycle. This view is supported by the fact that 90 percent of the fish landed in North Carolina are harvested from coastal waters and that two-thirds of these landings are of estuarine species (Gusey, 1981). The relative scarcity of biomass in the open sea compared with the enormous abundance of life in estuaries also confirms the dependence of recreational and commercial fisheries on estuarine waters.

## Fish Species - descriptive profiles

The finfish of the Pamlico and Albemarle estuaries that are described below are limited to those species often caught by the recreational fishermen who were interviewed in the creel census of this research. These include freshwater and saltwater fish. Many are also target species for commercial fishermen. Annual summaries of North Carolina commercial landings between 1978 and 1982 are listed below (Tables 3.1-3.8). There are no comparable figures for recreational landings which may, in certain instances (e.g. bluefish, croaker), exceed commercial landings.

TABLE 3.1

ALBEMARLE SOUND

| | 1978 | | 1979 | | |
|---|---|---|---|---|---|
| | POUNDS | VALUE | POUNDS | VALUE | VALUE RANK(S) |
| Alewives | 495,325 | 24,956 | 466,500 | 32,741 | 5 |
| Bluefish | 1,200 | 143 | 33,400 | 4,867 | 10 |
| Carp | 32,000 | 1,164 | 18,000 | 643 | |
| Catfish and Bullheads | 502,301 | 102,835 | 385,600 | 77,408 | 4 |
| Croaker | 100,700 | 15,844 | 123,000 | 21,439 | 7 |
| Eels | 33,300 | 21,134 | 97,200 | 77,998 | 3 |
| Flounder, Fluke | 4,400 | 2,678 | 14,700 | 8,552 | 9 |
| Gizzard Shad | 4,700 | 93 | 17,800 | 535 | |
| Hickory Shad | 3,700 | 743 | 21,300 | 3,190 | |
| Mullet | 18,200 | 3,833 | 18,800 | 4,341 | |
| Sea Trout, Gray | 15,500 | 3,440 | 10,800 | 2,552 | |
| Shad | 112,900 | 29,910 | 59,300 | 20,418 | 8 |
| Spot | 12,500 | 2,111 | 4,100 | 731 | |
| Striped Bass | 413,400 | 328,817 | 210,100 | 203,964 | 1 |
| White Perch | 239,600 | 66,433 | 89,800 | 25,368 | 6 |
| Yellow Perch | 23,300 | 5,218 | 3,500 | 763 | |
| Unclass. for Industrial | 77,100 | 2,409 | 169,000 | 5,167 | |
| Misc. Fish | 4,100 | 1,521 | 2,100 | 871 | |
| Crabs, Blue, Hard | 1,107,500 | 178,615 | 1,054,500 | 171,226 | 2 |
| Misc. Shellfish | 1,000 | 193 | 300 | 480 | |
| Total Fish | 2,099,226 | 613,282 | 1,745,000 | 491,548 | |
| Total Shellfish | 1,108,500 | 178,808 | 1,054,800 | 171,706 | |
| Totals | 3,207,726 | 792,090 | 2,799,800 | 663,254 | |

TABLE 3.2

ALBEMARLE SOUND

1980

| SPECIES | POUNDS | VALUE | VALUE RANK($) |
|---|---|---|---|
| Alewives | 680,476 | 51,882 | 6 |
| Bluefish | 21,444 | 2,034 | |
| Carp | 16,306 | 502 | |
| Catfish and Bullheads | 261,245 | 56,229 | 5 |
| Croaker | 405,506 | 60,539 | 4 |
| Eel, Common | 166,798 | 177,128 | 3 |
| Flounders, Fluke, Unclassified | 23,889 | 14,257 | 8 |
| Gizzard Shad | 82,503 | 2,475 | |
| Hickory Shad | 43,775 | 6,602 | |
| Mullet | 73,592 | 12,963 | 9 |
| Sea Trout, Gray | 67,878 | 15,736 | 7 |
| Shad | 27,599 | 8,724 | 10 |
| Striped Bass, Unclassified | 311,587 | 262,545 | 2 |
| White Perch | 21,792 | 5,625 | |
| Yellow Perch | 1,794 | 327 | |
| Unclassified for Industrial | 169,888 | 5,144 | |
| Miscellaneous Finfish | 31,124 | 6,401 | |
| Crab, Blue, Hard | 786,206 | 133,404 | 1 |
| Miscellaneous Shellfish | 10,293 | 6,790 | |
| Total Finfish | 2,407,196 | 689,113 | |
| Total Shellfish | 796,499 | 140,194 | |
| Totals | 3,203,695 | 829,307 | |

TABLE 3.3

ALBEMARLE SOUND

| SPECIES | 1981 POUND | VALUE | VALUE RANK($) |
|---|---|---|---|
| Alewives | 1,050,871 | 87,524 | 4 |
| Bluefish | 27,779 | 3,702 | |
| Carp | 48,053 | 1,995 | |
| Catfish and Bullheads | 388,626 | 93,389 | 3 |
| Croaker | 70,683 | 25,694 | 7 |
| Eel, Common | 100,257 | 55,100 | 5 |
| Flounders, Fluke, Unclassified | 21,787 | 15,905 | 9 |
| Gizzard Shad | 52,625 | 1,512 | |
| Hickory Shad | 46,375 | 5,978 | |
| Mullet | 77,014 | 14,669 | 10 |
| Sea Trout, Gray | 23,129 | 8,351 | |
| Shad | 38,342 | 16,468 | 8 |
| Spot | 21,259 | 4,899 | |
| Striped Bass, Unclassified | 273,698 | 268,762 | 2 |
| White Perch | 146,136 | 49,857 | 6 |
| Yellow Perch | 3,078 | 696 | |
| Unclassified for Industrial | 136,929 | 4,465 | |
| Miscellaneous Finfish | 3,203 | 1,881 | |
| Crab, Blue, Hard | 1,965,606 | 327,391 | 1 |
| Miscellaneous Shellfish | 443 | 307 | |
| Total Finfish | 2,529,844 | 660,847 | |
| Total Shellfish | 1,966,049 | 327,698 | |
| Totals | 4,495,893 | 988,545 | |

TABLE 3.4

ALBEMARLE SOUND

| SPECIES | 1982 POUNDS | 1982 VALUE | VALUE RANK($) |
|---|---|---|---|
| Alewives | 1,558,873 | 144,751 | 3 |
| Bluefish | 6,385 | 778 | |
| Carp | 31,935 | 426 | |
| Catfish and Bullheads | 276,400 | 45,829 | 5 |
| Croaker | 117,011 | 45,159 | 6 |
| Eel, Common | 34,889 | 19,377 | 9 |
| Flounders, Fluke, Unclassified | 53,134 | 36,881 | 7 |
| Gizzard Shad | 103,592 | 5,180 | |
| Hickory Shad | 14,026 | 2,954 | |
| Mullet | 44,324 | 8,074 | |
| Sea Trout, Gray | 13,071 | 5,214 | |
| Sea Trout, Spotted | 5,567 | 4,133 | |
| Shad | 57,221 | 19,484 | 8 |
| Sheepshead | 548 | 46 | |
| Spot | 35,776 | 8,480 | 10 |
| Striped Bass, Unclassified | 141,388 | 197,587 | 2 |
| White Perch | 227,183 | 104,236 | 4 |
| Yellow Perch | 5,266 | 1,868 | |
| Unclassified for Industrial | 118,852 | 5,562 | |
| Misc. Fish | 1,573 | 326 | |
| Crab, Blue, Hard | 3,305,425 | 589,506 | 1 |
| Shrimps (heads on) | 1,324 | 3,534 | |
| Misc. Shellfish | 761 | 1,522 | |
| Total Finfish | 2,847,014 | 656,345 | |
| Total Shellfish | 3,307,510 | 594,562 | |
| Totals | 6,154,524 | 1,250,907 | |

TABLE 3.5

PAMLICO SOUND

| SPECIES | 1979 POUNDS | 1979 VALUE | VALUE RANK($) |
|---|---|---|---|
| Alewives | 3,000 | 216 | |
| Bluefish | 481,900 | 70,961 | 9 |
| Butterfish | 44,900 | 11,998 | |
| Catfish and Bullheads | 1,400 | 236 | |
| Croaker | 8,050,000 | 1,560,368 | 3 |
| Drum, Black | 2,800 | 322 | |
| Drum, Red | 35,300 | 5,834 | |
| Eels, Common | 75,900 | 64,051 | 10 |
| Flounder, Fluke, Unclassified | 644,200 | 308,262 | 6 |
| Harvestfish | 14,900 | 2,331 | |
| Hickory Shad | 3,000 | 682 | |
| King Whiting | 22,000 | 5,275 | |
| Mullet | 149,200 | 32,173 | |
| Pigfish | 7,400 | 1,015 | |
| Pompano | 3,100 | 2,466 | |
| Sea Trout, Gray | 2,055,500 | 414,756 | 4 |
| Sea Trout, Spotted | 29,900 | 12,422 | |
| Shad | 69,500 | 30,674 | |
| Sheepshead | 9,700 | 1,108 | |
| Spanish Mackerel | 200 | 53 | |
| Spot | 2,053,200 | 358,717 | 5 |
| Striped Bass, Unclassified | 6,500 | 6,387 | |
| Sturgeon | 4,700 | 1,070 | |
| White Perch | 29,600 | 7,378 | |
| Unclassified for Industrial | 4,305,200 | 134,546 | 8 |
| Misc. Fish | 1,500 | 138 | |
| Crab, Blue, Hard | 12,572,100 | 2,105,671 | 1 |
| Crab, Blue, Soft | 13,600 | 22,622 | |
| Shrimp (heads on) | 791,700 | 1,804,789 | 2 |
| Oyster (meats) | 232,800 | 294,417 | 7 |
| Misc. Shellfish | 28,100 | 12,095 | |
| Total Fish | 18,104,500 | 3,033,439 | |
| Total Shellfish | 13,638,300 | 4,239,594 | |
| Totals | 31,742,800 | 7,273,033 | |

TABLE 3.6

PAMLICO SOUND

| SPECIES | 1980 POUNDS | 1980 VALUE | VALUE RANK($) |
|---|---|---|---|
| Alewives | 5,263 | 527 | |
| Bluefish | 748,911 | 96,851 | 10 |
| Butterfish | 50,306 | 15,374 | |
| Catfish and Bullheads | 8,713 | 1,333 | |
| Croaker | 10,682,151 | 2,383,200 | 3 |
| Drum, Black | 21,987 | 2,288 | |
| Drum, Red | 88,621 | 16,770 | |
| Eel, Common | 85,443 | 97,872 | 9 |
| Flounder, Fluke, Unclassified | 1,523,567 | 796,066 | 5 |
| Harvestfish | 91,590 | 17,489 | |
| Hickory Shad | 7,503 | 938 | |
| King Whiting | 38,415 | 11,608 | |
| Mullet | 160,967 | 26,700 | |
| Pigfish | 12,608 | 1,459 | |
| Pompano | 4,789 | 2,185 | |
| Sea Trout, Gray | 4,304,110 | 958,517 | 4 |
| Sea Trout, Spotted | 38,644 | 16,281 | |
| Shad | 44,564 | 20,799 | |
| Sheepshead | 12,294 | 1,319 | |
| Spanish Mackerel | 4,379 | 1,397 | |
| Spot | 2,600,787 | 523,082 | 6 |
| Striped Bass, Unclassified | 5,282 | 7,880 | |
| Sturgeon | 1,880 | 541 | |
| White Perch | 7,285 | 2,631 | |
| Unclassified for Industrial | 3,847,140 | 135,463 | 8 |
| Miscellaneous Finfish | 3,309 | 833 | |
| Crab, Blue, Hard | 19,479,503 | 3,325,822 | 2 |
| Crab, Blue, Soft | 17,167 | 26,349 | |
| Shrimp (heads on) | 3,893,870 | 7,581,032 | 1 |
| Oyster (meats) | 341,729 | 453,187 | 7 |
| Miscellaneous Shellfish | 1,204 | 328 | |
| Total Finfish | 24,400,508 | 5,138,403 | |
| Total Shellfish | 23,733,473 | 11,386,718 | |
| Water Total | 48,133,981 | 16,525,121 | |

TABLE 3.7

PAMLICO SOUND

| SPECIES | 1981 POUNDS | 1981 VALUE | VALUE RANK($) |
|---|---|---|---|
| Alewives | 39,774 | 3,627 | 8 |
| Bluefish | 530,472 | 67,680 | 10 |
| Butterfish | 118,493 | 53,567 | |
| Catfish and Bullheads | 23,980 | 9,126 | |
| Croaker | 7,277,205 | 2,449,372 | 2 |
| Drum, Black | 9,838 | 1,062 | |
| Drum, Red | 49,874 | 9,077 | |
| Eel, Common | 11,905 | 5,866 | |
| Flounder, Fluke, Unclassified | 1,108,127 | 718,723 | 4 |
| Harvestfish | 38,839 | 10,127 | |
| Hickory Shad | 18,774 | 3,373 | |
| King Whiting | 30,687 | 9,755 | |
| Mullet | 128,977 | 23,037 | |
| Pigfish | 12,566 | 2,465 | |
| Pompano | 6,336 | 4,182 | |
| Sea Trout, Gray | 2,636,784 | 1,006,901 | |
| Sea Trout, Spotted | 50,174 | 27,114 | |
| Shad | 97,106 | 59,955 | 9 |
| Sheepshead | 3,892 | 489 | |
| Spadefish | 13,176 | 2,347 | |
| Spanish Mackerel | 1,809 | 656 | |
| Spot | 1,417,371 | 312,944 | 5 |
| Striped Bass, Unclassified | 3,556 | 3,618 | |
| Sturgeon | 1,259 | 411 | |
| White Perch | 15,212 | 4,666 | |
| Unclassified for Industrial | 3,929,345 | 145,800 | 7 |
| Miscellaneous Finfish | 6,926 | 1,178 | |
| Crab, Blue, Hard | 19,501,129 | 4,286,912 | 1 |
| Crab, Blue, Soft | 8,908 | 7,700 | |
| Shrimp (heads on) | 749,286 | 1,750,904 | 3 |
| Oyster (meats) | 192,005 | 254,183 | 6 |
| Miscellaneous Shellfish | 1,825 | 6,021 | |
| Total Finfish | 17,582,457 | 4,937,118 | |
| Total Shellfish | 20,453,153 | 6,305,720 | |
| Totals | 38,035,610 | 11,242,838 | |

TABLE 3.8

PAMLICO SOUND

| SPECIES | 1982 POUNDS | 1982 VALUE | VALUE RANK($) |
|---|---|---|---|
| Alewives | 4,565 | 429 | 10 |
| Bluefish | 685,673 | 97,168 | |
| Butterfish | 34,297 | 17,197 | |
| Cobia | 248 | 28 | |
| Catfish and Bullheads | 1,975 | 298 | |
| Croaker | 6,627,288 | 2,321,422 | 3 |
| Drum, Black | 3,027 | 300 | |
| Drum, Red | 7,582 | 1,609 | |
| Flounder, Fluke, Unclassified | 984,468 | 711,509 | 5 |
| Harvestfish | 192,841 | 74,393 | 10 |
| Hickory Shad | 2,720 | 521 | |
| King Whiting | 116,315 | 37,828 | |
| Mullet | 66,708 | 12,313 | |
| Pigfish | 34,427 | 6,537 | |
| Pompano | 18,892 | 18,736 | |
| Sea Trout, Gray | 2,087,036 | 790,836 | 4 |
| Sea Trout, Spotted | 45,404 | 32,155 | |
| Shad | 122,898 | 61,070 | |
| Sheepshead | 7,502 | 854 | |
| Spadefish | 1,804 | 181 | |
| Spanish Mackerel | 14,380 | 5,069 | |
| Spot | 2,895,982 | 601,869 | 6 |
| Striped Bass, Unclassified | 4,345 | 6,097 | |
| Sturgeon | 931 | 200 | |
| White Perch | 10,336 | 4,793 | |
| Unclassified for Industrial | 3,815,163 | 162,487 | 8 |
| Misc. Fish | 5,976 | 2,152 | |
| Crab, Blue, Hard | 18,264,380 | 3,379,599 | 2 |
| Crab, Blue, Soft | 8,353 | 16,404 | |
| Shrimp (heads on) | 2,523,468 | 6,836,646 | 1 |
| Oyster (meats) | 249,167 | 362,482 | 7 |
| Misc. Shellfish | 5,834 | 15,297 | |
| Total Fish | 17,792,783 | 4,968,042 | |
| Total Shellfish | 21,051,202 | 10,610,428 | |
| Totals | 38,843,985 | 15,578,470 | |

## Freshwater Species

ORDER PERCIFORMES, Family Percichthyidae

White Perch, Morone americana. Range extends from New Brunswick, Nova Scotia to Georgetown, S.C. The species may be anadromous or semi-anadromous. In North Carolina, the species is restricted to estuaries (USDI, 1978). In the Albemarle, white perch represented 64.8 percent of the recreational catch.

ORDER SILURIFORMES, Family Arlidae

Catfish: Gafftopsail (Bagre marinus) and sea catfish (Arius felis) are the two most frequently caught species of catfish along the Atlantic Seaboard. Range extends from Cape Cod to the Gulf of Mexico. The freshwater commercial catch of sea catfish in the South Atlantic is substantial (Gusey, 1981). Catfishes represented 11.2 percent of the recreational catch.

## Saltwater Species

ORDER PERCIFORMES, Family Sciaenidae

Atlantic Croaker, Micropogon undulatus. Range extends from Massachusetts to the Gulf of Mexico (most abundant from Delaware to Hatteras). An important commercial species along the South Atlantic coast. The sport fishery of croaker in the Pamlico Sound might exceed that of the commercial fishery (Roberts et al., 1974). Creel data shows that croaker catches represented 81.7 percent of the total catch in the Croatan/Roanoke region; 26 percent in Oregon Inlet, 67.9 percent in western Pamlico Sound, 62.4 percent in the Neuse River area and 28.8 percent in eastern Pamlico Sound.

Spot, Leiostomus xanthurus. Ranges from Cape Cod to northern Mexico. North Carolina 1978-1982 commercial landings of spot averaged 5.52 million pounds, and the species is avidly sought by recreational fishermen (Gusey, 1981). At the Oregon Inlet, spot represented 9.9 percent of the recreational catch.

Speckled Trout, Cynoscion nebulosus. Ranges from Chesapeake Bay to the Gulf of Mexico.

Gray Trout, Cynoscion regalis. Commonly known as weakfish, sea trout and yellow fin. Highly prized by commercial and recreational fishermen. Range extends from Massachusetts to Florida. Over 20 million pounds were landed in 1980 by North Carolina commercial fishermen; one-quarter of that total was harvested from Pamlico Sound.

Family Percichthyidae

Striped Bass, Morone saxatilis. Most common from Cape Cod to North Carolina. Range extends from St. Lawrence River, Canada to the St. Johns River in Florida. All stocks of the eastern Seaboard (with the exception of landlocked populations) have severely diminished in recent years.

Family Pomatomidae

Bluefish, Pomatomus saltatrix. Range extends from Cape Cod to the Florida Keys.

Family Mugilidae

Sea Mullet, Mugil curema. Range extends from Massachusetts and Bermuda to Brazil and the Gulf of Mexico. Landings of sea mullet in the Albemarle and Pamlico sounds are not significant (Tables 3.1-3.8).

ORDER PLEURONECTIFORMES, Family Bothidae

Summer Flounder, Paralichthys dentatus. Ranges from Maine to the Gulf of Mexico but is most abundant in the Mid-Atlantic region. Stocks declining since 1960s (Gusey, 1981).

## History of Recreational Fishing in North Carolina

### Introduction

There have been significant changes in sport fishing over the last century. For North Carolina, these changes can be traced to altered work patterns and new potentials for leisure time (Johnson and Metzger 1983). Other changes can be attributed to advancements in technology and the adoption and marketing of new products (e.g. trailerable boats, fishing reels, durable lines, etc.). Still other changes, linked to improvements in transportation, have widened access to fishing opportunities. This is particularly true for the North Carolina Outer Banks, isolated for years from general access. In the following sections, we explain the development of recreational fishing in eastern North Carolina.

### The early years

During the colonial period and into the 19th century, recreation played a minor role in the lifestyles of Americans. As a newspaper reporter observed: "It is doubtful whether the early settlers ever thought of

either fish or game as a sporting proposition." (News & Observer, April 20, 1942). (Dulles, History of Recreation, p. 3-5).

Some colonists did find time for recreation, and fishing was, no doubt, one of the more popular sports. There are numerous recorded instances of early Americans, from New England through the Carolinas and Georgia, enthusiastically seeking sturgeon, bass, shad, herring, trout, and other fish and shellfish. "They have hunting, fishing and fowling, with which they entertain themselves in a hundred ways," Robert Beverly wrote of Virginians. Even George Washington enjoyed using a line and pole occasionally.

Travelers in colonial North Carolina mentioned the abundance of fish in the colony. Captain Arthus Barlowe explored Roanoke Island in 1584 for Sir Walter Raleigh and mentioned finding the waters "alive with the goodliest and best fish in the world." The English naturalist, Mark Catesby, wrote of seeing streams so full of herring that people cast them on shore with shovels. (John Brickell, The Natural History of North Carolina, p. 260; Lefler & Newsome, North Carolina, p. 20; Mark Catesby, The Natural History of Carolina, Florida, and the Bahama Islands, Vol. I, xxxiii. See also John Lawson, A New Voyage to Carolina, p. 164-165). Colonial state and court records frequently mention fish and fishing. Although most fishing was done for home consumption, those engaged in this activity often did so as much for recreation as subsistence.

In the mid-1800s, recreational fishing attained the status of a recognized sport. Guion Griffin Johnson, in her book Ante-bellum North Carolina, writes, "fishing, cockfighting, and horse racing were . . . favorite forms of recreation." (p. 86).

Most of the fishing was in the rivers, creeks and lakes, but sound waters and even the ocean became increasingly attractive in the 19th century. In 1838 the first hotel at Nag's Head was completed, and by the 1850s, there were a number of private cottages belonging to nonresidents on the banks. By the Civil War, it was common for planters and businessmen from eastern North Carolina to take their families to the Outer Banks, during the summer months (David Stick, Dare County, p. 55; Stick, The Outer Banks in North Carolina History, 98). Settlements and resort concentrations were initially on the sound. Most of the shore fishing and all of the boat fishing was done in the sounds.

In 1852, a two-story hotel was built at Beaufort. This hotel became a center of the tourist industry in the area. Six years later a railroad was completed to Morehead City. These two events marked the beginning of a sportfishing industry along that part of the coast. (News and Observer, August 2, 1955).

The art of angling started in the 1840s, but it was not widely practiced in North Carolina until the late 1800s. One authority wrote: "The chief consequence of the American Civil War for saltwater sportsmen was that it delayed the angling exploration of much of the southern coast." (Reiger, Profiles in Saltwater Angling, p. 46). After the war, angling

became popular. In 1877, an Elizabeth City newspaper wrote that "the sound near Oregon (Inlet) is alive with 'old drums,' and trolling furnishes sport and happiness to many an angler." (The Economist, June 6, 1877).

The hook-and-line fishing was popular throughout the 1800s and well into the 1900s.

There was little boat fishing in the ocean during this period. The Beaufort Weekly Record noted in 1888: "If some of our enterprising citizens would fit up a nice craft to carry visitors out to sea to engage in deep sea fishing, it would be a paying investment." (June 22, 1888). This recommendation was ignored. It was 50 years before deep sea recreational fishing took hold in North Carolina.

## Fishing in the Twentieth Century

Early in the 20th century surf casting was introduced to North Carolina, contributing to the growth of recreational fishing. (Charlotte Daily Observer), December 5, 1915).

In 1929, a newspaper article from Norfolk said that those were "the days of real sport on the Carolina Banks. Almost every train that roars into the Union Station [in Norfolk], almost every steamer that docks from Boston, New York, Philadelphia, Washington, Baltimore, and other points North disgorge its quota of avid sportsmen who, gun or reel in hand, hurry away (to the Banks)." (The News & Observer, November 24, 1929).

By the 1930s, fishing guides had become a fixture of recreation fishing along North Carolina's coast. Most had boats for surf or sound fishing. In most cases, the guides were local commercial fishermen.

The 1930s also witnessed the birth and growth of charter boats for sport fishing. The concept of chartering or leasing a boat was not new. At the turn of the century, tourists in the Beaufort-Morehead City area chartered or rented sailing vessels to get to the banks or into the sounds. (Sue Willis, "The Charter Boat Industry of Morehead City," p. 4).

By the late 1920s, most boats were powered by outboard motors or converted automobile engines. Commercial fishing vessels were chartered when commercial fishing was not profitable or when a fishing party could be arranged. The absence of radios and other equipment generally limited the charters to sound and inshore waters. (Chester Davis, "The Big Ones are there," The State Magazine, XXVI (August 23, 1958), p. 7; Willis, "The Charter Boat Industry of Morehead City," p. 5. Ms. Willis, member of a Carteret fishing family, interviewed a number of local fishermen). During the depression, charter fees ranged from $12.00 to $20.00 per day. By the late 1930s, more than 30 vessels were participating in charter fishing in Morehead City (Willis, "The Charter Boat Industry in Morehead City," p. 5).

Frank Stick in an article entitled "Sport Fishing Manteo to Hatteras," published in the April 2, 1937 issue of the Dare County Times, wrote

> Within the past three years the number of anglers who visited Dare County has increased at least a thousand percent and it is just beginning. Back in 1930 and thereabouts, it was most unusual to see more than three or four boats plying out of Oregon Inlet during the spring and early summer run of channel bass and bluefish and rarely would there be more than a half dozen surf fishermen on the beach in miles of our coast. Last spring I counted 89 fishing boats within a radius of three miles and this was not nearly all in commission that day. . . These fishermen will require guides, baits, accommodations and it will mean employment at good returns to a vast number of our citizens. . . I have not mentioned the sport that is to be found in our sounds and bays, . . . This type of fishing is well enough known to require no comment. . .It has been stated, and I believe without exaggeration, that during the past three years the revenue to Dare County from what is locally termed sport fishing has been greater than that derived from commercial fisheries...

In 1939 the first surf casting tournament was held in North Carolina. The contest was held between May and August, and newspapers reported several thousand anglers entered. (Beaufort News, April 6, May 4, 1939).

World War II curtailed recreational fishing. Military necessities, transportation restrictions and rationing contributed to the decline. In 1944, the federal government relaxed its control over some materials and products such as lumber, rope, and machinery parts. The Coast Guard also removed restrictions on party boats, allowing them to fish in the sounds and ocean if they returned to port before dark. (State Port Pilot/Southport/May 10, 1944). Sport fishing began to thrive again.

The most dramatic development in sport fishing in North Carolina after World War II was in ocean fishing. In 1948, 32 party boats operated at Morehead City and 26 on Roanoke Island. (Bill Sharpe, "Floating Factories," The State, XVI/June, 1948/ 3-4; Willis, "The Charter Boat Industry in Morehead City," p. 17). By 1958, more than 20 major fishing centers chartered boats in addition to dozens of individual operations. There were 19 ocean fishing piers in use that year. As one writer noted, "Saltwater fishing is a multimillion dollar business in North Carolina--and still growing." (Old Trudge, "Everybody's Doing It," The State, XXVI/June, 1958/ 12. See also Beaufort News, March 25, 1948; Bill Sharpe, "Marine Game Fishing is Big Business," The State, XIV/December, 1946/, 3-4, 22.) Despite the growth of ocean fishing, most fishermen still preferred the sounds, inlets and surf in the 1950s. (G.S. Dunbar, Historical Geography of the North Carolina Outer Banks, 85).

The use of rental boats had become popular with recreational fishermen in the 1930s and started up again when World War II was over (Beaufort News, April 6, 1939; News & Observer, April 15, 1951; "Heart's Delight," The State, xxii/July, 1954/, 11, 15, 16, 25, 26). In the post war years the majority of sports fishermen wanting to fish on the water rather than from shore continued to rent boats.

During the 1950s and 1960s, the popularity of sport fishing increased dramatically across the nation, including the Albemarle Sound/Outer Banks region.

This growth can be explained in several ways. With the end of World War II, rationing and restrictions were abolished. Gasoline became plentiful. During the war, meat rationing had resulted in a rise in the consumption of fish and shellfish (which was not rationed). Within a decade after the war, one out of every four Americans purchased a home freezer or a refrigerator with a freezing unit. Now anglers could store their catch.

After World War II, per capita income increased dramatically. This rise resulted in a rapidly expanding middle class and an increase in time devoted to recreation. As automobiles became more affordable, the highway system expanded and more people expended the time and capital to travel. These factors spurred the growth of sport fishing. Transportation played a key role in the expansion of sport fishing in North Carolina.

The Albemarle Sound and Outer Banks areas were isolated. Until well into the 20th century, water transportation was almost the sole means of traveling and shipping in the region. Automobiles were introduced in the Albemarle Sound area early in the century, but it was 1919 before the first automobile reached the Outer Banks (Outlaw, Old Nag's Head, p. 52). In the late 1920s, a hard-surfaced road was built on Roanoke Island and a toll bridge built to connect the island with Nag's Head. The island, however, remained inaccessible from the mainland. (Stick, Dare County, 52-53).

In the late 1920s and early 1930s, the state began a road-and-bridge program that would gradually link the entire region. By 1940 the Albemarle Sound area was crisscrossed with hard-surfaced roads and linked by bridges, but the Banks remained inaccessible to automobile traffic. (News & Observer, May 19, 1929, August 14, 1938; Stick, Outer Banks, 246-247). After World War II the state built a hard-surfaced road running from Oregon Inlet to Hatteras Village. The final links were the bridges connecting Roanoke Island with the mainland, completed in 1963.

By 1957, tourism had supplanted commercial fishing as the number one industry in Dare County. In 1940, there were no motels in Hatteras Village or on Roanoke Island and only two motels at Nag's Head. By 1955, there were 15 hotels, 60 motels, and approximately 500 rental cottages in Dare County. (The State, XXIII (December, 1955), p. 106). Accommodations were slower to develop along the rivers.

With improvements in transportation came an increase in the private ownership of recreational fishing boats. This would end the rental of fishing skiffs. Now, many middle-class families purchased small fishing boats and trailered them to the coast or sound. Consequently, marinas began installing boat ramps to offload the boats.

With the construction of the Bonner Bridge, 70 miles of beach south of the inlet on Hatteras Island became accessible to surf fishermen. National Park Service records indicate that the yearly average of surf-casting at the Cape Hatteras National Seashore was 302,927 fisherman days for the period of 1978 to 1980.

# CHAPTER FOUR
# FISHERMEN'S PROFILE

## Introduction

This chapter provides information about marine recreational fishermen that frequent the upper sounds of North Carolina, such as age, sex, income, education, and occupation. In addition, information is included on the social aspects of fishing, i.e., fishing partners and an angler's investment in fishing gear and related equipment.

## Income

Income is an important factor influencing recreational fishing behavior and patterns. A fisherman's choices are limited and bounded by the extent to which money is available to him. For those who have money, there are many alternatives.

In a paper related to this project and in a 1979 study of offshore fishing in North Carolina, various sociodemographic variables were compared between two data sets (Johnson 1982) --- nearshore/offshore fishermen who target species from the inlets and beachs to the Gulf Stream (e.g., nearshore-midwater species) and fishermen who fish the waters of the Gulf Stream.

Sound and nearshore/offshore fishermen were similar in total household income distributions. But a comparison of these anglers with Gulf Stream fishermen revealed a statistically significant difference in income distributions. The Gulf Stream fishermen made more money than both sound and nearshore/offshore fishermen (Table 4.1).

Table 4.1. Comparisons of socioeconomic characteristics between offshore and sound fishermen.

| | | |
|---|---|---|
| **Offshore** | | |
| (Gulf Stream Species versus Nearshore-Offshore Species) | | |
| By Occupation | $x^2 = 9.49$ | $f(x^2) = NS$ |
| By Education | $x^2 = 12.663$ | $f(x^2) = .017$ |
| By Income | $x^2 = 22.122$ | $f(x^2) = .001$ |
| **Sound versus Offshore Controlling for Species Sought** | | |
| (Nearshore-Midwater) | | |
| By Education | $x^2 = 56.852$ | $f(x^2) = .0000000001$ |
| By Income | $x^2 = 10.50$ | $f(x^2) = NS$ |

Differences between groups were based on basic modes of fishing. These two basic modes, boat and bank fishing, relate to the physical location, the degree of mobility, and overall investment. Boat fishing is defined as any recreational fishing incorporating a boat of any type or size; bank fishing incorporates no boat and is done from a bank, pier, bridge, or other fixed structure.

A comparison of income distributions for these groups for 1981 reveals a large percentage of bank fishermen, 21.0 percent, have an income of $11,999 or less within the low income category in Table 4.2. For boat fishermen in the same category, only 2.8 percent have an income less than $11,999 (Tables 4.2 & 4.3). Within the low income category, 10.5 percent of the bank fishermen had an income of $4,999 or less. Boat fishermen had only 0.9 percent in the same category. Examining the same categories for 1982 reveals comparable results. Bank fishermen comprised 28.8 percent with incomes $11,999 or less, but only 5.3 percent of the boat fishermen had similar incomes. Within this category, 16.8 percent of the bank fishermen and 1.5 percent of the boat fishermen had an income of $4,000 dollars or less. (Table 4.4).

Table 4.2. Income By Region For Bank Fishermen In 1981.

| ROW PCT<br>COL PCT | LOW<br>(0-$14,999) | MEDIUM<br>($15,000-$34,999) | HIGH<br>($35,000+) |
|---|---|---|---|
| REGION | | | |
| ALBEMARLE | 45.0% | 45.0% | 10.0% |
| SOUND | 23.1% | 16.4% | 10.5% |
| COMPLEX | (9) | (9) | (2) |
| CROATAN | | | |
| SOUND/ | 23.9% | 52.4% | 23.9% |
| ROANOKE | 25.6% | 40.0% | 52.6% |
| ISLAND | (10) | (22) | (10) |
| OREGON | 15.4% | 53.9% | 30.8% |
| INLET | 5.1% | 12.7% | 21.0% |
| | (2) | (7) | (4) |
| PAMLICO | 42.3% | 49.9% | 7.6% |
| ESTUARINE | 28.2% | 23.6% | 10.5% |
| COMPLEX | (11) | (13) | (2) |
| NEUSE | 61.6% | 30.8% | 7.7% |
| RIVER | 20.5% | 7.2% | 5.2% |
| COMPLEX | (8) | (4) | (1) |
| | 39 | 55 | 19 |
| TOT. PCT | 34.51% | 48.67% | 16.81% |

Table 4.3. Income By Region For Boat Fishermen In 1981.

| ROW PCT<br>COL PCT | LOW<br>(0-$14,999) | MEDIUM<br>($15,000-$34,999) | HIGH<br>($35,000+) |
|---|---|---|---|
| REGION | | | |
| ALBEMARLE | 17.5% | 65.12% | 17.37% |
| SOUND | 48.08% | 48.97% | 34.62% |
| COMPLEX | (25) | (95) | (27) |
| CROATAN | | | |
| SOUND | 11.11% | 88.89% | 5.56% |
| ROANOKE | 3.85% | 8.25% | 1.28% |
| ISLAND | (2) | (16) | (1) |
| OREGON | 15.22% | 52.17% | 32.61% |
| INLET | 13.46% | 12.37% | 19.23% |
| | (7) | (24) | (15) |
| PAMLICO | 14.47% | 47.37% | 38.16% |
| ESTUARINE | 21.15% | 18.56% | 37.18% |
| COMPLEX | (11) | (36) | (29) |
| NEUSE | 16.67% | 66.67% | 16.67% |
| RIVER | 3.85% | 41.24% | 2.56% |
| COMPLEX | (2) | (8) | (2) |
| EASTERN | | | |
| PAMLICO | 20.00% | 64.00% | 16.00% |
| OUTER | 9.61% | 8.25% | 5.13% |
| BANKS | (5) | (16) | (4) |
| | 52 | 194 | 78 |
| PCT | 16.05% | 59.88% | 24.07% |

Table 4.4. Income distribution for recreational fishermen in 1982.

| | Low (0-$15,999) | Median ($16,000-$35,999) | High ($36,000+) |
|---|---|---|---|
| Boat | 14.3% (N=38) | 58.3% (N=155) | 27.4% (N=73) |
| Bank | 36.4% (N=24) | 56.2% (N=37) | 15.0% (N=10) |

Regional distributions showed many bank fishermen in the Oregon Inlet and Croatan Sound/Roanoke Island areas with incomes of $35,000 or more. In contrast, in the Albemarle Sound region in 1981, 45.0 percent of the fishermen were in the low income category. In the Pamlico estuarine and Neuse River area, 42.3 and 61.6 percent, respectively, of the bank fishermen fall within this income category.

In part, these differences resulted from the sampling procedure, which concentrated near the Oregon Inlet ramp and a popular fishing bridge between Roanoke Island and the Outer Banks. In addition, this area is heavily fished by tourists who are vacationing or camping near Nags Head or Oregon Inlet. The other regions are fished by resident bank fishermen who tend to have lower incomes than boat fishermen or vacationing bank fishermen.

Bank fishermen who use the sounds have the lowest overall income of marine recreational fishermen. They are followed by sound and nearshore/offshore anglers with more moderate incomes. It is not surprising that the fishermen with the highest overall income are those who seek game species found further offshore. The requisite investment and expenditures for such fishing dictate the availability of large amounts of capital. Consequently, income acts as a constraint on the range of fishing alternatives.

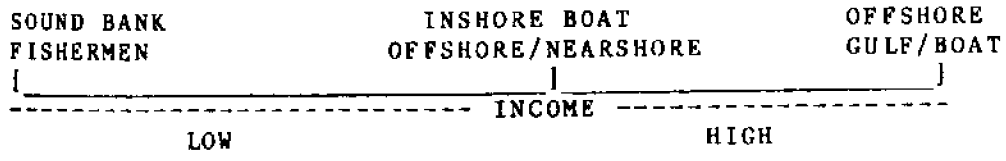



FIGURE 4.1. GENERAL DISTRIBUTION OF INCOME AMONG TYPES OF FISHERMEN IN THE MARINE WATERS OF NORTH CAROLINA.

The recreational fishermen in this study, whether boat or bank, tend to have higher incomes as a group than the general population of North

Carolina. Table 4.1.1 gives the state figures. There is a larger percentage of recreational fishermen in the medium and high income brackets than there is in the general state populace. Only one region of bank fishermen (the Neuse River area (61.6 percent)) showed a tendency for incomes lower than the state figures.

Table 4.1.1. Household Income Distribution for the State of North Carolina.

| | Low (0-$14,999) | Medium ($15,000-$34,999) | High ($35,000+) |
|---|---|---|---|
| 1980 | 51.6% | 40.17% | 8.21% |

In other income matters, avidity (i.e., times fished during the year) was compared with the two sound fishing populations to discover if lower income fishermen supplemented their diet and their income with fish. However, an analysis of variance between income categories and avidity for each population produced no significant F- statistic for any group comparisons.

## Education

Although education cannot be considered a limiting factor, it may be important in understanding the choices individuals make about various recreational and leisure activities once income is not a constraint. Education's role in influencing people's decision-making processes, however, is often difficult to decipher because of the strong relationship between income and education. This section will present information on the educational level of the recreational fishermen in this study.

Table 4.5 gives the distribution of educational attainment for bank and boat fishermen. Among bank fishermen, 24.8 percent had nine years or less of education; 14.3 percent of the boat fishermen were similarly educated. With respect to high school, 46.3 percent of the boat fishermen and 36.6 percent of the bank fishermen had completed 10 to 12 years. Surprisingly, 27.7 percent of the bank fishermen and 30.3 percent of the boat fishermen had at least two to four years of college (including trade school training). In addition, 5.4 percent of both groups completed graduate school.

Table 4.5. Education of Recreational Fishermen by Mode of Fishing (1981 and 1982).

| | Bank | Boat |
|---|---|---|
| 0-3 yrs. | 3.0% (N=3) | 0.9% (N=6) |
| 4-6 yrs. | 7.4% (N=15) | 3.6% (N=24) |
| 7-9 yrs. | 14.4% (N=29) | 9.8% (N=65) |
| 10-12 yrs. | 36.6% (N=74) | 46.3% (N=306) |
| 2 yrs. coll. | 16.3% (N=33) | 16.8% (N=111) |
| 4 yrs. coll. | 11.4% (N=23) | 13.5% (N=89) |
| Grad. | 5.4% (N=11) | 5.4% (N=36) |
| Other | 5.4% (N=11) | 3.6% (N=24) |

Education distributions were compared among the various recreational fishermen. In contrast to findings in the income comparisons, we learned that each recreational fishing subpopulation (e.g., sound bank, sound boat, nearshore/offshore and Gulf Stream) distinctly represented a progression from least to most educated respectively. Figure 4.2 illustrates this relationship among the subpopulations with the use of a continuum.

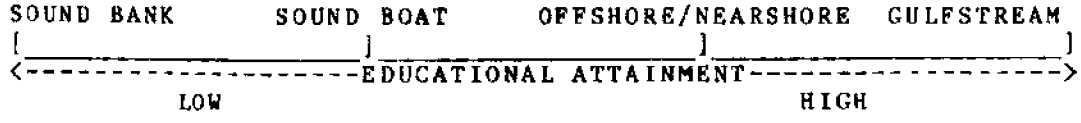



FIGURE 4.2. GENERAL DISTRIBUTION OF EDUCATIONAL ATTAINMENT AMONG TYPES OF RECREATIONAL FISHERMEN IN THE MARINE WATERS OF NORTH CAROLINA.

As was true with income, recreational fishermen in this study were better educated than the general populace of North Carolina. In 1981 and 1982, 69.7 percent of the bank and 82.0 percent of the boat fishermen had a high school education. This compares with the statewide figure of 54.8 percent. However, if we control for out-of-state fishermen, local bank fishermen have an education similar to the statewide populace. For example, for bank fishermen with a high school education, there were 55.0 percent in the Albemarle region, 51.0 percent in the Western Pamlico, and 66.7 percent in the Neuse River Region.

## Occupation

Types of employment opportunities in eastern North Carolina have an influence on the occupations of recreational fishermen. The sound region of eastern North Carolina is predominately rural. Most of the eastern half of the state is outside any Standard Metropolitan Statistical Area designation. Nevertheless, industries other than forestry, fishing and agriculture are moving to the area, providing opportunities for employment in nontraditional occupations.

Tables 4.6 and 4.7 give the distribution of occupations for 1981 and 1982 for boat and bank fishermen. No major difference exists between boat and bank fishermen with respect to occupational categories. There is, however, a difference in white-collar occupations. For bank fishermen in 1981 and 1982, 30.66 percent were employed in white-collar positions. This includes the occupational categories of professional, technical, managerial, clerical, sales, farmers and farm managers. Excluded were service occupations. In contrast, 47.32 percent of the boat fishermen were in the same category. Among bank fishermen in the Oregon Inlet area, white-collar workers accounted for 46.1 percent of the fishermen for both years. In Croatan/Roanoke Island area, 34.8 percent of the bank fishermen fell in this category. Other areas--the Albemarle complex, the western Pamlico and the Neuse River region--had a white-collar representation of 25.1 percent, 31 percent and 32 percent respectively. Bank fishermen in the Oregon Inlet and Croatan/Roanoke Island areas are more similar to boat fishermen occupationally than are bank fishermen in the remaining three regions.

Table 4.6. Occupations of recreational fishermen (1981 and 1982).

| | Boat | Cases | Adj. Frequencies |
|---|---|---|---|
| 1. | Professional, Technical, Managerial | 208 | 31.85% |
| 2. | Clerical and Sales | 51 | 7.81% |
| 3. | Craftsman and Kindred | 160 | 24.5% |
| 4. | Military (active) | 11 | 1.68% |
| 5. | Operatives (transportation nontransportation) | 46 | 7.04% |
| 6. | Laborers (except farm) | 14 | 2.14% |
| 7. | Farmers and Farm Managers | 50 | 7.66% |
| 8. | Farm Laborers | 1 | .15% |
| 9. | Service | 23 | 3.52% |
| 10. | Household Service | 4 | .61% |
| 11. | Student | 4 | .61% |
| 12. | Unemployed | 9 | 1.38% |
| 13. | Retired | 72 | 11.03% |
| | Total | 678 | 100.00 |

Table 4.7. Occupations of recreational fishermen (1981 and 1982).

| Bank | Cases | Adj. Frequencies |
|---|---|---|
| 1. Professional, Technical, Managerial | 47 | 23.62% |
| 2. Clerical and Sales | 8 | 4.02% |
| 3. Craftsmen and Kindred | 50 | 25.13% |
| 4. Military (active) | 7 | 3.52% |
| 5. Operatives (transportation and nontransportation) | 15 | 7.54% |
| 6. Laborers (except farm) | 7 | 3.52% |
| 7. Farmers and Farm Managers | 6 | 3.02% |
| 8. Farm Laborers | 3 | 1.51% |
| 9. Service | 9 | 4.52% |
| 10. Household/Service | 2 | 1.01% |
| 11. Students | 15 | 7.54% |
| 12. Unemployed | 11 | 5.53% |
| 13. Retired | 19 | 9.55% |
| Total | 203 | 100.00% |

In a comparison of traditional blue-collar occupations, the difference is not so dramatic. For bank fishermen, 37.7 percent can be characterized as blue collar. This category includes craftsmen, kindred workers, operatives (both tranportation and nontransportation), laborers and farm laborers. Again service occupations were excluded. For boat fishermen, 33.83 percent were employed in blue-collar occupations. The fact that more boat fishermen hold white-collar jobs is consistent with earlier findings about income and education. On average, white-collar occupations require more education and yield higher incomes.

In total, only 3.46 percent of the recreational fishermen were unemployed. This is less than national and state unemployment figures. Within this total, 5.53 percent of the bank fishermen were unemployed. In

contrast, 1.38 percent of the boat fishermen were unemployed. Retired persons accounted for about 10 percent of the total sample with boat and bank samples having 11.03 percent and 9.55 percent, respectively.

The number of retired recreational fishermen using the sounds of North Carolina will increase. The demographic "bulge" of the baby boomers will create a large elderly population beginning at the turn of the century. The short run increase, however, will result from more retired people moving from the north and northeast to the southeast.

## Gender

Recreational fishing is predominately a male activity. The two modes of fishing, however, differ with respect to female participation. Of those interviewed in 1981 and 1982, 95.4 percent of the boat fishermen and 82.9 percent of the bank fishermen were male (Table 4.8). A better understanding of the role of gender in fishing can be gained by looking at Tables 4.9 and 4.10. Among boat fishermen for both years, 63.9 percent of the fishing parties were exclusively male. In contrast, over half, or 56.9 percent, of the bank fishing parties had at least one female. Excusively female boat fishing parties were rare. In 1981 and 1982, only three parties or 0.4 percent of the sample were female. On the other hand, 8.5 percent of bank fishing parties sampled were exclusively female.

Table 4.8. Gender of Respondent.

| Boat | | Cases | Adjusted Frequency |
|---|---|---|---|
| | 1981 Male | 380 | 96.40% |
| | Female | 14 | 3.60% |
| | 1982 Male | 330 | 94.40% |
| | Female | 19 | 5.60% |
| | Total Male | 710 | 95.40% |
| | Female | 33 | 4.60% |
| Bank | | | |
| | 1981 Male | 107 | 79.90% |
| | Female | 27 | 20.10% |
| | 1982 Male | 68 | 88.30% |
| | Female | 9 | 11.70% |
| | Total Male | 175 | 82.90% |
| | Female | 36 | 17.10% |

Table 4.9. Total number of females in party.

| Boat # in pty | 1981 Cases | 1981 Adjusted Frequency | 1982 Cases | 1982 Adjusted Frequency | Total Adjusted Frequency |
|---|---|---|---|---|---|
| 0 | 261 | 69.0% | 182 | 58.3% | 63.9% |
| 1 | 78 | 20.6% | 66 | 21.2% | 20.5% |
| 2 | 33 | 8.7% | 44 | 14.1% | 11.7% |
| 3 | 6 | 1.6% | 18 | 5.8% | 3.6% |
| 4 | --- | ---- | 2 | 0.6% | 0.3% |
| Bank | | | | | |
| 0 | 57 | 43.2% | 33 | 44.6% | 43.7% |
| 1 | 45 | 34.1% | 27 | 36.5% | 35.0% |
| 2 | 17 | 12.9% | 6 | 8.1% | 11.2% |
| 3 | 9 | 6.8% | 5 | 6.8% | 6.8% |
| 4 | 3 | 2.3% | 3 | 4.1% | 2.9% |
| 6 | 1 | 0.8% | --- | ---- | 0.5% |

Table 4.10. Number of males in party.

| Boat # in pty | 1981 Cases | 1981 Adjusted Frequency | 1982 Cases | 1982 Adjusted Frequency | Total Adjusted Frequency |
|---|---|---|---|---|---|
| 0 | 2 | 0.5% | -- | -- | 0.3% |
| 1 | 97 | 25.7% | 58 | 18.6% | 22.8% |
| 2 | 169 | 44.7% | 137 | 43.9% | 44.3% |
| 3 | 83 | 22.0% | 82 | 26.3% | 23.9% |
| 4 | 22 | 5.8% | 26 | 8.3% | 7.0% |
| 5 | 4 | 1.1% | 4 | 1.3% | 1.2% |
| 6 | --- | --- | 3 | 1.0% | 0.4% |
| 7 | 1 | 0.3% | 2 | 0.6% | 0.4% |
| **Bank** | | | | | |
| 0 | 12 | 9.1% | 5 | 6.8% | 8.3% |
| 1 | 65 | 47.7% | 34 | 45.9% | 47.1% |
| 2 | 36 | 27.3% | 25 | 33.8% | 29.6% |
| 3 | 16 | 12.1% | 8 | 10.8% | 11.7% |
| 4 | 4 | 3.0% | 2 | 2.7% | 2.9% |
| 5 | 1 | 0.8% | --- | --- | 0.5% |

## Race

With respect to race, we found that 95.7 percent of the boat fishing parties were exclusively white. Black fishing parties accounted for 3.2 percent of the sample, and only 0.9 percent of the fishing parties were racially mixed (Table 4.11). Among bank fishermen, 24.5 percent of the parties were black. We found that bank parties are also rarely racially mixed (1.0 percent of the sample).

Table 4.11. Racial composition of party.

| | 1981 | 1982 | Total |
|---|---|---|---|
| Boat Fishermen | | | |
| White | 95.9%(N=378) | 95.4%(N=333) | 95.7%(N=711) |
| Black | 2.8%(N=11) | 3.7%(N=13) | 3.2%(N=24) |
| Eurasian | ---- | .3%(N=1) | .1%(N=1) |
| Mixed | 1.3%(N=5) | .6%(N=2) | .9%(N=7) |
| Bank | | | |
| White | 73.7%(N=98) | 74.7%(N=56) | 74.0%(N=154) |
| Black | 25.6%(N=34) | 22.7%(N=17) | 24.5%(N=51) |
| Chinese | 0.7%(N=1) | ----- | 0.5%(N=1) |
| Mixed | ----- | 2.7%(N=2) | 1.0%(N=2) |

The occurrence of black fishing parties among bank fishermen is representative of the general population of eastern North Carolina. As mentioned previously, most of eastern North Carolina lies outside the census bureau's SMSA. For these areas the percentage of blacks is 24.5 percent. For urban areas within this designation the percentage is 30.4 percent black and for rural areas, 22.3 percent (Table 4.12).

Table 4.12. Percent of Black Population Outside Standard Metropolitan Statistical Areas (SMSA)*.

| | % Black |
|---|---|
| Urban | 30.4% |
| Rural | 22.3% |
| Total | 24.5% |

*(Source: 1980 North Carolina Census of Population, Table 14; 35-7).

A region-by-region comparison of the racial composition of bank fishing parties was made. Black bank fishing parties were more frequent in three of the six regions studied. In 1981, black fishermen accounted for 44.4 percent of the parties in the Albemarle area, 6.8 percent in the Croatan/Roanoke Island area, 7.1 percent in the Oregon Inlet area, 40 percent in the western Pamlico, and 37.5 percent in the Neuse River area. For 1982, the percentages were 11.8 percent, 23.5 percent, 0 percent, 41.2 percent, and 23.5 percent, respectively. As is evident from Table 4.13, the counties within these regions have a large black population.

Table 4.13. Counties Bordering the Study Area by Race*.

| | % Black |
|---|---|
| Beaufort | 31.7 |
| Bertie | 59.2 |
| Camden | 32.2 |
| Carteret | 9.4 |
| Chowan | 41.5 |
| Craven | 27.5 |
| Dare | 6.2 |
| Hyde | 35.6 |
| Pamlico | 31.1 |
| Pasquotank | 36.5 |
| Perquimans | 37.8 |
| Tyrrell | 39.0 |
| Washington | 43.3 |

*(Source: 1980 North Carolina Census of Population, Table 14; 35-13).

## Age and Number of Years Sportfished

Table 4.14 shows the average age of fishermen. The average boat or bank fisherman is 40 to 45 years old. On average, a boat fisherman has fished 25 years; a bank fisherman, 23 years. Therefore, most fishermen have spent close to half of his or her life fishing (Table 4.15).

Table 4.14. Age of Fishermen.

| Boat | Cases | Mean | Median | S.D. | C.I.(.90) |
|---|---|---|---|---|---|
| 1981 | 393 | 42.57 | 40.24 | 11.79 | ± .97 |
| 1982 | 344 | 44.52 | 43.77 | 12.27 | ± 1.09 |
| Total | 737 | 43.48 | 41.77 | 12.05 | ± .73 |
| Bank | | | | | |
| 1981 | 131 | 39.66 | 37.00 | 15.84 | ± 2.28 |
| 1982 | 77 | 40.53 | 39.25 | 16.00 | ± 3.00 |
| Total | 208 | 39.98 | 38.50 | 15.85 | ± 1.80 |

Table 4.15. Number of years sportfished.

| Boat | Mean | Median | S.D. | C.I. |
|---|---|---|---|---|
| 1981 | 25.34 (N=373) | 24.53 | 16.86 | + 1.44 |
| 1982 | 24.91 (N=304) | 21.83 | 13.79 | + 1.30 |
| Total | 25.15 (N=677) | 22.31 | 15.55 | + .98 |
| Bank | | | | |
| 1981 | 24.67 (N=131) | 20.11 | 20.07 | + 2.89 |
| 1982 | 20.63 (N=73) | 16.38 | 14.26 | + 2.75 |
| Total | 23.23 (N=204) | 19.63 | 18.28 | + 2.11 |

## Avidity

Measuring an individual's desire to go fishing is not easy. Some fishermen would like to fish every day, but others are happy to fish once or twice a month. The actual desire to fish and the number of times an individual fishes may not be related because of time and money constraints. However, the only means for measuring any such desire is the number of times an individual fished during the last year. It is assumed that a fisherman's avidity is one objective measure of his/her desire to go fishing.

Boat and bank anglers fished an average of 35.77 and 41.49 days respectively. It seems that bank fishermen fish more often than boat fishermen. In a previous section, avidity was checked against income to see if lower income people fished more often to provide supplemental protein. Boat and bank fishermen were compared with respect to number of times fished last year, controlling for region fished (selecting regions that are dominated by local fishermen). We could not with any confidence claim that the avidity of boat and bank fishermen was statistically different. Within this comparison, boat anglers fished an average of 39.62 days; bank fishermen, 45.79 days.

Table 4.16. Fishermen's Avidity.

| | | Mean | S.D. | C.I. |
|---|---|---|---|---|
| Boat | | | | |
| | 1981 | 38.72 (N=364) | 47.53 | ±4.09 |
| | 1982 | 32.15 (N=296) | 41.97 | ±4.01 |
| | Total | 35.77 (N=660) | 45.21 | ±2.90 |
| Bank | | | | |
| | 1981 | 41.20 (N=124) | 65.24 | ±9.64 |
| | 1982 | 41.99 (N=77) | 63.89 | ±12.39 |
| | Total | 41.49 (N=196) | 64.58 | ±6.85 |

## Boats and Their Characteristics

The largest investment a recreational fishermen can make is a boat. In characterizing the boats observed in this study, we found the average sound fishing boat was 17.47 feet long. It was made of fiberglass and carried a 101-horsepower outboard motor. It is 7.5 years old (Table 4.17 through 4.24). These characteristics are representative of the need for a light, trailerable boat that can be used at the numerous ramps. In Table 4.21, 87 percent of the boats were constructed of fiberglass, 7 percent of wood, 5.4 percent of aluminum, and 0.4 percent of fiberglass over wood. Most motors were single outboards (79.2 percent). Of the other motor types, 16.5 percent had inboard/outboards, 1.1 percent no motors, .5 percent inboard motors, and .5 percent twin outboards. Of those fishermen interviewed, 87.5 percent owned the boat they were using, 6.5 percent borrowed the boat from friends or relatives, 3.7 percent of the boats were owned by someone in the party other than the interviewee, 1.4 percent were jointly owned, and .9 percent were leased or rented.

Table 4.17. Ownership of Boats Other Than One in Use.

| | Cases | Adj. Freq. |
|---|---|---|
| Yes | 232 | 36.14% |
| No | 472 | 63.86% |
| | 739 | |

Table 4.18. Use of Boat Other Than One in Use.

| | Cases | Adjusted Frequency |
|---|---|---|
| Recreational Fishing | 232 | 86.9% |
| Other Recreational Activity | 35 | 13.1% |
| | 267 | |

Table 4.19. Interviewees Relationship to Boat in Use for 1981 and 1982.

| | Cases | Adjusted Frequency |
|---|---|---|
| 1. Owner | 621 | 87.5% |
| 2. Borrowed from friend/relative | 44 | 6.5% |
| 3. Rental/leased | 4 | 0.9% |
| 4. Owned by other member of party | 24 | 3.7% |
| 5. Owned jointly | 8 | 1.4% |
| | 712 | |

Table 4.20. Boat In-Use Characteristics for 1981 and 1982.

| | Mean | Median | S.D. | C.I.(.90) |
|---|---|---|---|---|
| Length | 17.47 (N=740) | 17.18 | 2.63 | ±.16 |
| Horsepower | 100.99 (N=727) | 90.27 | 60.25 | ±3.68 |

Table 4.21. Boat Characteristics for 1981 and 1982.

| Type | Cases | Adjusted Frequency |
|---|---|---|
| Fiberglass 1 | 648 | 87.0% |
| Wood 2 | 52 | 7.0% |
| Aluminum 3 | 40 | 5.4% |
| Wood/fiberglass 6 | 2 | .4% |
| Other 8 | 2 | .4% |
| Motor | 744 | |
| No Motor 0 | 8 | 1.1% |
| Outboard 1 | 591 | 79.4% |
| Inboard/outboard 2 | 123 | 16.5% |
| Inboard 3 | 18 | 2.4% |
| Twin Outboard 4 | 3 | 0.4% |
| Other 7 | 1 | .1% |
| | 743 | |

Table 4.22. Characteristics of Second and Third Boat Owned for 1981 and 1982.

| | Mean | Median | S.D. |
|---|---|---|---|
| Length of boat 1 | 15.6 (N=240) | 14.7 | 4.2 |
| Length of boat 2 | 14.4 (N=45) | 14.1 | 2.7 |
| Horsepower boat 1 | 57.5 | 30.3 | 67.1 |
| Horsepower boat 2 | 50.7 | 24.6 | 67.9 |

Table 4.23. Age of Boat Used and Boat 1 from Table 4.22 for 1981 and 1982.

| | Mean | Median | S.D. |
|---|---|---|---|
| Age of boat in use | 7.5 | 6.2 | 6.0 |
| Age of Boat 1 | 9.5 | 8.0 | 6.6 |

Table 4.24. Motor Types of Boats Other Than One in Use.

| Type | Cases | Adjusted Frequency |
|---|---|---|
| Outboard 1 | 179 | 85.2 |
| Inboard/outboard 2 | 16 | 7.6 |
| Inboard 3 | 8 | 3.8 |
| Other 7 | 7 | 3.3 |
| | 210 | |

Often a fisherman will own more than one boat. This is particularly true if a fisherman participates in more than one type of fishing (e.g., freshwater fishing, offshore fishing, etc.). Of those interviewed, 36.14 percent owned more than one boat (Table 4.17). Although these second boats may be used for a variety of activities, only 13.1 percent of the boats were specifically used for another purpose (Table 4.18). The average length of these boats, 15.6 feet for the primary boat and 14.4 feet for the second (Table 4.22), suggests that secondary craft are used for freshwater fishing. The average horsepower of the primary and secondary boat, 57.5 and 50.7 respectively, also supports this hypothesis (Table 4.22). These

second boats tend to be two years older (9.5 years old) than the primary boat (Table 4.23). The majority of these secondary craft, 85.2 percent, have a single outboard. Inboard/outboards accounted for 7.6 percent of the sample; inboard motors and other types, 3.8 percent and 3.3 percent, respectively (Table 4.24). Other types include boats propelled by sail or oars.

## Investment in the Fishing Enterprise

Boats require not only a major initial investment but also a long-term commitment to maintain the boat and its equipment and to protect it from the harsh marine environment. Boat fishermen in this study were asked to estimate the amount of money they spent last year on new equipment for the boat, launching, storing or mooring, and maintenance. During 1981 and 1982, respondents average investment in boat gear was $244.88 (Table 4.25). This estimate, however, can not be taken as a typical expenditure since 50.4 percent of the respondents spent nothing on new gear the previous year. At the high end, 26.6 percent of the respondents spent more than $100 and 6.1 percent spent more than $1000 in the previous year.

Similarly, costs of launching, storing or mooring a boat during the previous year were low, with 58.2 percent of the respondents having no expenditures. The average total expenditure was $32.09 (Table 4.26). Only 4.7 percent of the total costs for launching or boat storage were $100 or more.

Few fishermen were able to escape the costs of boat maintenance. The average yearly maintenance cost was $148.99 (Table 4.27). Only 33.8 percent of the fishermen spent no money to maintain their boat and 35.1 percent spent $100 or more.

Table 4.25. Investment in Boat Gear for Previous Year.

| | Mean | Median | S.D. | C.I. |
|---|---|---|---|---|
| 1981 | $226.65 (N=362) | 0.45 | 605.01 | ± 52.30 |
| 1982 | 267.09 (N=297) | 15.75 | 842.00 | ± 80.39 |
| Total | 244.88 (N=659) | .49 | 721.06 | ± 46.21 |

Table 4.25.1. Total Expenses for Boat Gear, Maintenance and Storage for the Previous Year (boat only).

| | Mean | Median | S.D. | C.I. |
|---|---|---|---|---|
| 1981 | $368.90 (N=378) | $100.28 | $752.75 | ± 63.70 |
| 1982 | $447.49 (N=312) | $149.75 | $959.58 | ± 89.38 |
| Total | $404.44 (N=690) | $120.50 | $852.76 | ± 53.40 |

Table 4.26. Total Spent Last Year on Launching, Storing or Moving Boat.

| | Mean | Median | S.D. | C.I. |
|---|---|---|---|---|
| 1981 | 27.05 (N=359) | .37 | 95.68 | ± 8.39 |
| 1982 | 38.17 (N=297) | .34 | 350.83 | ± 33.49 |
| Total | 32.09 (N=656) | .36 | 246.29 | ± 15.82 |

Table 4.27. Cost of Maintaining Boat for Previous Year.

| | Mean | Median | S.D. | C.I. |
|---|---|---|---|---|
| 1981 | 134.70 (N=354) | 29.90 | 285.49 | ± 24.97 |
| 1982 | 166.25 (N=293) | 74.67 | 301.27 | ± 28.95 |
| Total | 148.99 (N=647) | 49.82 | 292.93 | ± 18.94 |

Fishermen also were asked to estimate the amount of money spent in the previous year on fishing equipment and related gear (e.g., ice chests, tackle boxes, etc.). The majority of boat fishermen spent money on new or replacement hook-and-line equipment. Only 10.6 percent of the fishermen spent nothing. The average expenditure was $160.08, with 28.4 percent of the fishermen spending $100 or more. In contrast, bank fishermen averaged less spending -- $63.05 -- on new or replacement hook-and-line equipment. Among these fishermen, 15.7 percent spent nothing and 15.7 percent had spent $100 or more (Table 4.28).

Table 4.28. Investment in New and Replacement Fishing Gear for Last Year (1981 and 1982).

| | Mean | Median | S.D. | C.I. |
|---|---|---|---|---|
| **Hook and line gear** | | | | |
| Boat | $160.08 (N=669) | $ 50.28 | $541.82 | ± 34.45 |
| Bank | $ 63.05 (N=204) | $ 25.19 | $ 96.24 | ± 11.09 |
| **Nets and related gear** | | | | |
| Boat | $ 31.43 (N=677) | $ .07 | $287.86 | ± 18.20 |
| Bank | $ 3.27 (N=205) | $ 0.05 | $ 22.41 | ± 2.57 |
| **Rakes, tongs, flounder gigs and lights** | | | | |
| Boat | $ 5.36 (N=677) | $ 0.05 | $ 36.64 | ± 2.32 |
| Bank | $ 2.98 (N=205) | $ 0.06 | $ 14.45 | ± 1.66 |
| **Other gear (e.g., ice chests, tackle boxes)** | | | | |
| Boat | $ 26.43 (N=676) | $ 0.36 | $ 61.62 | ± 3.90 |
| Bank | $ 15.85 (N=203) | $ 0.39 | $ 48.81 | ± 5.64 |

Table 4.28.1. Fishermen's Total Investment in Gear.

| | Mean | Median | S.D. | C.I. |
|---|---|---|---|---|
| **Boat** | | | | |
| 1981 | $221.48 (N=378) | $99.95 | $585.11 | ± 49.51 |
| 1982 | $212.06 (N=312) | $75.21 | $763.16 | ± 71.09 |
| Total | $217.22 (N=690) | $96.50 | $671.00 | ± 42.02 |
| **Bank** | | | | |
| 1981 | $81.34 (N=132) | $34.70 | $122.72 | ± 17.57 |
| 1982 | $89.51 (N=74) | $35.50 | $143.27 | ± 27.40 |
| Total | $84.28 (N=206) | $35.10 | $130.51 | ± 14.96 |

Fishermen estimated how much they spent last year on nets and related gear. Boat fishermen averaged spending $31.43 for nets and related gear. However, 87.1 percent of fishermen spent nothing on nets or related gear. Similarly, few bank fishermen spent anything for this type of gear, and 90.2 percent spent nothing the previous year. The average expenditure for bank fishermen was $3.27 (Table 4.25).

Fishermen also estimated the amount spent last year on rakes, tongs, and flounder gigs. Of those fishermen responding, 89.8 percent of the bank and 91.1 percent of the boat fishermen spent nothing for this type of gear in the previous year. The average expenditure for boat fishermen was $5.36 and for bank fishermen $2.98.

Additionally, fishermen estimated how much they spent for other types of gear and equipment, including ice chests, tackle boxes, rain gear, etc. The average expenditure for boat fishermen was $26.43, with 57.8 percent spending nothing and 4.4 percent spending $100 or more. Bank fishermen averaged $15.85 on such expenditures. More than half of these fishermen (56.2 percent) spent nothing on this type of gear, and only 1.5 percent spent $100 or more.

## A Fisherman's Residence

A fisherman's place of residence is important in understanding the local or nonlocal character of a recreational fishery. Tables 4.29.1 and 4.29.2 shows the percentage of fishermen that are residents of counties within a three-county radius of the study area. More bank fishermen (68.7 percent) tended to live within this three-county radius than boat fishermen (52.10 percent). And 45.2 percent of the bank fishermen and 28.48 percent of the boat fishermen were from counties bordering the sounds under study. It is clear that bank fishermen tend to be more localized in their fishing activity than boat fishermen.

Table 4.29.1 Percent of Boat Fishermen from Coastal Counties

| County | % Resident |
|---|---|
| Beaufort | 4.8 |
| Bertie | 8.2 |
| Camden | 0.9 |
| Carteret | 1.2 |
| Chowan | 4.0 |
| Craven | 2.9 |
| Dare | 3.9 |
| Hyde | 0.3 |
| Pamlico | 0.9 |
| Pasquotank | 5.9 |
| Perquimans | 0.5 |
| Tyrrell | 0.9 |
| Washington | 4.0 |

Note: 28.48 percent are from marine counties; 52.10 percent are from counties not more than two counties away from marine waters.

Table 4.29.2 Percent of Bank Fishermen from Coastal Counties

| County | % Resident |
|---|---|
| Beaufort | 9.1 |
| Bertie | 4.8 |
| Camden | 1.4 |
| Carteret | 1.9 |
| Chowan | 7.7 |
| Craven | 9.5 |
| Dare | 8.1 |
| Hyde | 3.4 |
| Pamlico | 3.5 |
| Pasquotank | 2.4 |
| Perquimans | 0 |
| Tyrrell | 0 |
| Washington | 2.9 |

Note: 45.2 percent of bank fishermen are from marine counties; 68.7 percent of bank fishermen are from counties not more than two counties away from marine waters.

Tables 4.29 and 4.30 show the states where the fishermen surveyed resided. Surprisingly, during 1981 and 1982 more bank fishermen were from out-of-state than boat fishermen. In 1981, 89.9 percent of the boat fishermen were from North Carolina; 73.5 percent of the bank fishermen were state residents. In 1982, 79.7 percent of the boat fishermen and 51.4 percent of the bank fishermen were North Carolina residents.

The majority of the out-of-state boat and bank anglers fished the Croatan/Roanoke and Oregon Inlet area. In 1981, 19.8 percent of the out-of-state bank fishermen were interviewed in the Croatan/Roanoke Island area. This percentage rises to 23.6 percent with the inclusion of the Oregon Inlet area. In 1981, 10.1 percent of the boat fishermen were from out-of-state. Of these fishermen, 7.2 percent were interviewed in the Croatan/Roanoke Island, Oregon Inlet, and eastern Pamlico/Outer Banks areas. The vast majority (6.5 percent) were from Virginia.

In 1982, the number of out-of-state bank fishermen was much larger. Again this occurred because sampling concentrated in the Croatan/Roanoke Island and Oregon Inlet area, which is fished by more out-of-state anglers. Out-of-state fishermen in the Croatan/Roanoke Island and Oregon Inlet areas accounted for 41.9 percent of the cases. For boat fishermen in 1982, the following percentage of the anglers surveyed were North Carolinians: 100 percent in the Albemarle area, 94.1 percent in the Croatan/Roanoke Island area, 71.0 percent in the Oregon Inlet area, 100 percent in the western Pamlico area, 100 percent in the Neuse River area and 66.7 percent in the eastern Pamlico/Outer Banks area.

Table 4.29. State Residence of Fishermen, 1982.

| State | Cases | % Adj. Freq. |
|---|---|---|
| Boat Fishermen 1982 | | |
| North Carolina | 248 | 79.7 |
| Virginia | 40 | 12.9 |
| Maryland | 7 | 2.3 |
| Pennsylvania | 3 | 1.0 |
| South Carolina | 3 | 1.0 |
| Florida | 2 | 0.6 |
| New Jersey | 2 | 0.6 |
| Wisconsin | 2 | 0.6 |
| West Virginia | 1 | 0.3 |
| Delaware | 1 | 0.3 |
| New York | 1 | 0.3 |
| Ohio | 1 | 0.3 |
| | 311 | 100 |
| Bank Fishermen 1982 | | |
| North Carolina | 38 | 51.4 |
| Virginia | 15 | 20.3 |
| Pennsylvania | 6 | 8.1 |
| Ohio | 4 | 5.4 |
| Maryland | 3 | 4.1 |
| Florida | 2 | 2.7 |
| New York | 2 | 2.7 |
| California | 1 | 1.4 |
| Washington D.C. | 1 | 1.4 |
| New Jersey | 1 | 1.4 |
| Oregon | 1 | 1.4 |
| | 74 | 100 |

Table 4.30. State Residence of Fishermen, 1981.

| State | Cases | % Adj. Freq. |
|---|---|---|
| Boat Fishermen 1981 | | |
| North Carolina | 338 | 89.9 |
| Virginia | 24 | 6.5 |
| Ohio | 2 | 0.6 |
| Montana | 2 | 0.6 |
| Washington D.C. | 1 | 0.3 |
| Maryland | 3 | 0.8 |
| New York | 1 | 0.3 |
| Pennsylvania | 1 | 0.3 |
| Tennessee | 1 | 0.3 |
| West Virginia | 1 | 0.3 |
| | 375 | 100 |
| Bank Fishermen 1981 | | |
| North Carolina | 97 | 73.5 |
| Virginia | 13 | 9.8 |
| Pennsylvania | 4 | 3.0 |
| Maryland | 3 | 2.4 |
| Connecticut | 2 | 1.6 |
| New Jersey | 2 | 1.6 |
| Ohio | 3 | 2.4 |
| Delaware | 1 | 0.9 |
| Alabama | 1 | 0.9 |

Virginia residents accounted for 12.38 percent of the out-of-state fishermen. Pennsylvania anglers accounted for 3.1 percent; and Maryland, 2.1 percent. Fishermen also traveled from Ohio, New Jersey and New York.

The majority of fishermen in North Carolina are residents. Boat fishermen, in particular, tend to be residents. Most of the fishing by nonresidents occurs in the Roanoke Island/ Croatan Sound area and on the Outer Banks. In recognizing this regional variation, it becomes apparent that there are two types of bank fishermen in this study. First, there are the local bank fishermen who frequent the Albemarle, western Pamlico, and Neuse River areas. Second, there are the nonresident bank anglers who fish the heavy tourist areas of the Outer Banks and the Roanoke Island/Croatan Sound.

## The Fishing Party

An important aspect of any fishing trip relates to fishing companions. This section will provide information on the gender and age composition of the fishing party and will explore the relationships between members of a fishing party.

As noted previously, females are more prevalent among bank fishing parties than among boat parties. Tables 4.31 through 4.38 give the number of males and females in a party by age groups. Female fishermen in boat and bank parties tend to be 30 to 49 years old. Statistics revealed 20.1 percent of the boat parties and 23.7 percent of the bank fishing parties had at least one female between these ages. Similarly, 65.2 percent of the men in boat parties and 42.2 percent in bank fishing parties were in this age bracket.

Table 4.31. Number of Female Children 0 to 15 Years of Age.

| Boat Number | 1981 Cases | 1981 % Adjusted Freq. | 1982 Cases | 1982 % Adjusted Freq. | Total % Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 375 | 94.9 | 319 | 91.1 | 93.2 |
| 1 | 15 | 3.8 | 25 | 7.1 | 5.4 |
| 2 | 5 | 1.3 | 6 | 1.7 | 1.5 |
| Bank | | | | | |
| 0 | 116 | 86.6 | 71 | 92.2 | 88.6 |
| 1 | 13 | 9.7 | 3 | 3.9 | 7.6 |
| 2 | 3 | 2.2 | 3 | 3.9 | 2.8 |
| 3 | 1 | 0.7 | ---- | ---- | 0.5 |
| 4 | 1 | 0.7 | ---- | ---- | 0.5 |

Table 4.32. Number of Female Young Adults Age 16 to 29 yrs.

| Boat Number | 1981 Cases | 1981 % Adjusted Freq. | 1982 Cases | 1982 % Adjusted Freq. | Total % Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 356 | 90.1 | 311 | 88.9 | 89.5 |
| 1 | 32 | 8.1 | 31 | 8.9 | 8.5 |
| 2 | 7 | 1.8 | 8 | 2.3 | 2.0 |
| Bank | | | | | |
| 0 | 115 | 85.8 | 60 | 77.9 | 82.9 |
| 1 | 15 | 11.2 | 13 | 16.9 | 13.3 |
| 2 | 3 | 2.2 | 3 | 3.9 | 2.8 |
| 3 | 1 | 0.7 | 1 | 1.3 | 0.9 |

Table 4.33. Number of Female Middle-Aged Adults Age 30 to 49 yrs.

| Boat Number | 1981 Cases | 1981 Adjusted Freq. | 1982 Cases | 1982 Adjusted Freq. | Total Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 335 | 84.8% | 261 | 74.6% | 80.0% |
| 1 | 54 | 13.7% | 71 | 20.3% | 16.8% |
| 2 | 6 | 1.5% | 16 | 4.6% | 3.0% |
| 3 | ___ | ___ | 2 | 0.6% | 0.3% |
| Bank | | | | | |
| 0 | 104 | 77.6% | 57 | 74.0% | 76.3% |
| 1 | 24 | 17.9% | 19 | 24.7% | 20.4% |
| 2 | 6 | 4.5% | 1 | 1.3% | 3.3% |

Table 4.34. Number of Female Older Adults.

| Boat Number | 1981 Cases | 1981 Adjusted Freq. | 1982 Cases | 1982 Adjusted Freq. | Total Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 365 | 92.4% | 308 | 88.0% | 90.3% |
| 1 | 25 | 6.3% | 33 | 9.4% | 7.8% |
| 2 | 5 | 1.3% | 9 | 2.6% | 1.9% |
| Bank | | | | | |
| 0 | 102 | 76.1% | 64 | 83.1% | 78.7% |
| 1 | 28 | 20.9% | 10 | 13.0% | 18.0% |
| 2 | 2 | 1.5% | 2 | 2.6% | 1.9% |
| 3 | 1 | 0.7% | — | — | 0.9% |
| 4 | 1 | 0.7% | — | — | 0.5% |

Table 4.35. Number of Male Children Age 0 to 15 Years.

| Boat Number | 1981 Cases | 1981 Adjusted Freq. | 1982 Cases | 1982 Adjusted Freq. | Total Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 334 | 84.6% | 283 | 80.9% | 82.8% |
| 1 | 45 | 11.4% | 52 | 14.9% | 13.0% |
| 2 | 14 | 3.5% | 12 | 3.4% | 3.5% |
| 3 | 2 | 0.5% | 2 | 0.6% | 0.5% |
| Bank | | | | | |
| 0 | 98 | 73.1% | 62 | 80.5% | 75.8% |
| 1 | 26 | 19.4% | 12 | 15.6% | 18.0% |
| 2 | 9 | 6.7% | 3 | 3.9% | 5.7% |
| 3 | -- | -- | -- | -- | -- |
| 4 | 1 | 0.7% | -- | -- | 0.5% |

Table 4.36. Number of Young Adult Males Age 16 to 29 Years.

| Boat | 1981 Cases | 1981 Adjusted Freq. | 1982 Cases | 1982 Adjusted Freq. | Total Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 277 | 70.1% | 247 | 70.6% | 70.3% |
| 1 | 80 | 20.3% | 66 | 18.9% | 19.6% |
| 2 | 34 | 8.6% | 29 | 8.3% | 8.5% |
| 3 | 4 | 1.0% | 6 | 1.7% | 1.3% |
| 4 | -- | -- | 2 | 0.6% | 0.3% |
| **Bank** | | | | | |
| 0 | 94 | 70.1% | 49 | 63.6% | 67.8% |
| 1 | 34 | 25.4% | 21 | 27.3% | 26.1% |
| 2 | 4 | 3.0% | 5 | 6.5% | 4.3% |
| 3 | 2 | 1.5% | 2 | 2.6% | 1.9% |

Table 4.37. Number of Middle-Aged Adults Age 30 to 49 Years.

| Boat Number | 1981 Cases | 1981 Adjusted Freq. | 1982 Cases | 1982 Adjusted Freq. | Total Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 141 | 35.7% | 118 | 33.7% | 34.8% |
| 1 | 153 | 38.7% | 132 | 37.7% | 38.3% |
| 2 | 79 | 20.0% | 81 | 23.1% | 21.5% |
| 3 | 16 | 4.1% | 13 | 3.7% | 3.9% |
| 4 | 4 | 1.0% | 6 | 1.7% | 1.3% |
| 5 | 1 | 0.3% | -- | -- | 0.1% |
| 6 | -- | -- | -- | -- | -- |
| 7 | 1 | 0.3% | -- | -- | 0.7% |
| Bank | | | | | |
| 0 | 80 | 59.7% | 42 | 54.5% | 57.8% |
| 1 | 43 | 32.1% | 29 | 37.7% | 34.1% |
| 2 | 9 | 6.7% | 6 | 7.8% | 7.1% |
| 3 | 2 | 1.5% | -- | -- | 0.9% |

Table 4.38. Number of Older Adult Males Age 50 Plus Years.

| Boat Number | 1981 Cases | 1981 Adjusted Freq. | 1982 Cases | 1982 Adjusted Freq. | Total Adjusted Freq. |
|---|---|---|---|---|---|
| 0 | 248 | 62.8% | 197 | 56.3% | 59.7% |
| 1 | 101 | 25.6% | 98 | 28.0% | 26.7% |
| 2 | 35 | 8.9% | 41 | 11.7% | 10.2% |
| 3 | 8 | 2.0% | 12 | 3.4% | 2.7% |
| 4 | 3 | 0.8% | 2 | 0.6% | 0.7% |
| Bank | | | | | |
| 0 | 95 | 70.9% | 58 | 75.3% | 72.5% |
| 1 | 35 | 26.1% | 16 | 20.8% | 24.2% |
| 2 | -- | -- | 3 | 3.9% | 3.3% |

The number of people in a fishing party was similar for both modes of fishing (Table 4.39). Bank fishermen averaged 2.48 fishermen per party. Boat fishermen averaged 2.77 persons per party.

Table 4.39. Average Number in Fishing Party.

| | Cases | Mean | S.D. |
|---|---|---|---|
| Boat | | | |
| 1981 | 378 | 2.54 | 1.11 |
| 1982 | 312 | 3.05 | 1.27 |
| Total | 690 | 2.77 | 1.20 |
| Bank | | | |
| 1981 | 132 | 2.49 | 1.47 |
| 1982 | 74 | 2.46 | 1.35 |
| Total | 206 | 2.48 | 1.42 |

Many social science theories have acknowledged the importance of work in influencing people's beliefs, attitudes and actions both inside and outside the work place. Since recreational fishing is a major nonwork activity in eastern North Carolina, questions relating to work and party composition were asked. In 1982, respondents classified their relationships with fishing companions based on categories of kinship, friends from work, friends of the same occupation, and friends of another kind.

Among boat fishermen, 9.96 percent of the parties had at least one friend from work, 6.55 percent had at least one friend of the same occupation, and 50.73 percent of the fishing parties had at least one friend not work or occupationally related. Bank fishermen tended to have fewer work related relationships. Consequently, 4.16 percent of the parties had at least one friend from work, 5.63 percent had at least one friend of the same occupation, and 27.11 percent at least one friend not work related (Table 4.40).

Table 4.40. Nonkinship Relationships Among Members of a Fishing Party for Boat and Bank (1982).

| | No. of Cases | Percent |
|---|---|---|
| Boat | | |
| Friends from work | 28 | 9.96% |
| Friends of the same occupation | 19 | 6.55% |
| Friends/other | 104 | 50.73% |
| Bank | | |
| Friends from work | 3 | 4.16% |
| Friends of the same occupation | 4 | 5.63% |
| Friends/other | 16 | 2 |

It is difficult to ascertain the total impact of work and occupational identity on the choice of fishing companions. Many kinship relationships, in particular those of a secondary nature (e.g., cousins), may be influenced by an individual's work and occupational experience (i.e., one may go fishing with a cousin from work or of the same occupation). Nevertheless, the fishermen in this study did not choose fishing partners entirely from their occupation or work. Bank fishermen, in particular, did not choose partners based on occupation, work or even friendship. Most fishing companions were chosen because of kinship ties. These include consanguineal, affinal, and fictive ties.

As fishermen were interviewed, the respondent was asked if any other members of the fishing party were related to him (her). And respondents were asked to specify exactly what those ties were. For example, responses such as uncle or cousin were not appropriate because they did not accurately describe the relationship.

Of the 736 boat fishing parties for which interviews were returned, 444 of the parties were kin-based. This represented 60.3 percent of the sample. In turn, 432 cases were analyzed for kinship links comprising the party. It was found that 275 of the parties were composed of people from the same nuclear family. The other 157 cases included extended kinsmen. Although members of a nuclear family might also be present.

The most often occurring nuclear family fishing party centered around a husband and wife. There were 104 cases of a husband and wife forming the core of the party, and in 25 of these cases, friends accompanied the couple. Next in frequency came parties made up of a father and one or more of his male or female offspring. There were 58 cases of this type of party. In 11 cases, friends accompanied these kinsmen. There were 18 cases of two or more brothers fishing together. In eight cases, friends accompanied the brothers. In Table 4.41, a breakdown of these types of kin-based parties is presented.

An interesting relationship emerges if the fishing parties are examined in light of kinship ties and the inclusion of friends. Same generation consanguineal-based parties (i.e., brother/brother) most often included friends (44 percent). Two-generation, consanguineal-based parties (i.e., father/offspring) had friends in the party in 34 percent of the reported cases. For same generation affinal kinsmen in the same nuclear family (i.e., husband/wife), only 24 percent of the parties included friends. In nuclear family parties unit made up of two generations and including both affinal and consanguineal ties (i.e., husband/wife/offspring), only 19 percent of the cases included friends. Lastly, parties composed of kinsmen outside one nuclear family unit (whether or not living together at the time of the activity) with various combinations of affinal, consanguineal and fictive links (i.e., extended kin parties), the presence of friends occurred in only 15 percent of the cases.

In summary, as kinship links change from consanguineal bonds in the same (at some time) nuclear family to extended kin based on both consanguineal and/or affinal ties, the lesser the likelihood that friends would be included in fishing party. (The Chi-Square statistic of these distributions was found to be significant at the 0.01 level.)

Table 4.41
Kin-Based Fishing Parties, Boat Fishing 1981-1982

| Type of Kin Relation Based Party | Total With Friends | Total W/O Friends | N= |
|---|---|---|---|
| Brother/Brother | 8 | 10 | 18 |
| Ego/Offspring | 32 | 63 | 95 |
| Husband/Wife | 25 | 76 | 104 |
| Husband/Wife/Offspring | 11 | 47 | 58 |
| Extended Kinsmen | 23 | 134 | 157 |

Table 4.42
Party Total Means Kin-Based Fishing Parties, Boat Fishing

| Type of Kin Relation Based Party | With Friend Mean | W/Out Friend Mean |
|---|---|---|
| Brother/Brother | 4.0 | 2.3 |
| Ego/Offspring | 3.7 | 2.4 |
| Husband/Wife | 4.0 | 2.0 |
| Husband/Wife/Offspring | 5.4 | 3.6 |
| Extended Kinsmen | 4.2 | 3.3 |

# CHAPTER 5
# CHARACTERISTICS OF THE FISHING TRIP

## Introduction

This chapter describes the general characteristics of a recreational fishing trip. As discussed previously, the duration of a fishing trip could be one day or more. Characteristics (e.g., expenses) were collected for the entire trip and not just the day of the interview. In addition, certain characteristics of the fishing trip represent activity by all members of the fishing party rather than just the person interviewed. These include expenses, fishing gear types in use, and creel data.

As in Chapter 4, two general categories of fishermen are described with respect of their characteristics: boat fishing parties and bank fishing parties. Boat fishing parties (one member of which was interviewed) used a boat in that day's fishing activities. In all cases, these interviews took place at access points (e.g., ramps) at the end of that day's fishing.

Bank fishing parties did not use a boat in that day's fishing. These interviews took place at bridges, fishing piers, private docks or shoreline beaches. Unlike the boat fishing interviews, most of the bank fishing interviews took place during the day's fishing activities rather than at the end. This presents certain problems in interpreting the results of the interview and will be discussed later. The total number of bank fishing interviews for 1981 and 1982 was 211. The total number of boat fishing interviews was 746.

TABLE 5.1
Total Number of Interviews Bank Fishing Parties 1981 and 1982

| | 1981 | 1982 | TOTAL |
|---|---|---|---|
| BANK FISHING PARTIES | 134 | 77 | 211 |

Table 5.2
Total Number of Interviews Boat Fishing Parties 1981 and 1982

| | | | |
|---|---|---|---|
| BOAT FISHING PARTIES | 396 | 350 | 746 |

## Distance Traveled to Fishing Site

Anglers fishing the sounds of North Carolina seldom live adjacent to those waters. For boat fishermen, it was found that the mean distance

traveled to the fishing site was 112 miles. When distance traveled is viewed by region, two distinct groups become obvious. For the Albemarle, western Pamlico and Neuse River regions, the mean distance traveled by boat fishing parties ranged from 30 to 80 miles (see Table 5.4). For the Croatan/Roanoke, Oregon Inlet and eastern Pamlico regions, the mean distance ranged from 130 to 220 miles (see Table 5.4). This difference in distance traveled is linked to substantial differences in trip expenditures between the two groups.

The mean distance traveled for bank fishing parties was 174 miles. The Albemarle, western Pamlico and Neuse River had average distances ranging from 40 to 60 miles. However, the mean distances for the other three regions ranged from 205 miles for the eastern Pamlico to 298 miles for Oregon Inlet. As with the boat fishing parties, these differences in distance traveled are reflected in the overall trip expenditures recorded.

Table 5.3
Distance Traveled to Fishing Site/Bank Fishing Parties 1981 - 1982

| Region | Mean Distance | S.D. | C.I. | N= |
|---|---|---|---|---|
| Albemarle | 37.0 | 91.0 | ±27.33 | 30 |
| Croatan/Roanoke | 294.8 | 240.1 | ±44.72 | 78 |
| Oregon Inlet | 298.2 | 268.8 | ±90.26 | 24 |
| Western Pamlico | 59.2 | 94.0 | ±23.05 | 45 |
| Neuse River | 60.2 | 158.3 | ±52.08 | 25 |
| Eastern Pamlico | 205.3 | 174.6 | ±165.83 | 3 |
| Totals | 175.9 | 225.6 | ±25.92 | 205 |

(*A. Confidence interval (C.I.) calculated at 0.9 level)

Table 5.4
Distance Traveled to Fishing Site/Boat Fishing Parties 1981 - 1982

| Region | Mean | St.Dev. | C.I. | N= |
|---|---|---|---|---|
| Albemarle | 47.1 | 66.3 | ±7.54 | 209 |
| Croatan/Roanoke | 144.7 | 89.5 | ±24.89 | 35 |
| Oregon Inlet | 177.7 | 142.7 | ±15.18 | 239 |
| Western Pamlico | 90.3 | 76.8 | ±11.30 | 125 |
| Neuse River | 37.1 | 32.0 | ±11.22 | 22 |
| Eastern Pamlico | 227.2 | 151.3 | ±35.20 | 50 |
| Totals | 118.7 | 125.5 | ±7.92 | 680 |

*(A. Confidence interval calculated at 0.9 level)

## Fish Species Preferences - Target Species

Chapter three outlined the marine species available to recreational fishermen in the research area. Many fish species occupy specific habitats. Their capture depends upon the ability of the fishermen to exploit those habitats. This means fishermen arrive at a location with target species in mind.

For bank fishing parties, 55 percent did not target a specific species, but fished for anything. For the remaining fishing parties, anglers targeted blue crab, croaker, flounder, bluefish and spot (see Tables 5.5 to 5.8).

Table 5.5
Top Ten Target Species
Bank Fishing Parties
1981-1982

| Species | N= |
|---|---|
| Anything | 146 |
| Crab | 29 |
| Croaker | 18 |
| Flounder | 16 |
| Bluefish | 14 |
| Spot | 13 |
| Gray Trout | 10 |
| White Perch | 7 |
| Speckled Trout | 7 |
| Channel Catfish | 3 |

Table 5.7A
Bank Fishing Parties - Target Species
First Choice - 1982

| | N= | Adjusted Frequency |
|---|---|---|
| Bluefish | 2 | 2.6 |
| Channel Bass | 1 | 1.3 |
| Croaker | 5 | 6.6 |
| Flounder | 3 | 3.9 |
| Gray Trout | 1 | 1.3 |
| Speckled Trout | 1 | 1.3 |
| Spot | 3 | 3.9 |
| White Catfish | 1 | 1.3 |
| Crab | 14 | 18.4 |
| Other | 1 | 1.3 |
| Anything | 44 | 57.9 |
| | 76 | 100 |

Table 5.7B
Bank Fishing Parties - Target Species
Second Choice - 1982

| | N= |
|---|---|
| Bluefish | 1 |
| Croaker | 2 |
| Flounder | 2 |
| Gray Trout | 1 |
| Speckled Trout | 1 |
| Crab | 1 |
| Anything | 19 |
| | 27 |

Table 5.7C
Bank Fishing Parties - Target Species
Third Choice - 1982

| | N= | Adjusted Frequency |
|---|---|---|
| Anything | 7 | 100 |

Table 5.8A
Target Species - Bank Fishing Parties
1981 - 1982
First Choice

| Species | N= | Adjusted Frequency |
|---|---|---|
| Striped Bass | 2 | |
| Bluefish | 9 | |
| Channel Catfish | 3 | |
| Croaker | 11 | |
| Flounder | 9 | |
| Gray Trout | 7 | |
| Largemouth Bass | 1 | |
| Speckled Trout | 2 | |
| Spot | 11 | |
| Sunfishes | 1 | |
| White Catfish | 2 | |
| White Perch | 6 | |
| Crab | 25 | |
| Other | 2 | |
| Anything | 109 | |
| TOTALS | 200 | |

Table 5.8B
Target Species - Bank Fishing Parties
1981-1982
Second Choice

| | |
|---|---|
| Bluefish | 5 |
| Croaker | 7 |
| Flounder | 5 |
| Gray Trout | 2 |
| Speckled Trout | 5 |
| Spot | 1 |
| Crab | 4 |
| Anything | 27 |
| | 56 |

Table 5.8C
Target Species - Bank Fishing Parties
1981 - 1982
Third Choice

| | |
|---|---|
| Flounder | 2 |
| Gray Trout | 1 |
| Spot | 1 |
| White Perch | 1 |
| Anything | 10 |
| | 15 |

Table 5.9
Top Ten Target Species Boat Fishing Parties 1981-1982

| Species | N= | Adj Freq |
|---|---|---|
| Anything | 324 | 35 |
| Gray Trout | 115 | 13 |
| Flounder | 112 | 12 |
| White Perch | 96 | 10 |
| Croaker | 83 | 85 |
| Largemouth Bass | 60 | 7 |
| Striped Bass | 52 | 6 |
| Speckled Trout | 34 | 4 |
| Bluefish | 25 | 2.5 |
| Spot | 17 | 2 |

Boat fishermen chose a wider range of target species than bank fishing parties. There is a wider range of exploitable environments available to the boat fishermen than bank fishermen. Again, "anything" was the most targeted species. But, it only accounted for 32 percent of the first choice target species by boat fishermen. For specific species, anglers targeted flounder, gray trout, white perch and largemouth bass (see Table 5.9).

The presence of freshwater and saltwater species in the target species is indicative of the wide environmental range of the research sample area. White perch was targeted in the Albemarle region, but flounder was sought as a first in the eastern research area, (i.e., the Oregon Inlet and eastern Pamlico).

Table 5.10A
Target Species - Boat Fishing Parties
1981-1982
First Choice

| Species | N= | % | Rank |
|---|---|---|---|
| Striped Bass | 47 | 6.6 | 6 |
| Bluefish | 12 | 1.7 | (9-10) |
| Channel Bass | 3 | 0.4 | |
| Channel Catfish | 10 | 1.4 | |
| Crappie | 4 | 0.6 | |
| Croaker | 44 | 6.2 | 7 |
| Flounder | 83 | 11.7 | 2 |
| Gray Trout | 82 | 11.6 | (3-4) |
| Herring | 5 | 0.7 | |
| Largemouth Bass | 57 | 8.0 | 5 |
| Sea Mullet | 1 | 0.1 | |
| Speckled Trout | 17 | 2.4 | 8 |
| Spot | 12 | 1.7 | (9-10) |
| Sunfish | 7 | 1.0 | |
| White Catfish | 1 | 0.1 | |
| White Perch | 82 | 11.6 | (3-4) |
| Yellow Perch | 1 | 0.1 | |
| Spanish Mackerel | 2 | 0.3 | |
| King Mackerel | 1 | 0.1 | |
| Shrimp | 1 | 0.1 | |
| Clam | 1 | 0.1 | |
| Crab | 3 | 0.4 | |
| Other | 5 | 0.7 | |
| Anything | 227 | 32.0 | 1 |

Table 5.10B
Target Species - Boat Fishing Parties
1981-1982
Second Choice

| Species | N= | % |
|---|---|---|
| Striped Bass | 5 | 2.1 |
| Bluefish | 8 | 3.4 |
| Channel Catfish | 3 | 1.3 |
| Crappie | 1 | 0.4 |
| Croaker | 36 | 15.5 |
| Flounder | 23 | 9.9 |
| Gray Trout | 26 | 11.2 |
| Largemouth Bass | 3 | 1.3 |
| Sea Mullet | 1 | 0.4 |
| Speckled Trout | 13 | 5.6 |
| Spot | 5 | 2.1 |
| Sunfish | 2 | 0.9 |
| White Catfish | 2 | 0.9 |
| White Perch | 14 | 6.0 |
| Other | 3 | 1.2 |
| Anything | 88 | 37.8 |

Table 5.10C
Target Species - Boat Fishing Parties
1981-1982
Third Choice

| SPECIES | N= | % |
|---|---|---|
| Bluefish | 5 | 7.1 |
| Channel Catfish | 1 | 1.4 |
| Croaker | 3 | 4.3 |
| Flounder | 7 | 10.0 |
| Gray Trout | 7 | 10.0 |
| Sea Mullet | 2 | 2.9 |
| Speckled Trout | 4 | 5.7 |
| Sunfish | 1 | 1.4 |
| Crab | 1 | 1.4 |
| Anything | 39 | 55.7 |

Table 5.11B
Target Species - Boat Fishing Parties
Second Choice - 1981

| | | |
|---|---|---|
| Striped Bass | 5 | 5.0 |
| Bluefish | 2 | 2.0 |
| Channel Catfish | 1 | 1.0 |
| Crappie | 1 | 1.0 |
| Croaker | 20 | 19.8 |
| Flounder | 5 | 5.0 |
| Gray Trout | 12 | 11.9 |
| Largemouth Bass | 1 | 1.0 |
| Speckled Trout | 11 | 10.9 |
| Spot | 2 | 2.0 |
| Sunfish | 2 | 2.0 |
| White Perch | 10 | 9.9 |
| Other | 1 | 1.0 |
| Anything | 28 | 27.7 |

Table 5.11C
Target Species - Boat Fishing Parties
Third Choice - 1981

| | | |
|---|---|---|
| Bluefish | 4 | 14.3 |
| Channel Catfish | 1 | 3.6 |
| Croaker | 1 | 3.6 |
| Flounder | 1 | 3.6 |
| Gray Trout | 3 | 10.7 |
| Sea Mullet | 1 | 3.6 |
| Speckled Trout | 3 | 10.7 |
| Crab | 1 | 3.6 |
| Anything | 13 | 46.4 |

Table 5.12A
Target Species - Boat Fishing Parties
1982
First Choice

| | | |
|---|---|---|
| Striped Bass | 10 | 3.1 |
| Bluefish | 9 | 2.8 |
| Channel Bass | 2 | 0.6 |
| Channel Catfish | 2 | 0.6 |
| Crappie | 1 | 0.3 |
| Croaker | 25 | 7.9 |
| Flounder | 58 | 18.2 |
| Gray Trout | 30 | 9.4 |
| Largemouth Bass | 6 | 1.9 |
| Sea Mullet | 1 | 0.3 |
| Speckled Trout | 9 | 2.8 |
| Spot | 6 | 1.9 |
| White Perch | 21 | 6.6 |
| Spanish Mackerel | 2 | 0.6 |
| Crab | 3 | 0.9 |
| Other | 3 | 0.9 |
| Anything | 130 | 40.9 |

Table 5.12B
Target Species - Boat Fishing Parties
1982
Second Choice

| | | |
|---|---|---|
| Bluefish | 6 | 4.5 |
| Channel Catfish | 2 | 1.5 |
| Croaker | 16 | 12.1 |
| Flounder | 18 | 13.6 |
| Gray Trout | 14 | 10.6 |
| Largemouth Bass | 2 | 1.5 |
| Sea Mullet | 1 | 0.8 |
| Speckled Trout | 2 | 1.5 |
| Spot | 3 | 2.3 |
| White Catfish | 2 | 1.5 |
| White Perch | 4 | 3.0 |
| Other | 2 | 1.5 |
| Anything | 60 | 45.5 |

Table 5.12C
Third Choice

| | | |
|---|---|---|
| Bluefish | 1 | 2.4 |
| Croaker | 2 | 4.6 |
| Flounder | 6 | 14.3 |
| Gray Trout | 4 | 9.5 |
| Sea Mullet | 1 | 2.4 |
| Speckled Trout | 1 | 2.4 |
| Sunfish | 1 | 2.4 |
| Anything | 26 | 61.9 |

## Methods of Fishing

Detailed information was collected about the types of gear used by recreational fishing parties. As expected, hook-and-line tackle was the predominant gear in use. For bank fishermen, hook-and-line tackle accounted for 90 percent of the gears in use; for boat fishermen, 91 percent.

There were differences, between the two groups on secondary gears. For bank fishermen, the second most used gear type was "other." In most cases, this consisted of simple hand lines with bait attached (e.g., chicken necks) for use in the crab fishery. For boat fishing parties, the second most used gear was gill nets.

Table 5.13
Boat Fishing Parties - Gear Type Used
1981 - 1982

| Gear Type | N= | % |
|---|---|---|
| Hook-and-Line | 682 | 95.1 |
| Gill Net | 20 | 3.0 |
| Seine | 1 | .1 |
| Cast Net (Bait) | 1 | .1 |
| Cast Net (Other) | 0 | 0 |
| Rake/Tong | 1 | .1 |
| Gig | 7 | .9 |
| Other | 5 | .7 |

Table 5.14
Bank Fishing Parties - Gear Types In Use
1981 - 1982

| | Number of Parties Using Gear | % Total |
|---|---|---|
| Hook-and-Line | 191 | 88.8 |
| Gill Net | 0 | 0 |
| Seine | 0 | 0 |
| Cast Net (Bait) | 1 | .5 |
| Cast Net (Other) | 0 | 0 |
| Rake/Tongs | 0 | 0 |
| Gig | 1 | .5 |
| Other | 22 | 10.2 |

Table 5.15
Boat Fishing Parties - Hook-and-Line Fishing Style
1981 - 1982

| Fishing Style | N= | % |
|---|---|---|
| Troll | 103 | 10.5 |
| Still Fish | 234 | 24.0 |
| Drift | 472 | 48.4 |
| Cast | 159 | 16.3 |
| Other | 7 | .7 |

Table 5.16A
Boat Fishing Parties - Type of Bait Used
1981 - 1982

| | | |
|---|---|---|
| Artificial | 157 | 22.6% |
| Natural | 347 | 50.0% |
| Both | 178 | 25.6% |
| Neither | 12 | 1.8% |

Table 5.16B
Bank Fishing Parties - Type of Bait Used
1981 -1982

| Type of Bait | Number of Parties Using Bait Type | % |
|---|---|---|
| None | 2 | 1.0 |
| Artificial | 17 | 8.2 |
| Natural | 175 | 84.5 |

Fishing parties may utilize hook-and-line gear in several ways. Consequently, the totals in Table 5.15 are greater than the total boat fishing sample. Drifting was the preferred fishing technique of 49 percent of the hook-and-line boat fishing parties. With drifting, the fishing boat is not anchored, the engine is not run and the boat is permitted to drift with predominant wind or tidal currents. Still fishing was used by 24 percent of the boat fishing parties. With still fishing, the boat is anchored at the fishing location and the line, once placed in the water, is left undisturbed. Casting was used by 16 percent of the parties. With casting, a baited line is thrown into the water and slowly retrieved. The boat remains anchored.

The other type of hook and line fishing technique was trolling. With trolling, the line and bait are pulled behind a moving boat to attract fish. Eleven percent of the boat fishing parties used this technique.

Most bank fishermen, 85 percent, used natural bait --- worms, bait fish, or small shrimp. For catching crabs, fishermen used chicken necks. Eight percent of the bank fishing parties used artificial bait, and 5 percent used artificial and natural bait. For boat fishing, 50 percent of the parties used natural bait only, approximately 23 percent used artificial bait, and 25 percent used natural and artificial bait.

## Fishing Success and Catch Per Unit of Effort (CPUE)

The intent of recreational fishing is, of course, to catch fish. But every fisherman isn't successful in fulfilling that intent. In this study, 51 percent of the bank fishing parties were successful in catching fish. Fishing success is defined as catching and keeping at least one fish. It should be reiterated that bank fishing parties were interviewed during the fishing trip, but boat fishing parties were interviewed at the end of the trip. Boat fishing parties had an average success rate of 76 percent for 1981 and 1982. But the higher rate is attributable to the differences in the sampling methodology. The number of parties catching fish and the percent of fishing success for the two samples is given in Tables 5.17 and 5.18. For boat fishing parties, the success rate for 1982 dropped approximately 10 percent from the 1981 success rates.

Table 5.17
Number of Parties Catching Fish By Mode of Fishing 1981 - 1982

| | 1981 | 1982 | TOTAL |
|---|---|---|---|
| Bank Fishing Parties | 68 | 40 | 108 |
| Boat Fishing Parties | 315 | 249 | 564 |

Table 5.18
Percent of Fishing Success Bank Fishing Parties 1981 - 1982)

| | 1981 | 1982 | TOTAL |
|---|---|---|---|
| Bank Fishing Parties | 51 | 52 | 51 |

Table 5.19
Percent of Fishing Success Boat Fishing Parties 1981 - 1982

| | | | |
|---|---|---|---|
| Boat Fishing Parties | 80 | 71 | 76 |

The overall success rates for boat and bank fishing parties are roughly similar. But these success rates obscure differences in the number of fish caught that are not attributable to the sampling methodology. For 1981 and 1982, bank fishing parties reported a mean of 5.7 fish caught per party. But about half of the parties caught no fish and the median catch was 0.7 fish per party (Table 5.19). For boat fishing parties, the mean catch rate was 19 fish and the median 10 fish. As with bank fishing parties, the mode for each sample was 0 fish. A more detailed analysis of catch rates and numbers of fish caught will be presented in Tables 5.20 - 5.20F.

Table 5.20 Catch Per Unit of Effort Boat Fishing Parties 1981 - 1982.

| Region | No. in Party | Wet Gear Time | No. Fish Caught | CPUE | N= |
|---|---|---|---|---|---|
| Albemarle | 2.28 | 277.08 | 22.35 | 2.12 | 208 |
| Croatan/ Roanoke | 2.73 | 273.44 | 17.06 | 1.37 | 33 |
| Oregon Inlet | 3.12 | 303.36 | 16.48 | 1.04 | 236 |
| Western Pamlico | 2.72 | 281.99 | 22.48 | 1.76 | 105 |
| Neuse River | 2.0 | 280.00 | 7.33 | 0.79 | 18 |
| Eastern Pamlico | 3.12 | 272.17 | 18.61 | 1.31 | 42 |
| Totals | 2.58 | 282 | 22.5 | 2.07 | 378 |

Table 5.20A
Creel Data Returns
By Region
Albemarle

| Species | Catch Rate Per Party | %Total Catch |
|---|---|---|
| White Perch | 10.91 | 64.8 |
| Channel Catfish | 1.88 | 11.2 |
| Herring | 1.32 | 7.8 |
| Striped Bass | 0.83 | 4.9 |
| Crappie | 0.58 | 3.4 |
| Sunfish | 0.58 | 3.4 |
| Yellow Perch | 0.53 | 3.1 |
| Bluefish | 0.32 | 1.9 |
| Largemouth Bass | 0.25 | 1.5 |
| Spot | 0.17 | 1.0 |

Table 5.20B
Croatan/Roanoke Region

| Species | Catch Rate Per Party | %Total Catch |
|---|---|---|
| Croaker | 15.97 | 81.7 |
| Sunfish | 1.64 | 8.4 |
| Flounder | 0.72 | 3.7 |
| Bluefish | 0.72 | 3.7 |
| Spot | 0.28 | 1.4 |
| Gray Trout | 0.19 | 1.0 |
| Sea Mullet | 0.03 | 0.2 |

Table 5.20C
Creel Data Oregon Inlet

| Species | Catch Rate Per Party | %Total Catch |
|---|---|---|
| Flounder | 4.05 | 27.5 |
| Croaker | 3.83 | 26.0 |
| Bluefish | 3.73 | 25.3 |
| Spot | 1.45 | 9.9 |
| Speckled Trout | 0.62 | 4.2 |
| Sea Mullet | 0.52 | 3.5 |
| Gray Trout | 0.42 | 2.9 |

Table 5.20D
Western Pamlico

| Species | Catch Rate Per Party | %Total Catch |
|---|---|---|
| Croaker | 10.63 | 67.9 |
| Bluefish | 2.19 | 14.0 |
| Gray Trout | 1.35 | 8.6 |
| Sunfish | 0.80 | 5.1 |
| Spot | 0.34 | 2.2 |
| Sea Mullet | 0.24 | 1.5 |
| Speckled Trout | 0.10 | 0.6 |

Table 5.20E
Creel Data Neuse River

| Species | Catch Rate Per Party | %Total Catch |
|---|---|---|
| Flounder | 3.41 | 62.4 |
| Croaker | 1.09 | 20.0 |
| Sunfish | 0.27 | 4.9 |
| Striped Bass | 0.23 | 4.2 |
| Bluefish | 0.14 | 2.6 |
| Spot | 0.09 | 1.6 |
| White Catfish | 0.09 | 1.6 |
| Yellow Perch | 0.09 | 1.6 |
| Channel Catfish | 0.05 | 0.9 |

Table 5.20F
Eastern Pamlico

| Species | Catch Rate Per Party | %Total Catch |
|---|---|---|
| Flounder | 5.49 | 50.4 |
| Croaker | 3.14 | 28.8 |
| Bluefish | 1.25 | 11.5 |
| Gray Trout | 0.37 | 3.4 |
| Channel Bass | 0.31 | 2.8 |
| Largemouth Bass | 0.12 | 1.1 |
| Sea Mullet | 0.10 | 0.9 |
| Speckled Trout | 0.04 | 0.4 |
| Spanish Mackerel | 0.04 | 0.4 |
| Spot | 0.02 | 0.2 |

The calculation of CPUE in Table 5.30 used creel survey returns only. Catches that were not verified were discarded from the data. The CPUE was calculated only for boat hook-and-line fishermen. The CPUE expresses the number of fish caught per fisherman per hour of fishing time.

The catch per unit of effort was not calculated for bank fishermen due to the sampling methodolgy employed. Bank fishing parties were intercepted during their fishing trip, and catches were not reflective of their fishing trip. To calculate fishing time, interviewers asked how long bank fishermen planned to fish that day and not how long they had been fishing up to the point of the interview.

## Disposition of Catch

What do recreational fishermen do with their catches? For bank fishing parties, 87 percent of the catch was to be consumed by the household(s) of the fishermen. Another 6 percent planned to give away all of their catch to friends or relatives. None of the recreational catches were sold by bank fishing parties.

Table 5.21
Disposition of Catch - Bank Fishing Parties
1981 - 1982

(Total Number of Parties Catching Fish = 110)

| | Range | N= |
|---|---|---|
| Household | 0 | 7 |
| | Less 50% | 3 |
| | 50% | 2 |
| | Above 50% | 2 |
| | 100% | 92 |
| | | N= |
| Given Away to Friends, Relatives, Other | 0 | 93 |
| | Less 50% | 2 |
| | 50% | 2 |
| | Above 50% | 3 |
| | 100% | 6 |
| | | N= |
| Sold | 0 | 106 |
| | Less 50% | 0 |
| | 50% | 0 |
| | Above 50% | 0 |
| | 100% | 0 |
| | | N= |
| Disposed of In Another Way | 0 | 99 |
| | Less 50% | 0 |
| | 50% | 0 |
| | Above 50% | 0 |
| | 100% | 7 |

Boat fishing parties disposed of their catches much like bank fishermen. But the larger catches of this group appear to be related to a slightly different distribution pattern. The majority (68 percent) of the boat fishing parties reported that all of the catch would be consumed by the households of the participating members. Eight percent reported that all of the catch would be given to friends or relatives. Another 1.3 percent of the boat fishing sample (n=7) reported that part of the catch

would be sold to wholesalers or retailers. Two cases (0.3 percent) stated that all of the party's catch would be sold.

Table 5.22A
Disposition of Catch - Boat Fishing Parties
1981 - 1982
FISH SOLD

(Total number boat parties selling fish = 16 cases)
(Total number of boat fishing parties that caught fish = 564, or approximately 76% of total boat fishing party sample of 746 cases. Percent of parties selling fish = 2.8% )

| Type of Establishment where fish were sold | N= |
|---|---|
| Local Restaurant Within Site County | 1 |
| Local Wholesaler Within Site County | 2 |
| Local Retailer or Fish Market Within Site County | 4 |
| Restaurant Outside Site County | 0 |
| Wholesaler Outside Site County | 1 |
| Retailer or Fish Market Outside Site County | 5 |
| Other | 3 |

(Fish sold includes striped bass sales as well as finfish sales. Striped Bass sales occurred in only two cases.)

Table 5.22B
Boat Fishing Parties - Disposition of Catch
1981 - 1982

(Total Number of Parties Catching Fish = 564)

| Type of Disposition | Percent Catch | N= |
|---|---|---|
| Household | Less 50% | 42 |
| | 50% | 52 |
| | Above 50% | 21 |
| | 100% | 380 |
| Given Away to Friends/ Relatives, Others | Less 50% | 17 |
| | 50% | 47 |
| | Above 50% | 36 |
| | 100% | 46 |
| Sold | Less 50% | 1 |
| | 50% | 3 |
| | Above 50% | 1 |
| | 100% | 2 |
| Disposed, Other | Less 50% | 5 |
| | 50% | 3 |
| | Above 50% | 0 |
| | 100% | 10 |

## Fishing Trip Expenses

Recreational fishing incurs certain costs or expenses. In this section, those trip expenditures will be described and analyzed. These expenditures were calculated for the entire fishing party and not just the interviewee.

### Categories of Expenditures

The following are the definitions for the expense categories used in this study:

A. Gas and oil for boat:

Money spent on gas and oil for the boat during that trip. Expenses include all prior and all further fishing expenditures linked directly with the fishing trip.

B. Gas and oil for transporting vehicle:

Money spent on gas and oil for the vehicles used to transport the party to and from the fishing location.

C. Lodging, motel or camping fees:

All costs for hotel, motel or camping ground fees incurred by the party for the duration of the fishing trip.

D. Bait and Tackle

This category includes money spent for bait and tackle during the fishing trip.

E. Restaurant meals

Expenses include the money spent on prepared meals for fishing party members, including meals to and from the fishing location.

F. Groceries, including ice

This category includes all money spent for food, beverages or ice used for personal consumption during the fishing trip (excluding alcoholic beverages).

G. Beer, alcoholic beverages:

Money spent on beer or other alcoholic beverages.

H. Launching, storage, or marina fees:

Fees used for launching a boat at private facilities (e.g., ramp). Also included are those expenses incurred during the fishing trip for storage or dockage fees (e.g., fees for use of a marina slip during the fishing trip).

I. Repairs to boat, motor, gear:

Money spent to repair the boat or motor used during the fishing trip. These expenses were incurred during the trip and were made to place the gear in a condition suitable for further fishing (e.g., fixing of an outboard motor to continue fishing). This category does not include money expected to be spent for repairs at the termination of the trip.

J. Boat charter, rental, or party boat fees:

Fees incurred for boat rental or boat charter during the fishing trip.

K. Other expenses:

This category included miscellaneous expenditures such as medical supplies (e.g., bandages or sunburn lotion) or camping supplies (e.g., stove fuel for portable camping stove).

## Boat Fishing Party Expenditures

### Total Trip Expenditures by Category

A breakdown of the average trip expenditures for boat fishing parties is given in Table 5.23 through 5.25. The total trip expenditure for boat fishing parties averaged $161.30 (N=712). This total should be viewed with caution. There was considerable variance in mean trip expenditures from region to region, depending on such variables as lodging costs and distance traveled. A breakdown of the expenses by region will be presented in a later section.

Table 5.23
Total Trip Expenditures - Boat Fishing Parties
1981 - 1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 45.70 | 56.20 | 225 |
| Croatan/Roanoke | 178.60 | 194.40 | 36 |
| Oregon Inlet | 261.80 | 355.40 | 249 |
| Western Pamlico | 73.90 | 71.20 | 129 |
| Neuse River | 30.50 | 22.90 | 22 |
| Eastern Pamlico | 446.20 | 541.20 | 51 |
| Totals | 161.30 | 289.70 | 712 |

Table 5.24
Total Trip Expenses - Boat Fishing Parties
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albamarle | 45.00 | 55.40 | 181 |
| Croatan/Roanoke | 176.60 | 221.30 | 19 |
| Oregon Inlet | 189.30 | 220.30 | 53 |
| Western Pamlico | 78.80 | 80.40 | 93 |
| Neuse River | 33.70 | 25.70 | 16 |
| Eastern Pamlico | 550.10 | 625.70 | 33 |
| Totals | 120.40 | 209.60 | 395 |

Table 5.25
Total Trip Expenditures - Boat Fishing Parties
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 48.40 | 60.10 | 44 |
| Croatan/Roanoke | 180.80 | 165.90 | 17 |
| Oregon Inlet | 281.40 | 381.90 | 196 |
| Western Pamlico | 61.00 | 36.10 | 36 |
| Neuse River | 22.20 | 10.00 | 6 |
| Eastern Pamlico | 255.60 | 255.00 | 18 |
| Totals | 212.30 | 311.60 | 18 |

The largest expenditure for boat fishing parties was lodging. The mean for this expense was $36.50 per party. Lodging contributed to 22.6 percent of the total trip costs. Other expenditures were as follows: gas and oil, 20.6 percent of total trip costs, a mean of $33.20; groceries, 14.4 percent of total trip costs, a mean of $23.30; fuel for transporting vehicles, 12.7 percent of total trip costs, a mean of $20.60; meals, 9.7 percent of total trip costs, a mean of $15.80. Consumable items, including

groceries, prepared meals, and alcoholic beverages represented a total of 29.1 percent of the trip expenditures. But these are average expenditures for the entire boat fishing sample. Individual fishing party totals vary considerably from these means. A breakdown of expenditures by category for boat fishing parties is presented in Tables 5.27A-K, 5.28A-K, and 5.29A-K.

Table 5.27A
Trip Expenditures - Boat Fishing Parties
Gas and Oil for Boat
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 10.00 | 10.70 | 181 |
| Croatan/Roanoke | 11.50 | 12.80 | 19 |
| Oregon Inlet | 25.60 | 32.10 | 53 |
| Western Pamlico | 19.10 | 16.40 | 93 |
| Neuse River | 10.40 | 7.00 | 16 |
| Eastern Pamlico | 47.70 | 43.00 | 33 |
| Totals | 17.50 | 20.40 | 395 |

Table 5.27B
Trip Expenditures - Boat Fishing Parties
Gas and Oil for Transporting Vehicle
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 10.90 | 16.30 | 181 |
| Croatan/Roanoke | 32.90 | 19.50 | 19 |
| Oregon Inlet | 38.60 | 31.90 | 53 |
| Western Pamlico | 18.20 | 14.20 | 93 |
| Neuse River | 9.10 | 9.00 | 16 |
| Eastern Pamlico | 144.70 | 254.80 | 33 |
| Totals | 28.50 | 75.30 | 395 |

Table 5.27C
Trip Expenditures - Boat Fishing Parties
Lodging - Motel and Camping Fees
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.20 | 8.50 | 181 |
| Crotan/Roanoke | 67.60 | 154.30 | 19 |
| Oregon Inlet | 46.50 | 97.50 | 53 |
| Western Pamlico | 4.80 | 15.00 | 93 |
| Neuse River | 0 | 0 | 16 |
| Eastern Pamlico | 139.80 | 190.30 | 33 |
| Totals | 23.30 | 73.70 | 395 |

Table 5.27D
Trip Expenditures - Boat Fishing Parties
Bait and Tackle
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 5.00 | 11.80 | 181 |
| Croatan/Roanoke | 13.10 | 11.10 | 19 |
| Oregon Inlet | 16.50 | 49.50 | 53 |
| Western Pamlico | 7.20 | 9.30 | 93 |
| Neuse River | 3.40 | 5.00 | 16 |
| Eastern Pamlico | 35.60 | 65.30 | 33 |
| Totals | 10.00 | 27.70 | 395 |

Table 5.27E
Trip Expenditures - Boat Fishing Parties
Restaurant Meals
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 3.10 | 8.90 | 181 |
| Croatan/Roanoke | 13.80 | 24.30 | 19 |
| Oregon Inlet | 23.00 | 31.70 | 53 |
| Western Pamlico | 5.10 | 11.90 | 93 |
| Neuse River | 2.30 | 7.20 | 16 |
| Eastern Pamlico | 31.90 | 45.40 | 33 |
| Totals | 9.20 | 45.40 | 395 |

Table 5.27F
Trip Expenditures - Boat Fishing Parties
Groceries, Including Ice
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 5.00 | 7.60 | 181 |
| Croatan/Roanoke | 26.30 | 46.90 | 19 |
| Oregon Inlet | 24.80 | 41.70 | 53 |
| Western Pamlico | 9.90 | 16.50 | 93 |
| Neuse River | 4.10 | 11.60 | 16 |
| Eastern Pamlico | 71.60 | 71.60 | 33 |
| Totals | | | |

Table 5.27G
Trip Expenditures - Boat Fishing Parties
Beer or Other Alcoholic Beverages
1981

| Region | Mean | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.10 | 4.80 | 181 |
| Croatan/Roanoke | 5.50 | 7.60 | 19 |
| Oregon Inlet | 10.50 | 18.90 | 53 |
| Western Pamlico | 4.50 | 12.50 | 93 |
| Neuse River | 1.10 | 2.50 | 16 |
| Eastern Pamlico | 42.90 | 122.00 | 33 |
| Totals | 7.30 | 36.40 | 395 |

Table 5.27H
Trip Expenditures - Boat Fishing Parties
Launching, Storage, and Marina Fees
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.60 | 2.30 | 181 |
| Croatan/Roanoke | 1.70 | 1.80 | 19 |
| Oregon Inlet | 0.10 | 0.40 | 53 |
| Western Pamlico | 1.70 | 1.50 | 93 |
| Neuse River | 0 | 0 | 16 |
| Eastern Pamlico | 22.60 | 34.90 | 33 |
| Totals | 2.60 | 10.20 | 395 |

Table 5.27I
Trip Expenditures - Boat Fishing Parties
Repairs to Boat, Motor, Gear
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 5.20 | 21.10 | 181 |
| Croatan/Roanoke | 0 | 0 | 19 |
| Oregon Inlet | 2.50 | 10.90 | 53 |
| Western Pamlico | 6.20 | 33.40 | 93 |
| Neuse River | 2.80 | 10.00 | 16 |
| Eastern Pamlico | 9.00 | 28.30 | 33 |
| Totals | 5.00 | 23.60 | 395 |

Table 5.27J
Trip Expenditures - Boat Fishing Parties
Boat Charter, Rental, or Party Boat Fees
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 181 |
| Croatan/Roanoke | 4.20 | 18.40 | 19 |
| Oregon Inlet | 0 | 0 | 53 |
| Western Pamlico | 0 | 0 | 93 |
| Neuse River | 0 | 0 | 16 |
| Eastern Pamlico | 0 | 0.20 | 33 |
| Totals | 0.20 | 3.90 | 395 |

Table 5.27K
Trip Expenditures - Boat Fishing Parties
Other Expenses
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.80 | 5.00 | 181 |
| Croatan/Roanoke | 0 | 0 | 19 |
| Oregon Inlet | 1.30 | 7.10 | 53 |
| Western Pamlico | 2.30 | 12.10 | 93 |
| Neuse River | 0.60 | 2.50 | 16 |
| Eastern Pamlico | 4.20 | 13.70 | 33 |
| Totals | 1.50 | 8.30 | 395 |

Table 5.28A
Trip Expenditures - Boat Fishing Parties
Gas and Oil for Boat
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 9.00 | 8.60 | 44 |
| Croatan/Roanoke | 13.40 | 8.70 | 17 |
| Oregon Inlet | 30.10 | 45.10 | 196 |
| Western Pamlico | 14.70 | 7.70 | 36 |
| Neuse River | 8.80 | 4.20 | 6 |
| Eastern Pamlico | 35.10 | 37.30 | 18 |
| Totals | 24.40 | 37.10 | 317 |

Table 5.28B
Trip Expenditures - Boat Fishing Parties
Gas and Oil for Transporting Vehicle
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 15.30 | 22.20 | 44 |
| Croatan/Roanoke | 72.10 | 123.40 | 17 |
| Oregon Inlet | 45.10 | 51.60 | 196 |
| Western Pamlico | 17.60 | 9.20 | 36 |
| Neuse River | 8.00 | 5.50 | 6 |
| Eastern Pamlico | 55.30 | 50.70 | 18 |
| Totals | 39.20 | 51.70 | 317 |

Table 5.28C
Trip Expenditures - Boat Fishing Parties
Lodging - Motel and Camping Fees
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 1.70 | 6.60 | 44 |
| Croatan/Roanoke | 35.60 | 47.10 | 17 |
| Oregon Inlet | 74.50 | 151.90 | 196 |
| Western Pamlico | 0.90 | 4.30 | 36 |
| Neuse River | 0 | 0 | 6 |
| Eastern Pamlico | 82.10 | 126.30 | 18 |
| Totals | 53.00 | 124.40 | 317 |

Table 5.28D
Trip Expenditures - Boat Fishing Parties
Bait and Tackle
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 7.40 | 22.40 | 44 |
| Croatan/Roanoke | 12.20 | 9.10 | 7 |
| Oregon Inlet | 18.80 | 55.00 | 196 |
| Western Pamlico | 6.60 | 7.10 | 36 |
| Neuse River | 0.70 | 1.00 | 6 |
| Eastern Pamlico | 11.90 | 17.80 | 18 |
| Totals | 14.80 | 44.60 | 317 |

Table 5.28E
Trip Expenditures - Boat Fishing Parties
Restaurant Meals
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 1.30 | 5.00 | 44 |
| Croatan/Roanoke | 11.40 | 18.90 | 17 |
| Oregon Inlet | 35.40 | 63.10 | 196 |
| Western Pamlico | 6.00 | 12.30 | 36 |
| Neuse River | 1.70 | 2.70 | 6 |
| Eastern Pamlico | 13.50 | 25.90 | 18 |
| Totals | 24.20 | 50.70 | 317 |

Table 5.28F
Trip Expenditures - Boat Fishing Parties
Groceries, Including Ice
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 8.50 | 11.20 | 44 |
| Croatan/Roanoke | 21.80 | 25.70 | 17 |
| Oregon Inlet | 44.80 | 92.10 | 196 |
| Western Pamlico | 8.60 | 10.10 | 36 |
| Neuse River | 1.30 | 1.50 | 6 |
| Eastern Pamlico | 38.90 | 42.20 | 18 |
| Totals | 33.30 | 74.10 | 317 |

Table 5.28G
Trip Expenditures - Boat Fishing Parties
Beer or Other Alcoholic Beverages
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 3.30 | 9.20 | 44 |
| Croatan/Roanoke | 5.10 | 8.90 | 17 |
| Oregon Inlet | 11.60 | 28.90 | 196 |
| Western Pamlico | 4.00 | 16.70 | 36 |
| Neuse River | 1.70 | 2.90 | 6 |
| Eastern Pamlico | 4.20 | 6.40 | 18 |
| Totals | 8.60 | 24.00 | 317 |

Table 5.28H
Trip Expenditures - Boat Fishing Parties
Launching, Storage, and Marina Fees
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0.20 | 44 |
| Croatan/Roanoke | 2.50 | 2.10 | 17 |
| Oregon Inlet | 0.70 | 6.10 | 196 |
| Western Pamlico | 2.00 | 3.20 | 36 |
| Neuse River | 0 | 0 | 6 |
| Eastern Pamlico | 10.40 | 17.40 | 18 |
| Totals | 1.40 | 6.40 | 317 |

Table 5.28I
Trip Expenditures - Boat Fishing Parties
Repairs to Boat, Motor, Gear
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 1.80 | 10.50 | 44 |
| Croatan/Roanoke | 6.80 | 17.90 | 17 |
| Oregon Inlet | 6.60 | 30.00 | 196 |
| Western Pamlico | 0.30 | 1.10 | 36 |
| Neuse River | 0 | 0 | 6 |
| Eastern Pamlico | 0.20 | 0.90 | 18 |
| Totals | 4.70 | 24.40 | 317 |

Table 5.28J
Trip Expenditures - Boat Fishing Parties
Boat Charter, Rental, or Party Boat Fees
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 44 |
| Croatan/Roanoke | 0 | 0 | 17 |
| Oregon Inlet | 12.50 | 105.30 | 196 |
| Western Pamlico | 0 | 0 | 36 |
| Neuse River | 0 | 0 | 6 |
| Eastern Pamlico | 3.30 | 14.10 | 18 |
| Totals | 7.90 | 83.50 | 18 |

Table 5.28K
Trip Expenditures - Boat Fishing Parties
Other Expenses
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 44 |
| Croatan/Roanoke | 0 | 0 | 17 |
| Oregon Inlet | 1.50 | 7.80 | 196 |
| Western Pamlico | 0.20 | 1.00 | 36 |
| Neuse River | 0 | 0 | 6 |
| Eastern Pamlico | 0.60 | 2.40 | 18 |
| Totals | 1.00 | 6.20 | 317 |

Table 5.29A
Trip Expenditures - Boat Fishing Parties
Gas and Oil for Boat
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 9.80 | 10.30 | 225 |
| Croatan/Roanoke | 12.40 | 11.00 | 36 |
| Oregon Inlet | 29.10 | 42.70 | 249 |
| Western Pamlico | 17.90 | 14.60 | 129 |
| Neuse River | 10.00 | 6.30 | 22 |
| Eastern Pamlico | 43.30 | 41.20 | 51 |
| Totals | 20.60 | 30.70 | 712 |

Table 5.29B
Trip Expenditures - Boat Fishing Parties
Gas and Oil for Transporting Vehicle
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 11.80 | 17.60 | 225 |
| Croatan/Roanoke | 51.40 | 86.90 | 36 |
| Oregon Inlet | 43.70 | 48.10 | 249 |
| Western Pamlico | 18.00 | 13.00 | 129 |
| Neuse River | 8.80 | 8.10 | 22 |
| Eastern Pamlico | 113.20 | 210.40 | 51 |
| Totals | 33.20 | 71.70 | 712 |

Table 5.29C
Trip Expenditures - Boat Fishing Parties
Lodging - Motel and Camping Fees
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.10 | 8.10 | 225 |
| Croatan/Roanoke | 52.50 | 116.30 | 36 |
| Oregon Inlet | 68.50 | 142.40 | 249 |
| Western Pamlico | 3.70 | 13.00 | 129 |
| Neuse River | 0 | 0 | 22 |
| Eastern Pamlico | 119.40 | 171.40 | 51 |
| Totals | 36.50 | 106.40 | 712 |

Table 5.29D
Trip Expenditures - Boat Fishing Parties
Bait and Tackle
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 5.50 | 14.50 | 225 |
| Croatan/Roanoke | 12.70 | 10.00 | 36 |
| Oregon Inlet | 18.30 | 53.80 | 249 |
| Western Pamlico | 7.00 | 8.80 | 129 |
| Neuse River | 7.00 | 8.80 | 22 |
| Eastern Pamlico | 27.20 | 54.50 | 51 |
| Totals | 12.10 | 36.80 | 712 |

Table 5.29E
Trip Expenditures - Boat Fishing Parties
Restaurant Meals
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.80 | 8.30 | 225 |
| Croatan/Roanoke | 12.70 | 21.70 | 36 |
| Oregon Inlet | 32.70 | 58.10 | 249 |
| Western Pamlico | 5.40 | 12.00 | 129 |
| Neuse River | 2.10 | 6.20 | 22 |
| Eastern Pamlico | 25.40 | 40.40 | 51 |
| Totals | 15.80 | 39.40 | 712 |

Table 5.29F
Trip Expenditures - Boat Fishing Parties
Groceries, Including Ice
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 5.70 | 8.50 | 225 |
| Croatan/Roanoke | 24.20 | 37.90 | 36 |
| Oregon Inlet | 40.50 | 84.30 | 249 |
| Western Pamlico | 9.50 | 15.00 | 129 |
| Neuse River | 3.40 | 9.90 | 22 |
| Eastern Pamlico | 60.10 | 64.30 | 51 |
| Totals | 23.30 | 57.00 | 712 |

Table 5.29G
Trip Expenditures - Boat Fishing Parties
Beer or Other Alcoholic Beverages
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.30 | 5.90 | 225 |
| Croatan/Roanoke | 5.30 | 8.10 | 36 |
| Oregon Inlet | 11.30 | 27.10 | 249 |
| Western Pamlico | 4.40 | 13.70 | 129 |
| Neuse River | 1.30 | 2.50 | 22 |
| Eastern Pamlico | 29.30 | 99.50 | 51 |
| Totals | 7.90 | 32.40 | 712 |

Table 5.29H
Trip Expenditures - Boat Fishing Parties
Launching, Storage, and Marina Fees
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.50 | 2.10 | 225 |
| Croatan/Roanoke | 2.10 | 1.90 | 36 |
| Oregon Inlet | 0.50 | 5.50 | 249 |
| Western Pamlico | 1.80 | 2.10 | 129 |
| Neuse River | 0 | 0 | 22 |
| Eastern Pamlico | 18.30 | 30.30 | 51 |
| Totals | 2.10 | 9.90 | 712 |

Table 5.29I
Trip Expenditures - Boat Fishing Parties
Repairs to Boat, Motor, Gear
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 4.50 | 19.50 | 225 |
| Croatan/Roanoke | 3.20 | 12.60 | 36 |
| Oregon Inlet | 5.70 | 27.10 | 249 |
| Western Pamlico | 4.50 | 28.40 | 129 |
| Neuse River | 2.00 | 8.50 | 22 |
| Eastern Pamlico | 5.90 | 23.10 | 51 |
| Totals | 4.90 | 23.90 | 712 |

Table 5.29J
Trip Expenditures - Boat Fishing Parties
Boat Charter, Rental, or Party Boat Fees
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 225 |
| Croatan/Roanoke | 2.20 | 13.30 | 36 |
| Oregon Inlet | 9.80 | 93.60 | 249 |
| Western Pamlico | 0 | 0 | 129 |
| Neuse River | 0 | 0 | 0 |
| Eastern Pamlico | 1.20 | 8.40 | 51 |
| Totals | 3.60 | 55.60 | 712 |

Table 5.29K
Trip Expenditures - Boat Fishing Parties
Other Expenses
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.70 | 4.50 | 225 |
| Croatan/Roanoke | 0 | 0 | 36 |
| Oregon Inlet | 1.40 | 7.60 | 249 |
| Western Pamlico | 1.70 | 10.30 | 129 |
| Neuse River | 0.50 | 2.10 | 22 |
| Eastern Pamlico | 2.90 | 11.20 | 51 |
| Totals | 1.20 | 7.40 | 712 |

The variation in trip expenditures for boat fishing parties is linked to the area in which the fishing took place. Tourist or nonlocal fishermen concentrated in the Outer Banks regions. Federal parks (i.e., Cape Hatteras National Seashore) and tourist facilities (e.g., motels and restaurants) in these areas attracted numerous visitors and their families over the past decade and a half. Beach or water access is easy, and many visitors include recreational fishing in their itineraries. The cost of a fishing trip in these areas thus reflects cost of visiting the area for more than one day.

In other areas such as the Neuse River or the Albemarle Sound, recreational fishing is more localized. Consequently, the cost of the fishing trip is less. For example, the Neuse River and Albemarle Sound fishermen reported mean trip expenditures less than $50.

But the Outer Banks trip expenditures for the Croatan/Roanoke region totaled $178.60. At Oregon Inlet, expenses amounted to $261.80. And in the Eastern Pamlico Region, which included interview sites south of Oregon Inlet to Ocracoke, expenditures reached $446.20 - a ten-fold increase over expenditures in the Albemarle and Neuse River regions. The following is a breakdown of the expenses for each of the research areas.

Region One - Albemarle Sound Region

The total trip expenditures for fishing parties in the Albemarle Sound region averaged $45.70. The largest expense was the money spent on gas and oil for the transporting vehicle(s). It accounted for 25.8 percent of the total expenses or $11.80. Other expenditures were as follows: gas and oil

for the boat 21.4 percent, bait and tackle 12.5 percent, and groceries 12.0 percent (see Table 5.30).

Table 5.30
Mean Trip Expenditures
Boat Fishing Parties
Albemarle Region
1981-1982

N = 225

Total Mean Trip Expenditure = $45.70)

| Expense Category | Mean($) | S.D. | C.I. |
|---|---|---|---|
| A. Gas/Oil Boat | 9.80 | 10.30 | ±1.13 |
| B. Gas/Oil Car | 11.80 | 17.60 | ±1.93 |
| C. Lodging | 2.10 | 8.10 | ±0.89 |
| D. Bait/Tackle | 5.50 | 14.50 | ±1.59 |
| E. Meals | 2.80 | 8.30 | ±0.91 |
| F. Groceries | 5.70 | 8.50 | ±0.93 |
| G. Alcoholic Bev. | 2.30 | 5.90 | ±0.65 |
| H. Launch Fees | 0.50 | 2.10 | ±0.23 |
| I. Repairs | 4.50 | 19.50 | ±2.14 |
| J. Boat Rental Fees | 0 | 0 | ±0 |
| K. Other | 0.70 | 4.5 | ±0.49 |
| Totals | 45.70 | 56.0 | ±6.17 |

Table 5.31
Mean Trip Expenditures
Boat Fishing Parties
Croatan/Roanoke Region
1981-1982

N = 36

Total Mean Trip Expenditure = $178.60

| Expense Category | Mean($) | S.D. | C.I. |
|---|---|---|---|
| A. Gas/Oil Boat | 12.40 | 11.00 | ± 3.02 |
| B. Gas/Oil Car | 51.40 | 86.90 | ±23.80 |
| C. Lodging | 52.50 | 116.30 | ±31.89 |
| D. Bait/Tackle | 12.70 | 10.00 | ± 2.74 |
| E. Meals | 12.70 | 21.70 | ± 5.95 |
| F. Groceries | 24.20 | 37.90 | ±10.39 |
| G. Alcoholic Bev. | 5.30 | 8.10 | ± 2.22 |
| H. Launch Fees | 2.10 | 1.90 | ± 5.21 |
| I. Repairs | 3.20 | 12.60 | ± 0.44 |
| J. Boat Rental Fees | 2.20 | 13.30 | ± 3.65 |
| K. Other | 0 | 0 | ± 0 |
| Totals | 178.60 | 194.40 | ±53.3 |

Table 5.32
Mean Trip Expenditures
Boat Fishing Parties
Oregon Inlet Region
1981-1982

N = 249

Total Mean Trip Expenditure = $261.80

| Expense Category | Mean($) | S.D. | C.I. |
|---|---|---|---|
| A. Gas/Oil Boat | 29.10 | 42.70 | ± 4.45 |
| B. Gas/Oil Car | 43.70 | 48.10 | ± 5.01 |
| C. Lodging | 68.50 | 142.40 | ±14.84 |
| D. Bait/Tackle | 18.30 | 53.80 | ± 5.61 |
| E. Meals | 32.70 | 58.10 | ± 6.06 |
| F. Groceries | 40.50 | 84.30 | ± 8.79 |
| G. Alcoholic Bev. | 11.30 | 27.10 | ± 2.82 |
| H. Launch Fees | 0.50 | 5.50 | ± 0.57 |
| I. Repairs | 5.70 | 27.10 | ± 2.82 |
| J. Boat Rental Fees | 9.80 | 93.60 | ± 9.76 |
| K. Other | 1.40 | 7.60 | ± 0.79 |
| Totals | 261.80 | 355.40 | ±37.05 |

Table 5.33

Mean Trip Expenditures
Boat Fishing Parties
Western Pamlico Region
1981-1982

N = 129

Total Mean Trip Expenditure = $73.90

| Expense Category | Mean($) | S.D. | C.I. |
|---|---|---|---|
| A. Gas/Oil Boat | 17.90 | 14.60 | ± 2.11 |
| B. Gas/Oil Car | 18.00 | 13.00 | ± 1.88 |
| C. Lodging | 3.70 | 13.00 | ± 1.88 |
| D. Bait/Tackle | 7.00 | 8.80 | ± 1.27 |
| E. Meals | 5.40 | 12.00 | ± 1.74 |
| F. Groceries | 9.50 | 15.00 | ± 2.17 |
| G. Alcoholic Bev. | 4.40 | 13.70 | ± 1.98 |
| H. Launch Fees | 1.80 | 2.10 | ± 0.30 |
| I. Repairs | 4.50 | 28.40 | ± 4.11 |
| J. Boat Rental Fees | 0 | 0 | ± 0 |
| K. Other | 1.70 | 10.30 | |
| Totals | 73.90 | 71.20 | ±10.31 |

Table 5.34
Mean Trip Expenditures
Boat Fishing Parties
Neuse River Region
1981-1982

N = 22

Total Mean Trip Expenditure = $30.50

| Expense Category | Mean($) | S.D. | C.I. |
|---|---|---|---|
| A. Gas/Oil Boat | 10.00 | 6.30 | ±2.21 |
| B. Gas/Oil Car | 8.80 | 8.10 | ±2.84 |
| C. Lodging | 0 | 0 | ±0 |
| D. Bait/Tackle | 2.60 | 4.50 | ±1.58 |
| E. Meals | 2.10 | 6.20 | ±2.17 |
| F. Groceries | 3.40 | 9.90 | ±3.47 |
| G. Alcoholic Bev. | 1.30 | 2.50 | ±0.88 |
| H. Launch Fees | 0 | 0 | ±0 |
| I. Repairs | 2.00 | 8.50 | ±2.98 |
| J. Boat Rental Fees | 0 | 0 | ±0 |
| K. Other | 0.50 | 2.10 | ±0.73 |
| Totals | 30.50 | 22.90 | ±8.03 |

Table 5.35
Mean Trip Expenditures
Boat Fishing Parties
Eastern Pamlico Region

N = 51

Total Mean Trip Expenditure = $446.20

| Expense Category | Mean($) | S.D. | C.I. |
|---|---|---|---|
| A. Gas/Oil Boat | 43.30 | 41.20 | ± 9.49 |
| B. Gas/Oil Car | 113.20 | 210.40 | ±48.46 |
| C. Lodging | 119.20 | 171.40 | ±39.48 |
| D. Bait/Tackle | 27.20 | 54.50 | ±12.55 |
| E. Meals | 25.40 | 40.40 | ± 9.31 |
| F. Groceries | 60.10 | 64.30 | ±14.80 |
| G. Alcoholic Bev. | 29.30 | 99.50 | ±22.90 |
| H. Launch Fees | 18.30 | 30.30 | ± 6.98 |
| I. Repairs | 5.90 | 23.10 | ± 5.32 |
| J. Boat Rental Fees | 1.20 | 8.40 | ± 1.93 |
| K. Other | 2.90 | 11.20 | ± 2.58 |
| Totals | 446.20 | 541.20 | ±124.66 |

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Region Two - Croatan-Roanoke Region

The trip expenditures for fishing parties in the Croatan-Roanoke Region averaged $178.60. The largest expense was lodging, accounting for 29.4 percent of the total trip expenses, or $52.50. Other expenditures were: gas and oil for transporting vehicles 28.8 percent, groceries 13.5 percent and consumables (meats, groceries and beverages) 23.6 percent (See Table 5.31).

Region Three - Oregon Inlet Region

The trip expenditures for fishing parties in the Oregon Inlet Region averaged $261.80. The major expense was lodging, which accounted for 26.1 percent of the total trip expenses. Gas and oil for the boat accounted for 16.7 percent of the expenses. Expenses for food and beverages accounted for 32.3 percent of total trip expenses (See Table 5.32).

Region Four - Western Pamlico Region

The trip expenditures for the western Pamlico region averaged $73.90. The top two expenses in this region were gas and oil for transporting vehicles (24.3 percent) and for the boat (24.2 percent). Groceries accounted for 12.9 percent of the total expenses. The total for consumables was 26 percent of the expenses (See Table 5.3).

Region Five - Neuse River

The average total trip expenditure for the Neuse River area was $30.50. The two major expenses for this region were those of gas and oil for the boat (32.8 percent) and for the transporting vehicles (30.5 percent). Next came groceries at 11.4 percent of the total. Consumables represented 22.3 percent of total expenses (See Table 5.34).

Region Six - Eastern Pamlico

Expenditures reported by fishermen in the eastern Pamlico region were the highest of any of the six research regions. The total trip expenditure averaged $446.20. The major expense was lodging. It accounted for 26.7 percent of the total trip expenses. The second largest expense was gas and oil for the boat (25.4 percent or $113.20). Food and beverages, including restaurant meals, accounted for 25.7 percent of the total trip expenses totaling an average of $114.80 (See Table 5.35).

**Bank Fishing Party Expenditures**

Again we saw regional differences in the expenditures of bank fishing parties. The differences were based on place of residence and distance traveled to the fishing site.

Total Trip Expenditures by Category of Expense

The average fishing trip expenditures for bank fishing parties is given in Tables 5.36 through 5.38. There was a high degree of variance in average expenditures from region to region.

The largest expenditure category for the 1982 bank fishing party sample was lodging. Next came gas and oil for transporting vehicles at $32.40, restaurant meals at $29.00, groceries at $28.80, bait and tackle at $14.28, alcoholic beverages at $6.18, and other expenses at $2.92. Some money was spent on launching, storage and marina fees and gas and oil for boats. Although this was a bank fishing sample, inclimate weather forced boat fishing parties to the banks at some point during the fishing trip. Therefore, some boat-related costs were incurred. We must again caution that these averages display a high degree of variance (note the standard deviations). A breakdown of expenditures by category for bank fishing parties is presented in Tables 5.39A-K, 5.40A-K, and 5.41A-K.

Table 5.36
Total Trip Expenses - Bank Fishing Parties
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 11.00 | 21.10 | 28 |
| Croatan/Roanoke | 418.20 | 438.10 | 45 |
| Oregon Inlet | 265.20 | 280.10 | 14 |
| Western Pamlico | 20.40 | 38.10 | 30 |
| Neuse River | 9.80 | 8.70 | 16 |
| Eastern Pamlico | - | - | - |

Table 5.37
Total Trip Expenses - Bank Fishing Parties
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 103.00 | 133.20 | 4 |
| Croatan/Roanoke | 339.40 | 375.90 | 34 |
| Oregon Inlet | 426.70 | 358.45 | 10 |
| Western Pamlico | 102.80 | 222.70 | 17 |
| Neuse River | 11.30 | 13.60 | 9 |
| Eastern Pamlico | 5.00 | 7.10 | 2 |
| Totals | 237.90 | 308.60 | 76 |

Table 5.38
Total Trip Expenditures - Bank Fishing Parties
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 22.50 | 55.40 | 32 |
| Croatan/Roanoke | 384.30 | 411.80 | 79 |
| Oregon Inlet | 332.50 | 318.20 | 24 |
| Western Pamlico | 50.20 | 140.60 | 47 |
| Neuse River | 10.30 | 10.50 | 25 |
| Eastern Pamlico | - | - | - |

Table 5.39A
Trip Expenditures - Bank Fishing Parties
Gas and Oil for Boat
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 3.10 | 11.40 | 28 |
| Croatan/Roanoke | 0 | 0 | 45 |
| Oregon Inlet | 0 | 0 | 14 |
| Western Pamlico | 0.33 | 1.80 | 30 |
| Neuse River | 0 | 0 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |
| Totals | 0.70 | 5.30 | 134 |

Table 5.39B
Trip Expenditures - Bank Fishing Parties
Gas and Oil for Transporting Vehicle
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 4.10 | 8.20 | 28 |
| Croatan/Roanoke | 63.10 | 76.70 | 45 |
| Oregon Inlet | 42.30 | 38.40 | 14 |
| Western Pamlico | 60.60 | 7.90 | 30 |
| Neuse River | 4.10 | 5.10 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |
| Totals | 28.40 | 47.00 | 133 |

Table 5.39C
Trip Expenditures - Bank Fishing Parties
Lodging - Motel and Camping Fees
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 28 |
| Croatan/Roanoke | 173.80 | 209.00 | 45 |
| Oregon Inlet | 124.20 | 194.40 | 14 |
| Western Pamlico | 2.50 | 13.70 | 30 |
| Neuse River | 0 | 0 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.39D
Trip Expenditures - Bank Fishing Parties
Bait and Tackle
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.20 | 3.80 | 28 |
| Croatan/Roanoke | 25.40 | 67.80 | 45 |
| Oregon Inlet | 9.40 | 10.50 | 14 |
| Western Pamlico | 5.10 | 4.70 | 30 |
| Neuse River | 2.30 | 2.30 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.39E
Trip Expenditures - Bank Fishing Parties
Restaurant Meals
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.20 | 0.90 | 28 |
| Croatan/Roanoke | 70.50 | 93.60 | 45 |
| Oregon Inlet | 22.20 | 45.40 | 14 |
| Western Pamlico | 0.20 | 2.20 | 30 |
| Neuse River | 1.70 | 2.80 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.39F
Trip Expenditures - Bank Fishing Parties
Groceries, Including Ice
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.80 | 3.10 | 28 |
| Croatan/Roanoke | 51.10 | 73.50 | 45 |
| Oregon Inlet | 42.10 | 55.50 | 14 |
| Western Pamlico | 3.50 | 10.90 | 30 |
| Neuse River | 1.10 | 1.50 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.39G
Trip Expenditures - Bank Fishing Parties
Beer or Other Alcoholic Beverages
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.40 | 1.20 | 28 |
| Croatan/Roanoke | 17.30 | 36.00 | 45 |
| Oregon Inlet | 12.10 | 24.40 | 14 |
| Western Pamlico | 0.20 | 0.70 | 30 |
| Neuse River | 0.30 | 1.30 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.39H
Trip Expenditures - Bank Fishing Parties
Launching, Storage, and Marina Fees

1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0.20 | 0.90 | 28 |
| Croatan/Roanoke | 0 | 0 | 45 |
| Oregon Inlet | 0 | 0 | 14 |
| Western Pamlico | 0.50 | 2.70 | 30 |
| Neuse River | 0 | 0 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.39I
Trip Expenditures - Bank Fishing Parties
Repairs to Boat, Motor, Gear
1981

N/A

Table 5.39J
Trip Expenditures - Bank Fishing Parties
Boat Charter, Rental, or Party Boat Fees
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 28 |
| Croatan/Roanoke | 4.70 | 18.00 | 45 |
| Oregon Inlet | 5.10 | 16.10 | 14 |
| Western Pamlico | 0 | 0 | 30 |
| Neuse River | 0 | 0 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.39K
Trip Expenditures - Bank Fishing Parties
Other Expenses
1981

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 28 |
| Croatan/Roanoke | 12.20 | 47.70 | 45 |
| Oregon Inlet | 7.80 | 17.70 | 14 |
| Western Pamlico | 1.00 | 4.80 | 30 |
| Neuse River | 0.30 | 1.30 | 16 |
| Eastern Pamlico | 0 | 0 | 0 |

Table 5.40A
Trip Expenditures - Bank Fishing Parties
Gas and Oil for Boat
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 4 |
| Croatan/Roanoke | 0.90 | 5.10 | 34 |
| Oregon Inlet | 0 | 0 | 10 |
| Western Pamlico | 0.30 | 1.20 | 17 |
| Neuse River | 0 | 0 | 9 |
| Eastern Pamlico | 0 | 0 | 2 |
| Totals | 0.50 | 3.60 | 76 |

Table 5.40B
Trip Expenditures - Bank Fishing Parties
Gas and Oil for Transporting Vehicle
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 41.50 | 56.30 | 4 |
| Croatan/Roanoke | 45.40 | 53.10 | 34 |
| Oregon Inlet | 38.20 | 17.80 | 10 |
| Western Pamlico | 51.50 | 97.00 | 17 |
| Neuse River | 3.40 | 3.10 | 9 |
| Eastern Pamlico | 1.50 | 2.10 | 2 |
| Totals | 39.50 | 60.50 | 76 |

Table 5.40C
Trip Expenditures - Bank Fishing Parties
Lodging - Motel and Camping Fees
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 12.00 | 16.10 | 4 |
| Croatan/Roanoke | 145.90 | 228.80 | 34 |
| Oregon Inlet | 181.40 | 234.90 | 10 |
| Western Pamlico | 1.80 | 7.30 | 17 |
| Neuse River | 0 | 0 | 9 |
| Eastern Pamlico | 0 | 0 | 2 |
| Totals | 90.10 | 178.30 | 76 |

Table 5.40D
Trip Expenditures - Bank Fishing Parties
Bait and Tackle
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 7.00 | 12.00 | 4 |
| Croatan/Roanoke | 19.60 | 21.00 | 34 |
| Oregon Inlet | 76.70 | 184.50 | 10 |
| Western Pamlico | 6.30 | 7.80 | 17 |
| Neuse River | 3.70 | 6.20 | 9 |
| Eastern Pamlico | 0.50 | 0.70 | 2 |
| Totals | 21.10 | 67.90 | 76 |

Table 5.40E
Trip Expenditures - Bank Fishing Parties
Restuarant Meals
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 23.00 | 40.80 | 4 |
| Croatan/Roanoke | 60.30 | 101.90 | 34 |
| Oregon Inlet | 32.20 | 38.30 | 10 |
| Western Pamlico | 2.60 | 9.70 | 17 |
| Neuse River | 3.90 | 11.70 | 9 |
| Eastern Pamlico | 0 | 0 | 2 |
| Totals | 33.50 | 72.10 | 76 |

Table 5.40F
Trip Expenditures - Bank Fishing Parties
Groceries, Including Ice
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 14.50 | 15.20 | 4 |
| Croatan/Roanoke | 45.90 | 97.10 | 34 |
| Oregon Inlet | 75.30 | 83.70 | 10 |
| Western Pamlico | 37.60 | 120.50 | 17 |
| Neuse River | 0.30 | 1.00 | 9 |
| Eastern Pamlico | 1.50 | 2.10 | 2 |
| Totals | 39.70 | 93.20 | 76 |

Table 5.40G
Trip Expenditures - Bank Fishing Parties
Beer or Other Alcoholic Beverages
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 5.00 | 10.00 | 4 |
| Croatan/Roanoke | 12.60 | 19.20 | 34 |
| Oregon Inlet | 16.70 | 12.00 | 10 |
| Western Pamlico | 0.70 | 2.30 | 17 |
| Neuse River | 0 | 0 | 9 |
| Eastern Pamlico | 1.50 | 2.10 | 2 |
| Totals | 8.30 | 14.10 | 76 |

Table 5.40H
Trip Expenditures - Bank Fishing Parties
Launching, Storage, and Marina Fees
1982

No Expenditures

Table 5.40I
Trip Expenditures - Bank Fishing Parties
Repairs to Boat, Motor, Gear
1982

No Expenditures

Table 5.40J
Trip Expenditures - Bank Fishing Parties
Boat Charter, Rental, or Party Boat Fees
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 4 |
| Croatan/Roanoke | 6.55 | 27.30 | 34 |
| Oregon Inlet | 3.00 | 9.50 | 10 |
| Western Pamlico | 2.10 | 8.50 | 17 |
| Neuse River | 0 | 0 | 9 |
| Eastern Pamlico | 0 | 0 | 2 |
| Totals | 3.80 | 19.50 | 76 |

Table 5.40K
Trip Expenditures - Bank Fishing Parties
Other Expenses
1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 4 |
| Croatan/Roanoke | 2.20 | 6.80 | 34 |
| Oregon Inlet | 3.20 | 7.00 | 10 |
| Western Pamlico | 0 | 0 | 17 |
| Neuse River | 0 | 0 | 9 |
| Eastern Pamlico | 0 | 0 | 2 |
| Totals | 1.40 | 5.30 | 76 |

Table 5.41A
Trip Expenditures - Bank Fishing Parties
Gas and Oil for Boat
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.70 | 10.70 | 32 |
| Croatan/Roanoke | 0.40 | 3.40 | 79 |
| Oregon Inlet | 0 | 0 | 24 |
| Western Pamlico | 0.30 | 3.40 | 47 |
| Neuse River | 0 | 0 | 25 |
| Eastern Pamlico | 0 | 0 | 3 |
| Totals | 0.60 | 4.80 | 210 |

Table 5.41B
Trip Expenditures - Bank Fishing Parties
Gas and Oil for Transporting Vehicle
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 8.80 | 22.90 | 32 |
| Croatan/Roanoke | 55.50 | 67.80 | 79 |
| Oregon Inlet | 40.60 | 40.00 | 24 |
| Western Pamlico | 22.80 | 61.60 | 47 |
| Neuse River | 3.90 | 4.50 | 25 |
| Eastern Pamlico | 1.00 | 1.70 | 3 |
| Totals | 32.40 | 56.20 | 210 |

Table 5.41C
Trip Expenditures - Bank Fishing Parties
Lodging - Motel and Camping Fees
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 1.50 | 6.40 | 32 |
| Croatan/Roanoke | 161.80 | 216.70 | 79 |
| Oregon Inlet | 148.00 | 209.20 | 24 |
| Western Pamlico | 2.20 | 11.70 | 47 |
| Neuse River | 0 | 0 | 25 |
| Eastern Pamlico | - | - | - |
| Totals | 62.70 | - | 207 |

Table 5.41D
Trip Expenditures - Bank Fishing Parties
Bait and Tackle
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.80 | 5.40 | 32 |
| Croatan/Roanoke | 22.90 | 52.80 | 79 |
| Oregon Inlet | 37.40 | 120.60 | 24 |
| Western Pamlico | 5.50 | 6.00 | 47 |
| Neuse River | 2.80 | 4.10 | 25 |
| Eastern Pamlico | - | - | - |
| Totals | 14.28 | - | 207 |

Table 5.41E
Trip Expenditures - Bank Fishing Parties
Restaurant Meals
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 3.00 | 14.90 | 32 |
| Croatan/Roanoke | 66.10 | 96.70 | 79 |
| Oregon Inlet | 26.40 | 42.00 | 24 |
| Western Pamlico | 1.40 | 6.00 | 47 |
| Neuse River | 2.50 | 7.20 | 25 |
| Eastern Pamlico | 0 | 0 | 0 |
| Totals | 29.00 | 68.00 | 210 |

Table 5.41F
Trip Expenditures - Bank Fishing Parties
Groceries, Including Ice
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 2.50 | 7.20 | 32 |
| Croatan/Roanoke | 48.90 | 83.90 | 79 |
| Oregon Inlet | 55.90 | 69.00 | 24 |
| Western Pamlico | 15.90 | 73.50 | 47 |
| Neuse River | 0.80 | 1.40 | 25 |
| Eastern Pamlico | 1.00 | 1.70 | 3 |
| Totals | 28.80 | 69.50 | 210 |

Table 5.41G
Trip Expenditures - Bank Fishing Parties
Beer or other Alcoholic Beverages
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 1.00 | 3.60 | 32 |
| Croatan/Roanoke | 15.30 | 29.90 | 79 |
| Oregon Inlet | 14.00 | 19.90 | 24 |
| Western Pamlico | 0.40 | 1.50 | 47 |
| Neuse River | 0.20 | 1.00 | 25 |
| Eastern Pamlico | - | - | - |
| Totals | 6.18 | - | 207 |

Table 5.41H
Trip Expenditures - Bank Fishing Parties
Launching, Storage, and Marina Fees
1982

No Expenditures

Table 5.41I
Trip Expenditures - Bank Fishing Parties
Repairs to Boat, Motor, Gear

No Expenditures

Table 5.41J
Trip Expenditures - Bank Fishing Parties
Boat Charter, Rental, or Party Boat Fees
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 32 |
| Croatan/Roanoke | 5.50 | 22.40 | 79 |
| Oregon Inlet | 4.30 | 13.50 | 24 |
| Western Pamlico | 0.70 | 5.10 | 47 |
| Neuse River | 0 | 0 | 25 |
| Eastern Pamlico | 0 | 0 | 3 |
| Totals | 2.70 | 14.80 | 210 |

Table 5.41K
Trip Expenditures - Bank Fishing Parties
Other Expenses
1981-1982

| Region | Mean ($) | S.D. | N= |
|---|---|---|---|
| Albemarle | 0 | 0 | 32 |
| Croatan/Roanoke | 7.90 | 36.50 | 79 |
| Oregon Inlet | 5.90 | 14.20 | 24 |
| Western Pamlico | 0.60 | 3.80 | 47 |
| Neuse River | 0.20 | 1.00 | 25 |
| Eastern Pamlico | - | - | - |
| Totals | 2.92 | - | 207 |

Region One - Albemarle Sound Region

The total trip expenditures for bank fishing parties in the Albemarle region averaged $22.50. The largest expense incurred by these fishermen was for gas and oil for the vehicle. This totaled 39.1 percent of the total costs. Next came bait and tackle costs at 12.4 percent, gas and oil for the boat, and consumables (See Table 5.42).

Table 5.42
Mean Trip Expenditures, Bank Fishing Parties
Albemarle Region

N = 32
Total Mean Trip Expenditure = $22.50

| Expense Category | Mean ($) | S.D. |
|---|---|---|
| A. Gas/Oil Boat | 2.70 | 10.70 |
| B. Gas/Oil Car | 8.80 | 22.90 |
| C. Lodging | 1.50 | 6.40 |
| D. Bait/Tackle | 2.80 | 5.40 |
| E. Meals | 3.00 | 14.90 |
| F. Groceries | 2.50 | 7.20 |
| G. Alcoholic Beverages | 1.00 | 3.60 |
| H. Launch Fees | .20 | .90 |
| I. Repairs | - | - |
| J. Boat Rental Fees | 0 | 0 |
| K. Other | 0 | 0 |
| Totals | 22.50 | - |

Region Two - Croatan-Roanoke Region

Bank fishermen in this region incurred the greatest costs for their fishing trip. The average trip expenditure was $384.30. The largest expense was lodging. This accounted for 42.1 percent of the total trip expenditures with an average outlay of $161.80. Next came restaurant meals at 17.2 percent of the total trip expenses, followed by gas and oil costs for the transporting vehicle at 14.4 percent. Consumables, including meals,

groceries and beverages, accounted for 33.9 percent of the total trip costs (See Table 5.43).

Table 5.43
Mean Trip Expenditures, Bank Fishing Parties
Croatan/Roanoke Region

N=29
Total Mean Trip Expenditures = $384.30

| Expense Category | Mean ($) | S.D. |
|---|---|---|
| A. Gas/Oil Boat | 0.40 | 3.40 |
| B. Gas/Oil Car | 55.50 | 67.80 |
| C. Lodging | 161.80 | 216.70 |
| D. Bait/Tackle | 22.90 | 52.80 |
| E. Meals | 66.10 | 96.70 |
| F. Groceries | 48.90 | 83.90 |
| G. Alcoholic Beverages | 15.30 | 29.90 |
| H. Launch Fees | 0 | 0 |
| I. Repairs | - | - |
| J. Boat Rental Fees | 5.50 | 22.40 |
| K. Other | 7.90 | 36.50 |
| Total | 384.30 | - |

Region Three - Oregon Inlet Region

At Oregon Inlet, bank fishing parties spent an average of $332.50. The largest expense was lodging, at 44.5 percent of the total trip expenditures, followed by groceries at 16.8 percent of the total. Consumables accounted for 28.9 percent of the total trip expenses (See Table 5.44).

Table 5.44
Mean Trip Expenditures, Bank Fishing Parties
Oregon Inlet Region

N=24
Total Mean Trip Expenditure = $332.50

| Expense Category | Mean ($) | S.D. |
|---|---|---|
| A. Gas/Oil Boat | 0 | 0 |
| B. Gas/Oil Car | 40.60 | 40.00 |
| C. Lodging | 148.00 | 209.20 |
| D. Bait/Tackle | 37.40 | 120.60 |
| E. Meals | 26.40 | 42.00 |
| F. Groceries | 55.90 | 69.00 |
| G. Alcoholic Beverages | 14.00 | 19.90 |
| H. Launch Fees | 0 | 0 |
| I. Repairs | - | - |
| J. Boat Rental Fees | 4.30 | 13.50 |
| K. Other | 5.90 | 14.20 |
| Total | 332.50 | - |

Region Four - Western Pamlico Region

The total trip expenditures for fishing parties in this region averaged $50.20. The largest expense was on gas and oil for the transporting vehicle at 45 percent of the total trip expenses. Next came groceries at 31.7 percent of the total trip expenses. Consumables accounted for 35.3 percent of the total expenses (See Table 5.45).

Table 5.45
Mean Trip Expenditures, Bank Fishing Parties
Western Pamlico Region

N=47
Total Mean Trip Expenditure = $50.20

| Expense Category | Mean ($) | S.D. |
|---|---|---|
| A. Gas/Oil Boat | .30 | 3.40 |
| B. Gas/Oil Car | 22.80 | 67.80 |
| C. Lodging | 2.20 | 11.70 |
| D. Bait/Tackle | 5.50 | 6.00 |
| E. Meals | 1.40 | 6.00 |
| F. Groceries | 15.90 | 73.50 |
| G. Alcoholic Beverages | 0.40 | 1.50 |
| H. Launch Fees | 0.30 | 2.20 |
| I. Repairs | - | - |
| J. Boat Rental Fees | 0.70 | 5.10 |
| K. Other | 0.60 | 3.80 |
| Total | 50.20 | - |

Region Five - Neuse River Region

The trip expenditures for bank fishing parties in the Neuse River region was the lowest for the six sampled regions. The average trip expenditure was $10.30. The largest expense was costs incurred for gas and oil for the transporting vehicle at 37.9 percent of the total trip expenses. Bait and tackle accounted for 27.2 percent of the total; food and beverages, for 33.9 percent (See Table 5.46).

Table 5.46
Mean Trip Expenditures, Bank Fishing Parties
Neuse River Region

N=25
Total Mean Trip Expenditure = $10.30

| Expense Category | Mean ($) | S.D. |
|---|---|---|
| A. Gas/Oil Boat | 0 | 0 |
| B. Gas/Oil Car | 3.90 | 4.50 |
| C. Lodging | 0 | 0 |
| D. Bait/Tackle | 2.80 | 4.10 |
| E. Meals | 2.50 | 7.20 |
| F. Groceries | 0.80 | 1.40 |
| G. Alcoholic Beverages | 0.20 | 1.00 |
| H. Launch Fees | 0 | 0 |
| I. Repairs | - | - |
| J. Boat Rental Fees | 0 | 0 |
| K. Other | 0.20 | 1.00 |
| Total | 10.30 | - |

Region Six - Eastern Pamlico

Total trip expenditures for fishing parties in the eastern Pamlico region could not be calculated because of an insufficient sample size.

# CHAPTER 6
# THE FISHING EXPERIENCE

## Introduction

Marine recreational fishing in eastern North Carolina is carried on in a variety of ways and in a variety of ecosystems. The family fishing from the beach at Sandy Point in the Albemarle Sound or Minnesott Beach on the Neuse River may use a rod and reel, a small gill net or handlines. In salty sound waters, gigging for flounder and hand lining crabs are part of the recreational fishing experience.

Earlier, we saw that the fishing population falls into four distinguishable subsets. Boat fishermen may be characterized as locals or tourists. Locals drive to a site within their county or a neighboring county and fish for a few hours or a day. Tourists travel some distance to a preferred fishing ground, stay a weekend or longer, and are the principal users of the Outer Banks. Similarly, we can distinguish between locals and tourists among our bank fishermen.

The fishing experiences of these groups are differ qualitatively and quantitatively. Larger boats and more expenditures are related to fishing along the Outer Banks. Fishermen in this area are mostly tourists. For fishermen in the Albemarle, western Pamlico, Neuse and Pamlico River regions, fishing is part of their normal lifestyle of the region. Moreover, women and blacks participate in the bank fishery.

In this chapter, we will examine the fishing experience. The factors that contribute to enjoyment of or dissatisfaction with the fishing trip will be discussed. We will look at the alternatives to fishing and fishermen's preferences for launching and fishing sites.

The bank fishermen sampling procedures varied slightly between 1981 and 1982. In 1981, we sampled throughout the region. But in 1982, the survey was concentrated in the eastern part and Outer Banks. Thus, differences may arise due to a greater proportion of tourists.

## The Enjoyment of Fishing

All sections and subsections of our sample showed a high level of satisfaction with their fishing trip (see Tables 6.1 and 6.2). More than half of all bank and boat fishermen indicated that they enjoyed the day's fishing trip very much. Another 39 percent of bank fishermen and 36 percent of the boat fishermen indicated that they simply enjoyed their fishing. Only about 8 percent of both groups were either dissatisfied or ambivalent about their fishing experience.

Table 6.1. Enjoyment of the Day's Fishing Trip - Bank Fisherman

| Enjoyment | 1981 (N=233) % | | 1982 (N=74) % | | 1981/82 % | |
|---|---|---|---|---|---|---|
| Yes, very much | 49.8 | 90.1 | 58.1 | 94.6 | 51.8 | 91.2 |
| Yes | 40.3 | | 36.5 | | 39.4 | |
| Satisfactory | 4.3 | | 4.1 | | 4.2 | |
| No | 3.9 | | 1.4 | | 3.3 | |
| Not at all | 0.9 | | - | | 0.7 | |
| No response | 0.9 | | - | | 0.7 | |
| | 100.0 | | 100.00 | | 100 | |

*Percentages are rounded.

Table 6.2. Enjoyment of the Day's Fishing Trip - Boat Fishermen

| Enjoyment | 1981 (N=594) %* | | 1982 (N=311) % | | 1981/82 % | |
|---|---|---|---|---|---|---|
| Yes, very much | 52.2 | 89.6 | 55.9 | 91.6 | 53.5 | 90.3 |
| Yes | 37.4 | | 35.7 | | 36.8 | |
| Satisfactory | 3.2 | | 2.6 | | 3.0 | |
| No | 4.2 | | 3.5 | | 4.0 | |
| Not at all | 0.3 | | 0.3 | | 0.3 | |
| No response | 2.6 | | 1.9 | | 2.5 | |

*Percentages are rounded.

Analyzing the responses in the manner of Spaulding (1976), we find that nearly 40 percent of the satisfied fishermen valued the experience because it involved action. A similar proportion valued the experience because of relationships with others or the environment. Some 20 percent of bank and boat fishermen emphasized integrative values of a personal nature (see Tables 6.2.3 and 6.2.4). And 20 percent said catching fish was the largest source of satisfaction.

Table 6.3. "What Made the Fishing Trip Enjoyable?" - Bank Fishermen*

| Value | 1981 (N=176) %** | 1982 (N=49) % | 1981&82(N-225) % |
|---|---|---|---|
| Catching fish | 16.5 | 24.5 | 18.2 |
| Experiencing excitement, tension or relaxation | 21.5 | 28.5 | 23.1 |
| Involvement with the environment | 28.4 | 28.5 | 28.4 |
| Interpersonal relationships | 8.5 | 14.2 | 9.7 |
| Experiencing transition (reduction in stress) | 11.4 | -- | 8.9 |
| Integrative response (e.g., thinking things through) | 13.6 | 4.1 | 11.5 |
| | 100.0 | 100.0 | 100.0 |

*Single responses to the question only.
**Percentages are rounded.

Table 6.4. "What Made the Fishing Trip Enjoyable?" - Boat Fishermen*

| Value | 1981 (N=464) %** | 1982 (N=174) % | 1981&82(N=638) % |
|---|---|---|---|
| Catching fish | 19.2 | 24.7 | 20.7 |
| Experiencing excitement, tension or relaxation | 19.8 | 21.3 | 20.2 |
| Involvement with the environment | 28.9 | 31.6 | 29.6 |
| Interpersonal relationships | 10.1 | 8.0 | 9.6 |
| Experiencing transition (from one state of mind to another) | 12.7 | 4.0 | 10.3 |
| Integrative responses (e.g., thinking things through) | 9.3 | 10.3 | 9.6 |
| | 100.0 | 100.0 | 100.0 |

*Single responses to the question only.
**Percentages are rounded.

The excitement of catching fish releases tension and reaffirms skills and cultural values. In rural eastern North Carolina, hunting and fishing are seasonal activities for locals. For tourists, they are part of a return to the cultural roots of their childhood or community.

Catching fish is not the only action important to anglers, although it is the most important. Fishermen also want to experience or seek excitement, tension or relaxation, often in a different environment or role. Fishermen expressed these ideas about what made the day's fishing enjoyable:

"Getting out and doing something different."

"The challenge and sport of fishing."

"Getting away from my wife."

"Being where I don't hear the everyday grind of the job."

"Getting away from work and family with the guys."

Fishing adds variety to a fisherman's life that is important socially and personally. In particular, the emphasis on masculine activities among boat fishermen may provide a social counterbalance to a work-a-day world of equal opportunity and equal rights.

The second group of values, those concerned with relationships, are more complex. The relationship with the environment is expressed in terms such as this:

"Just being on the water. It's not for the fish, they're cheaper to buy."

"A chance to get out on the water."

"I'm a saltwater fan having a chance to get to saltwater."

"Enjoying the ocean and the outdoors."

"Its a nice day."

Enjoyment of the environment may suggest that some anglers use fishing as an excuse for spending time outside. That may be so, but the relationship of man with his environment is a complex one. Renewal of contact is important in reaffirmation of self.

Relationships with others are also renewed and reaffirmed during a fishing trip. Few anglers fished alone; fishing is a social activity in the sounds of eastern North Carolina. Nearly 10 percent of the fishermen interviewed (see Tables 6.3 and 6.4) said that company of relatives or friends made the trip enjoyable.

The third pattern of responses, those termed by Spaulding (1976) as integrative, were expressions of individual enjoyment and satisfaction of individual needs. The transition from stressful to non-stressful states is not the same transition sought by the action group of respondents. The integrative pattern seeks internal satisfaction - peace, quiet - rather than external activity. Pleasure expressed at solitary activity, of being on the boat, of having no stress and relaxing, marks this group of respondents.

Other fishermen responded to our question with several values or activities. Of the bank fishermen, 17 percent gave multiple answers to the question. A similar proportion, 18 percent of boat fishermen gave compound responses. Examples of this type of response include:

"Caught fish, no breakdowns;"

"Nice weather, fish, good companionship;"

"Company, drinking beer and such;"

"Like fishing, nice pier out here, cool out here;"

"Good weather, fish biting, no telephones;" and

"I ain't got nothing else to do, go; s'pose I'll enjoy it and it's something to kill time."

We were also interested in what attracted fishermen to their sport and what they sought from their activity. See Tables 6.5 and 6.6. If we use Spaulding's typology, nearly 75 percent of both groups sought action.

Fishermen answering this question placed greater emphasis upon catching fish. With the previous question, some 20 percent of the respondents said that satisfaction was due to catching fish. With this general question, 38 percent of the boat fishermen and 46 percent of the bank fishermen said the thing they enjoyed most about fishing was catching fish. This is the purpose of taking part in the sport. But the displacement of this goal in the enjoyment of a trip suggests that Spaulding and Bryan were correct in their assumptions that fishing had levels of satisfaction, specialization and function for society and the individual.

Table 6.5. "What Do You Most Enjoy About Fishing?" - Boat Fishermen*

| Values | 1981 (N=491) %** | 1982 (N=223) % | 1981&82 (N=714) % |
|---|---|---|---|
| Catching fish | 38.5 | 39.0 | 38.7 |
| Being outdoors | 11.9 | 12.5 | 12.0 |
| Getting away | 24.8 | 26.0 | 25.2 |
| Challenge/sport | 10.2 | 9.0 | 9.8 |
| Solitude; peace and quiet | 4.3 | 2.7 | 3.8 |
| Good weather | -- | -- | -- |
| Fishing with family | 0.6 | 0.4 | 0.6 |
| Fishing with friends; companionship | 2.6 | 1.8 | 2.4 |
| Everything about the fishing experience | 7.1 | 8.5 | 7.6 |
| | 100.0 | 100.0 | 100.0 |

*Only single responses to the questions were analyzed.
**Percentages are rounded.

Table 6.6. "What Do You Most Enjoy About Fishing?" - Bank Fishermen*

| Values | 1981 (N=190) %** | 1982 (N=49) % | 1981&82 (N=23%) % |
|---|---|---|---|
| Catching fish | 49.4 | 32.6 | 46.0 |
| Being outdoors | 11.6 | 10.2 | 11.3 |
| Getting away | 17.4 | 30.6 | 20.1 |
| Challenge/sport | 8.4 | 16.3 | 10.0 |
| Solitude; peace and quiet | 4.7 | 8.2 | 5.4 |
| Good weather | 0.5 | 2.0 | 1.0 |
| Fishing with family | 0.5 | --- | 0.5 |
| Fishing with friends; companionship | 2.1 | --- | 1.7 |
| Everything about the fishing experience | 5.3 | --- | 4.2 |
| | 100.00 | 100.0 | 100.0 |

*Only single responses to the question were analyzed.
**Percentages are rounded.

In these generalized, ideal-type questions, the lack of emphasis upon social relationships with family and/or friends is noteworthy. Of the boat fishermen, 3 percent viewed fishing with kin or friends as the most enjoyable aspect of the activity; a smaller proportion of the bank fishermen responded in the same way. After the fishing trip, approximately three times as many fishermen viewed the company of kin and/or friends as the most enjoyable factor in the trip.

We can view recreational fishing from a dual perspective. On one hand, the enjoyment of the fishing trip is related to the action and activities associated with catching fish. In looking forward to fishing, bank and boat fishermen viewed catching fish, getting away, and the challenge and sport of fishing as important elements. In the single responses to this question, the action elements ranked first, second and fourth. Being outdoors, a relationship element, ranked third. In satisfaction

derived from the trip, action elements accounted for only two-fifths of the enjoyment obtained by fishermen. Relationship elements also accounted for some two-fifths of the responses.

## Dissatisfaction of Recreational Fishermen with Their Sport

Approximately 8 percent of these marine recreational fishermen interviewed did not enjoy their fishing trip. Sixteen bank fishermen and 54 boat fishermen form the sample because they gave reasons for their lack of enjoyment. This group represents approximately two-thirds of all those in the sample who did enjoy fishing, responding that they had not enjoyed their trip. Given the small size of the sample, only the most general conclusions can be drawn.

Table 6.7 shows the responses of boat and bank fishermen to the question: "What made the trip enjoyable?" Approximately 56 percent of the dissatisfied anglers were unhappy because no fish had been caught. Bad weather was the reason cited by 13 percent of the dissatisfied fishermen, and boat or gear problems accounted for another 6 percent. A plethora of reasons was offered by the remaining fishermen. These ranged from poor company to no beer to crowded fishing sites.

Table 6.7 "What Made the Trip Unenjoyable?" - Bank and Boat Fishermen.

| Value | Bank Fishermen 1981-1982 (N=16)* % ** | Boat Fishermen 1981-1982 (N-54)* % ** |
|---|---|---|
| Not catching fish | 56.2 | 55.6 |
| Bad weather | 12.5 | 14.8 |
| Boat or gear problems | 6.2 | 5.6 |
| Poor company | 6.2 | 1.9 |
| Other | 18.8 | 22.2 |
| | 100.0 | 100.0 |

*N = 307 for all bank fishermen; 5.2% were dissatisfied respondents.
N = 905 for all boat fishermen, 6.0% were dissatisfied respondents.

**Percentages are rounded.

Then anglers were asked: "What do you most dislike about fishing?" The responses were similar to those of the fishermen dissatisfied with their trip. Approximately 53 percent of the bank fishermen (see Table 6.8) and 41 percent of the boat fishermen (see Table 6.9) indicated that they disliked not catching fish. A higher proportion of the boat fishermen disliked the expense of fishing (12 percent) and bad weather (11 percent) than did bank fishermen (3 percent and 4 percent respectively). Seven percent of the boat fishermen and 4 percent of the bank fishermen disliked cleaning or unhooking fish they had caught. Gear problems were a factor for 10 percent of the bank fishermen and 6 percent of the boat fishermen. Other dislikes were discourteous boaters, cleaning the boat, insects, and problems with bait.

Table 6.8 "What Do You Most Dislike About Fishing?" - Bank Fishermen*

| Value | 1981 (N=154) %** | 1982 (N=37) % | 1981&82 (N=191) % |
|---|---|---|---|
| Not catching fish | 51.9 | 56.8 | 52.9 |
| Unfavorable weather or water conditions | 4.5 | 2.7 | 4.2 |
| Expense | 3.2 | 2.7 | 3.1 |
| Cleaning and unloading fish | 5.2 | 2.7 | 4.7 |
| Cleaning boat or gear | 0.6 | -- | 0.5 |
| Discourteous boaters or fishermen | 2.6 | -- | 2.1 |
| Crowds | 2.6 | 5.4 | 3.1 |
| Bait (problems with) | 5.2 | 2.7 | 4.7 |
| Commercial fishermen or net fishing | -- | -- | -- |
| Boat or gear problems | 9.1 | 13.5 | 9.9 |
| Insects | 4.5 | -- | 3.7 |
| Distance from home | 3.2 | -- | 2.6 |
| Catching unwanted species | 4.5 | 5.4 | 4.7 |
| Time (boredom) | -- | 8.1 | 1.6 |
| Fishery regulations | -- | -- | -- |
| Pollution | 2.6 | -- | 2.1 |
| | 100.0 | 100.0 | 100.0 |

*Only single responses to the questions were analyzed; 54 fishermen (23 percent) in 1981 and 15 fishermen (20 percent) in 1982 did not dislike anything about fishing.

**Percentages are rounded.

Table 6.9 "What Do You Most Dislike About Fishing?" - Boat Fishermen*

| Value | 1981 (N=401) %** | 1982 (N=186) % | 1981&82 (N=587) % |
|---|---|---|---|
| Not catching fish | 40.1 | 44.1 | 41.4 |
| Unfavorable weather or water conditions | 10.5 | 12.9 | 11.2 |
| Expense | 14.2 | 8.6 | 12.4 |
| Cleaning and unhooking fish | 6.2 | 9.1 | 7.2 |
| Cleaning boat or gear | 1.7 | 3.8 | 2.4 |
| Discourteous boaters or sportsmen | 7.0 | 5.4 | 6.5 |
| Crowds | 1.2 | 3.8 | 2.0 |
| Bait (problems with) | 0.5 | 1.6 | 0.9 |
| Commercial fishermen or net fishing | 1.7 | 1.1 | 1.5 |
| Boat or gear problems | 7.5 | 2.2 | 5.8 |
| Insects | 0.7 | 1.1 | 0.9 |
| Distance from home | 2.2 | 4.3 | 2.9 |
| Catching unwanted species | 1.5 | 0.5 | 1.2 |
| Time (boredom) | 1.0 | 0.5 | 0.9 |
| Fishery regulations | 1.0 | 1.1 | 1.0 |
| Pollution | 1.5 | -- | 1.0 |
| Water level | 1.2 | -- | 0.9 |
| | 100.0 | 100.0 | 100.0 |

*Only single responses to the questions were analysed; 116 boat fishermen (19.5 percent) in 1981, and 52 boat fishermen (16.7 percent) in 1982, did not dislike anything about fishing.
**Percentages are rounded.

We noted earlier that the modal catch of a fishing trip in North Carolina is 0. Our satisfaction scale suggests that other factors can compensate for not catching fish. However, 18 percent of the boat fishermen and 22 percent of the bank fishermen said there was nothing they disliked about fishing. When we consider the number of fishermen whose principal dislike was not catching fish, we learn it is 243 boat fishermen (N=905) and 101 bank fishermen (N=307). Less than a third of all fishermen interviewed see not catching fish as a major problem, at least in the short term.

## Alternative Activities to Recreational Fishing

As part of the study, we wanted to learn what leisure alternatives a marine recreational fisherman would consider if he believed he would not catch a fish during a fishing trip. We found (Tables 6.10 and 6.11) that 30 percent of the bank fishermen and 33 percent of the boat fishermen would go fishing anyway but would target other species.

Table 6.10 "If You Knew in Advance That You Would Not Catch Any (Target Species) Today, What Would You Have Done Instead?" - Bank Fishermen

| Activity | 1981 (N=233) %* | 1982 (N=74) % | 1981&82 (N=307) % |
|---|---|---|---|
| Fished for other species | 27.0 | 39.2 | 30.0 |
| Boating | 0.4 | 1.4 | 0.7 |
| Other marine recreational activity | 5.6 | 5.4 | 5.5 |
| Nonmarine recreational activity | 7.7 | 10.8 | 8.5 |
| Worked | 1.3 | 1.4 | 1.3 |
| Stayed at home | 26.2 | 20.3 | 24.8 |
| Other activity | 4.7 | 17.6 | 7.8 |
| No Response/Don't Know | 27.0 | 4.1 | 21.5 |
| | 100.0 | 100.0 | 100.0 |

*Percentages are rounded.

Table 6.11 "If You Knew in Advance That You Would Not Catch Any (Target Species) Today, What Would You Have Done Instead?" - Boat Fishermen

| Activity | 1981 (N=594) %* | 1982 (N=311) % | 1981&82 (N=905) % |
|---|---|---|---|
| Fished for other species | 29.6 | 41.2 | 33.6 |
| Boating | 2.9 | 5.5 | 3.8 |
| Other marine recreational activity | 3.0 | 6.4 | 4.2 |
| Non marine recreational activity | 3.9 | 4.5 | 4.1 |
| Worked | 3.4 | 1.6 | 2.8 |
| Stayed at home | 29.3 | 30.5 | 4.8 |
| Other | 4.5 | 5.1 | 7.1 |
| No response/don't know | 23.4 | 5.1 | 7.1 |
| | 100.0 | 100.0 | 100.0 |

*Percentages are rounded.

Twenty-one percent of the bank fishermen and 17 percent of boat fishermen were undecided about alternatives. The rest of our sample would either stay at home (24 percent bank; 29 percent boat fishermen), engage in other marine recreational activities (6 percent bank; 8 percent boat), participate in a nonmarine activity (8 percent bank; 4 percent boat), or work (1 percent bank; 2 percent boat). This breakdown shows that marine recreational fishing is not viewed as directly substitutable for work.

## Fishing and Launching Site Preferences

The choice of a fishing site for the bank fisherman and the choice of a boat ramp or marina for the boat fisherman are important considerations in the fishing experience. One of the expressed dislikes about fishing was the distance of the fishing location from home. In this section, we will examine other factors in the choice of location. It should be noted

that bank fishermen are relatively immobile once a site has been chosen. In contrast, boat fisherman can move around the water seeking fish.

The bank fishermen prefer to fish from public piers or bridges (20 percent) or from river or sound banks (22 percent). [See Table 6.12]. Other unspecified sites attract his preference on occasion (11 percent), with a similar proportion of respondents preferring private piers or bridges. Beach fishing is preferred by only 8 percent of bank fishermen, presumably because of the shallowness of beaches surrounding the sounds.

Table 6.12 "Do You Have a Preference for Private Piers or Bridges?" - Bank Fishermen

| Preferred Site | 1981 (N=233) %* | 1982 (N=74) % | 1981&82 (N=307) % |
|---|---|---|---|
| Private pier or bridge, fees | 11.2 | 12.2 | 11.4 |
| Public pier or bridge, no fees | 18.5 | 25.7 | 20.2 |
| River bank | 23.2 | 21.6 | 22.8 |
| Beach | 8.6 | 9.5 | 8.8 |
| Other | 11.2 | 13.5 | 11.7 |
| No response/don't know | 27.5 | 17.6 | 25.1 |
| | 100.0 | 100.0 | 100.0 |

*Percentages are rounded.

Bank fishermen choose sites based on the accessibility of fish at the site (13 percent), no crowds/solitude (10 percent), and the expense (free or less expensive) (8 percent). Other reasons include the ability to move freely about the site, safety and security, comfort, and convenience. Fourteen percent of bank fishermen expressed no preference for fishing sites and 17 percent did not respond to the question (Tables 6.13 and 6.14).

Table 6.13 Bank Fishermen's Reasons for Preferring Fishing Sites.

| Reason for Choice of Fishing Site | 1981 (N=233) %* | 1982 (N=74) % | 1981&82 (N=307) % |
|---|---|---|---|
| Free/less expensive | 6.9 | 13.5 | 8.5 |
| More comfortable | 3.0 | -- | 2.3 |
| Convenient location | 2.1 | 2.7 | 2.3 |
| Fish more accessible | 15.5 | 5.4 | 13.0 |
| Nonconfining; fishermen can range freely | 4.3 | -- | 3.3 |
| No boat available | 3.4 | 1.4 | 2.9 |
| Safe/secure | 3.4 | 1.4 | 2.9 |
| No preference | 15.9 | 8.1 | 14.0 |
| Crowds/socialability | 2.6 | -- | 2.0 |
| No crowds/solitude | 9.9 | 12.2 | 10.4 |
| Dislike/fear of water | 1.3 | -- | 1.0 |
| Other | 15.5 | 35.1 | 20.2 |
| Don't know/no response | 16.3 | 20.3 | 17.2 |
| | 100.0 | 100.0 | 100.0 |

*Percentages are rounded.

Table 6.14 Bank Fishermen's Reasons for Preferring Fishing Sites by Choice of Sites.

| Reason for Choice of Fishing Site | Private Site (N=34) %* | Public Site (N=57) % | River Bank (N=59) % | Beach (N=24) % | Other (N=32) % |
|---|---|---|---|---|---|
| Free/less expensive | 2.9 | 33.3 | 8.5 | -- | -- |
| More comfortable | 5.9 | 1.8 | 5.1 | 4.2 | -- |
| Convenient location | 11.8 | -- | 3.4 | 4.2 | -- |
| Fish more accessible | 14.7 | 14.0 | 8.5 | 8.3 | 46.9 |
| Nonconfining; fishermen can range freely | 2.9 | -- | 10.2 | 8.3 | 3.1 |
| No boat available | 2.9 | -- | 13.6 | -- | -- |
| Safe/secure | 5.9 | 3.5 | 5.1 | 4.2 | 3.1 |
| No preference | -- | -- | 1.7 | -- | 6.3 |
| Crowds/sociability | -- | 7.0 | -- | 8.3 | -- |
| No crowds/solitude | 26.5 | 7.0 | 16.9 | 20.8 | 12.5 |
| Dislike/fear of water | -- | -- | 5.1 | -- | -- |
| Other | 26.4 | 33.4 | 22.1 | 41.6 | 28.2 |
| | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Percentages are rounded.

Fifty-eight percent of the boat fishermen preferred public ramps; 14 percent preferred private ramps. Twenty-three percent of the boat fishermen did not have a preference or did not respond to the question (Table 6.15).

Table 6.15 Boat Fishermen's Preferences for Public or Private Launching Ramps.

| Launching Site Preference | 1981 (N=594) %* | 1982 (N=311) % | 1981&82 (N=905) % |
|---|---|---|---|
| Private site, fees | 16.5 | 10.0 | 14.3 |
| Public site, no fees | 57.9 | 59.8 | 58.6 |
| Other | 1.9 | 6.4 | 3.4 |
| Don't know/no response | 23.7 | 23.8 | 23.7 |
| | 100.0 | 100.0 | 100.0 |

*Percentages are rounded.

In choosing launching sites, boat fishermen were concerned about launching near the fish. The two most important factors in the choice of ramp were the cost (24.4 percent) and its state of maintenance (11.9 percent). Other factors included convenience of location, facilities, easy access to water, and safety and security of people, vehicles and trailers. Twelve percent of those interviewed had no response to the question (Tables 6.16 and 6.17).

Table 6.16 Boat Fishermen's Reasons for Preferring Public or Private Launching Ramps.

| Reasons for Choice of Launching Site | 1981 (N=594) %* | 1982 (N=311) % | 1981&82 (N=905) % |
|---|---|---|---|
| Free/less expensive | 25.1 | 23.2 | 24.4 |
| Well maintained | 11.6 | 12.5 | 11.9 |
| Convenient location | 5.1 | 4.2 | 4.8 |
| Better facilities | 4.4 | 4.8 | 4.5 |
| No waiting | 1.0 | 0.3 | 0.8 |
| Only ramp available | 3.0 | 1.3 | 2.4 |
| Safe/secure | 3.9 | 2.3 | 3.3 |
| No preference | 14.3 | 11.9 | 13.5 |
| Crowds/socialability | 0.5 | 0.3 | 0.4 |
| No crowds/solitude | 2.0 | 2.3 | 2.1 |
| Easy access | 5.1 | 1.9 | 4.0 |
| Tax supported | 1.7 | -- | 1.2 |
| Open to anyone | 1.9 | -- | 1.2 |
| Other | 9.6 | 17.0 | 12.2 |
| Don't know/no response | 11.0 | 16.1 | 12.7 |
| | 100.0 | 100.0 | 100.0 |

*Percentages are rounded.

Table 6.17 Boat Fishermen's Reasons for Preferring Public or Private Ramps by Choice of ramp.

| Reasons for Choice of Launching Site | Private Ramp Preferred (N=123) %** | Public Ramp Preferred (N=505) % | Other (N=29)* % |
|---|---|---|---|
| Free/less expensive | 6.5 | 42.2 | 3.4 |
| Well maintained | 9.8 | 18.4 | 6.9 |
| Convenient location | 5.7 | 3.4 | 31.0 |
| Better facilities | 12.2 | 5.1 | -- |
| No waiting | 4.1 | 0.4 | -- |
| Only ramp available | 5.7 | 2.6 | 3.4 |
| Safe/secure | 21.1 | 0.8 | -- |
| No preference | -- | 0.6 | 20.7 |
| Crowds/sociability | -- | 0.6 | -- |
| No crowds/solitude | 13.8 | 0.2 | -- |
| Easy access | 8.1 | 5.1 | -- |
| Tax supported | -- | 3.2 | -- |
| Open to anyone | -- | 2.2 | -- |
| Other | 13.0 | 15.3 | 34.5 |
| | 100.0 | 100.0 | 100.0 |

*Includes fishermen who kept their boats at a dock at their house, etc.

**Percentages are rounded.

Choice of location is tied to expense, convenience and access to fish. Along the North Carolina sounds, where a shift in wind can change fishing prospects, fishermen are mobile and choose their sites according to fishing

conditions. Where there is a choice between private or public facilities, fishermen prefer the latter. Public fishing sites are free and usually well maintained.

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# APPENDIX A

| | | |
|---|---|---|
| St Base | Open | Check |

DO NOT WRITE IN ABOVE SPACE

Interviewer Name

# NORTH CAROLINA RECREATIONAL FISHERIES QUESTIONNAIRE

*Institute For*
*Coastal and Marine Resources*
EAST CAROLINA UNIVERSITY
GREENVILLE, NORTH CAROLINA

USER SURVEY BY OBSERVATION

CARD NUMBER . . . . . 01 (1-2)

INTERVIEW NUMBER_____ . . . . . 04 (3-8)

SITE TYPE . . . . . (9)

Date (mo/day/yr) _____ . . . . . (11-16)

Site Number_____ . . . . . (17-19)

County_____ State_____ . . . . . (20-24)

Time_____ . . . . . (25-28)

Sky Conditions (29)

1. Clear, less than 10% cloud cover.
2. Scattered clouds, 10% to less than 50% cloud cover.
3. Broken, 50% to 90% cloud cover.
4. Overcast, 100% cloud cover.

Code in the appropriate digit.

Precipitation (30)

1. No rain preceding 12 hours
2. Showers and thunderstorms, sometime during preceding 12 hours, intermittent
3. Constant drizzle, sometime during preceding 12 hours.
4. Steady rain, sometime during preceding 12 hours.

Code in the appropriate digit.

Predominant Wind Speed (31)

1. Calm (less than 1 kt.) . . . . . .
2. Force 1 (light air; 1-3 kts.) . . . . . .
3. Force 2 (light breeze; 4-7 kts.) . . . . . .
4. Force 3 (gentle breeze; 8-12 kts.) . . . . . .
5. Force 4 (moderate breeze; 13-18 kts.) . . . . . .
6. Force 5 (fresh breeze; 19-24 kts.) . . . . . .
7. Force 6 (strong breeze; 25-31 kts.) . . . . . .
8. Greater than Force 6 (gale; 32 kts. plus) . . . .

Predominant Wind Direction (32)

1. N . . . . . .
2. NE . . . . . .
3. E . . . . . .
4. SE . . . . . .
5. S . . . . . .
6. SW . . . . . .
7. W . . . . . .
8. NW . . . . . .
9. Variable . . . . . .

Racial Composition of Party . . . . . 33
White = 1
Black = 2
Other = (see code book)

Number and age of males in party during the fishing trip:

Children (0-15 yrs.) (*write in number seen; 8 = 8 or more children; 9 = DK/NR; 0 = none in party) _____ 34

Young adults (16-29 yrs.) (*write in number seen just as for children) _____ . . . . . 35

Middle-aged adults (30-49 yrs.) (*write in number seen just as for children) _____ . . . . . 36

Older adults (50 plus) (*write in number seen just as for children) _____ . . . . . 37

Number and age of females in the fishing party

Children (0-15 yrs.) (*write in number seen; 8 = 8 or more children; 9 = DK/NR; 0 = none in party) . . . . 38

Young adults (16-29 yrs.) (*write in number seen just as for children) _____ . . . . . 39

Middle-aged adults (30-49 yrs.) (*write in number seen just as for children) _____ . . . . . 40

Older adults (*write in number seen just as for children) _____ . . . . . 41

Boat Used
(0 = No; 1 = Yes) _____ . . . . . 42

Length of Boat _____ . . . . . 43 44

Hull Material _____ . . . . . 45

Type of Motor _____ . . . . . 46

HP of Motor _____ . . . . . 47 49

Number in Party _____ . . . . . 50 51

Estimated Age of Respondent . . . . . 52 53

Sex of Respondent . . . . . 54

Hello, my name is _____. Could you spare about 20 minutes or so when you have your boat secure to help me with a survey?

I am a student at East Carolina University in Greenville. We are conducting a survey of recreational fishermen in the upper Sounds of North Carolina. The study is being sponsored by the North Carolina Sea Grant Program. The purpose of the study is to find out who goes sportfishing, where they come from and the costs and benefits of sportfishing to them and to local communities. Any information that you choose to give us will be strictly confidential and anonymous. As I mentioned, it should take about 15 to 20 minutes, and it would be helpful to us if you could spare the time. (If working with another interviewer . . .) (name of co-worker) . . . is working with me and would like to identify and count the fish you caught today.

Response: Agree = 1; Not agree = 2; DK/NR = 9 55

1. Were you fishing for any particular species today?_____ 56 58 59

_____ 60 61

2. What is the state and county where you live?_____State 62 63

_____County 64 66

3. What is the driving distance in miles from your home to here? 67 69

_____

4. (*If boat used . . .*)Is this your own boat? (see code) . . . . 70

5. How many days will you fish on this trip? . . . . . 71 72

_____

6. Did (will) you stay overnight in this county as a result of this fishing trip? ( 0 = No; 1 = Yes; 3 = Resident; 9 = DK/NR) 73

   (a) (*If respondent indicates no, but is not from this area, probe for overnight stay in a second county*)

   Second County_____ 74 76

   (b) (*If yes to 6 or 6a . . .*) How many days will you spend in this area on this trip?_____ . . . 77 78

7. Could you please estimate the expenses you will incur on this trip and tell me the county you made them in? (*for entire party*)

| Type of Expense | Expenses Site County | Expenses 2nd County | Name of 2nd County | Expenses 3rd County | Name of 3rd County |
|---|---|---|---|---|---|
| A. Gas & oil for boat | | | | | |
| B. Gas & oil for car | | | | | |
| C. Lodging Motel/camping (specify type) | | | | | |
| D. Bait/tackle | | | | | |
| E. Restaurant meals | | | | | |
| F. Groceries (includ. ice) | | | | | |
| G. Beer, alcoholic bev. or other | | | | | |
| H. Launching, storage, or marina fees | | | | | |
| I. Repairs to boat, motor, gear | | | | | |
| J. Boat charter, rental or party boat fee | | | | | |
| K. Other | | | | | |

CARD NUMBER . . . . . 02 (1-2)

INTERVIEW NUMBER _____ . . . . . (3-6)

04 (7-8)

8. Could you tell me, please, the number of years you have . . . sport fished? _____ (11-12)

9. *(For Striped Bass Fishermen)*
How many years have you fished for striped bass? . . . . . _____ (13-14)

10. Could you estimate the number of times last year you . . . . went fishing? *(If striped bass fisherman, ask how many times he/she went striped bass fishing last year)* _____ (15-17)

11. Who is fishing with you today?
(0 = No; 1 = Yes; 9 = NR/DK) . . . . . (18-24)

Parents _____

Children _____

Siblings _____

[redacted] _____

FRIENDS/FROM WORK
FRIENDS/SAME OCCUPATION
FRIENDS/OTHER

[redacted] _____

[redacted] _____

Others _____

Listing of Relatives _____

_____

_____

Fa: Father
Mo: Mother
Br: Brother
Si: Sister
So: Son
Da: Daughter
Hu: Husband
Wi: Wife

12. Do you own any (other) boats(s)? . . . . . □ 25

0 = No
1 = Yes
9 = NR/DK

*(If no to 12, do not ask 13 and 14)*

13. Is this boat used for recreational fishing? . . . . . □ 26
*(Does not refer to boat in use)*

0 = No
1 = Yes
9 = NR/DK

14. Description of fishing boats:
*(If no to 13, do not ask). (Does not refer to boat in use)*

Boat 1: Length _____ □ 27 □ 28

Type of Motor _____ □ 29

HP of Motor _____ □ 30 □ 31 □ 32

Boat 2: Length _____ □ 33 □ 34

Type of Motor _____ □ 35

HP of Motor _____ □ 36 □ 37 □ 38

Other Boats: _____

*(All boat fishermen and bank fishermen answering yes to 12)*

15. How old is your boat(s)?

Boat in Use: _____ . . . . . □ 39 □ 40

Boat 1, above _____ . . . . . □ 41 □ 42

16. How much did you spend on new gear for your boat last year?
*(Only for boat in use)* _____ . . . . . □ 43 □ 44 □ 45 □ 46

17. How much did you spend on launching, storing or mooring your boat last year? *(Only for boat in use)* _____ . . . . □ 47 □ 48 □ 49 □ 50

18. How much did your boat cost to maintain last year? _____ .
*(Only for boat in use)* □ 51 □ 52 □ 53 □ 54

19. How much did you spend on new or replacement fishing tackle for hook and line fishing last year? (55-58) . . . . . 55 58

How much did you spend on new or replacement nets for fishing last year? (including gill nets, seines, trawls) (59-62) . . . 59 62

How much did you spend on any other fishing tackle last year? (Rakes, tongs, flounder gigs and lights, etc.) (63-65). . . . . 63 65

20. How much did you spend last year on other fishing gear? (ice chests, tackle boxes, etc.) (66-68) . . . . . 66 68

21. How many fish has your party caught today and kept? (*If none, code as 0*)

No. of striped bass_____. . . . . 69 70

Other species_____. . . . . 71 72

22. How many fish has your party caught and released alive today? (*If none, code as 0*)

No. of striped bass_____. . . . . 73 74

Other species_____. . . . . 75 76

23. How many fish has your party caught today and used for bait? . 77 78
(*Specify type*)
_____

---

CARD NUMBER . . . . . 1 0 3 2

INTERVIEW NUMBER_____. . . . . 3 6

_____ 7 0 4 8

24. (*If striped bass caught . . .*) What percentage of the striped bass which you have caught and kept will be:

____eaten by your household? . . . . . 11 13

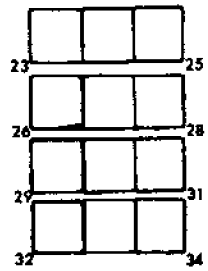
____given away to friends or relatives? . . . . . 14 16

____sold? . . . . . 17 19

____disposed of in another fashion? . . . . . 20 22

(*Specify:*_____)

25. (*If other species caught . . .*) What percentage of the (*other*) fish which you have caught and kept will be:




____eaten by your household? . . . . . .

____given away to friends or relatives? . . . . . .

____sold? . . . . . .

____disposed of in another fashion? . . . . . .

(*Specify:*_____)

26. (*If striped bass will be sold . . .*) If you plan to sell all or part of your striped bass catch, would you indicate whether the buyer will be: (0=No; 1=Yes; 9=NR/DK)

-Local restaurant within this county . . . . 35

-Local wholesaler within this county . . . . 36

-Local retailer or fish market within this county . . . . . 37

-Restaurant outside this county . . . . . 38

-Wholesaler outside this county . . . . . 39

-Retailer or fish market outside this county. 40

-Other (*specify*)_____ 41

27. (*If other species will be sold .*) If you plan to sell all or part of the (other) fish you have caught today, would you indicate whether the buyer will be: (0=No; 1=Yes; 9=NR/DK)

-Local restaurant within this county . . . . 42

-Local wholesaler within this county . . . . 43

-Local retailer or fish market within this. . county 44

-Restaurant outside this county . . . . . 45

-Wholesaler outside this county . . . . . 46

-Retail or fish market outside this county . 47

-Other (*specify*_____) 48

28. Did you enjoy your trip today? .
1) Yes, very much . . . . . 49
2) Yes . . . . . .
3) Satisfactory . . . . . .
4) No . . . . . .
5) Not at all . . . . . .
6) Other (*Specify)_____ . . . . . .
7) DK/NR

29. (*Probe for reasons for answer to 28 ) "What made the trip...?" 50 51
(*Quote answer from 28 )

(*Specify)_____

30. What do you enjoy most about fishing? (Write in:) 52 53

_____

_____

_____

_____

31. What do you most dislike about fishing? (Write in:) 54 55

_____

_____

_____

_____

32. Could you estimate what the cost was, last year, for your average (striped bass) fishing trip?_____(AC) . . . . 56 58
(If not striped bass fisherman, ask for average fishing trip)
If your Average Cost (AC) were to increase to

(a) (4 x AC =) $_____ would you still fish? . . . . . 59
(0 = No; 1 = Yes; 9 = NR/DK)

(b) If they answer no to 21(a), drop cost to 2 x AC and ask if he or she would still fish. If no, lower to 1.5 x AC. Proceed until they would commence fishing, then increase AC until you identify exact cost value which would terminate fishing._____ . . . . . .

(c) If they answer yes to 21(a), raise cost to 6 x AC and ask if he or she would still fish. Continue to raise until fishing is ceased, then drop cost again to identify the precise cost value which would terminate fishing._____ . . . . . .


_____

_____

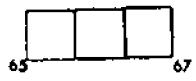
33. If you knew in advance that you would not catch any (target species) today, what would you have done instead?


1. Fished for other species = 1
2. Boating = 2
3. Other marine recreational activity = 3
4. Non-marine recreational activity = 4
5. Work = 5
6. Stayed Home = 6
7. Other = 7

   (Specify)_____
8. NR/DK = 9

Approximately how much would you have spent on this alternate activity within the coastal counties of this state? (Ask *only if 1 through 4 chosen above*)

_____ . . . . . .




34. What is your occupation (job)? What do you do for a living? .

(Specify)_____

_____

CARD NUMBER . . . . . 0 4 (1–2)

INTERVIEW NUMBER _____ . . . . . (3–6)

_____ 0 4 (7–8)

35. What types of fishing gear did you use today? (Check as appropriate)

0 = No
1 = Yes
9 = NR/DK

____Hook and Line . . . . . (11)

____Gill Net . . . . . (12)

____Seine . . . . . (13)

____Cast Net (Bait) . . . . . (14)

____Cast Net--Other . . . . . (15)
Specify: _____

____Rake, Tong . . . . . (16)

____Gig . . . . . (17)

____Other . . . . . (18)
Specify: _____

36. (For hook and line) How did you fish today? (Check as appropriate)

0 = No
1 = Yes
9 = NR/DK

____Trolling . . . . . (19)

____Still Fishing . . . . . (20)

____Drifting . . . . . (21)

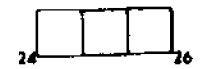
____Casting . . . . . (22)

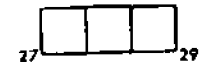
____Other (specify) _____ (23)

Comments: _____

_____

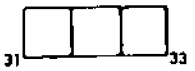
37. Could you show me, please, on this chart the general area you fished in today?

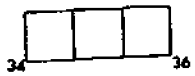
First area_____ 

Second area_____ 

38. Did you use artificial or natural bait today? . . . . . 

1 = artificial
2 = natural
3 = both
4 = neither
9 = NR/DK

39. Can you estimate how much time you spent actually fishing . . (*wet gear time*)?_____ 

40. And, how much running time would you estimate you had?_____ 

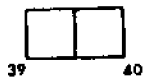
41. Do you have a freshwater fishing license (North Carolina License)? 

0 = No
1 = Yes
9 = NR/DK
3 = Out-of-State Freshwater License

42. (*For Boat Fishermen*)

"Do you prefer to use public or private launching ramps?" 

Private preferred . . . . . 1
Public preferred . . . . . 2
Other (*Specify*) . . . . . 3
DK/NR . . . . . 9

43. "Why do you prefer to use (*insert answer to 42*)?" 

(*Specify*)_____

44. (*For Non-boat Fishermen*)
Do you have a preference for private piers or bridges? 

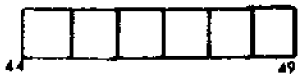
1. Private pier or bridge, fees
2. Public pier or bridge, no fees
3. Bank
4. Beach
5. Other (*specify*)_____
9. NR/DK

45. Why?_____ 

_____

(If alone or isolated with person being interviewed, ask for income in dollars. If others are present or situation warrants it, use only the card according to format:

46. "Please look at this card and tell me which letter corre-. . . sponds to your family income range for last year."

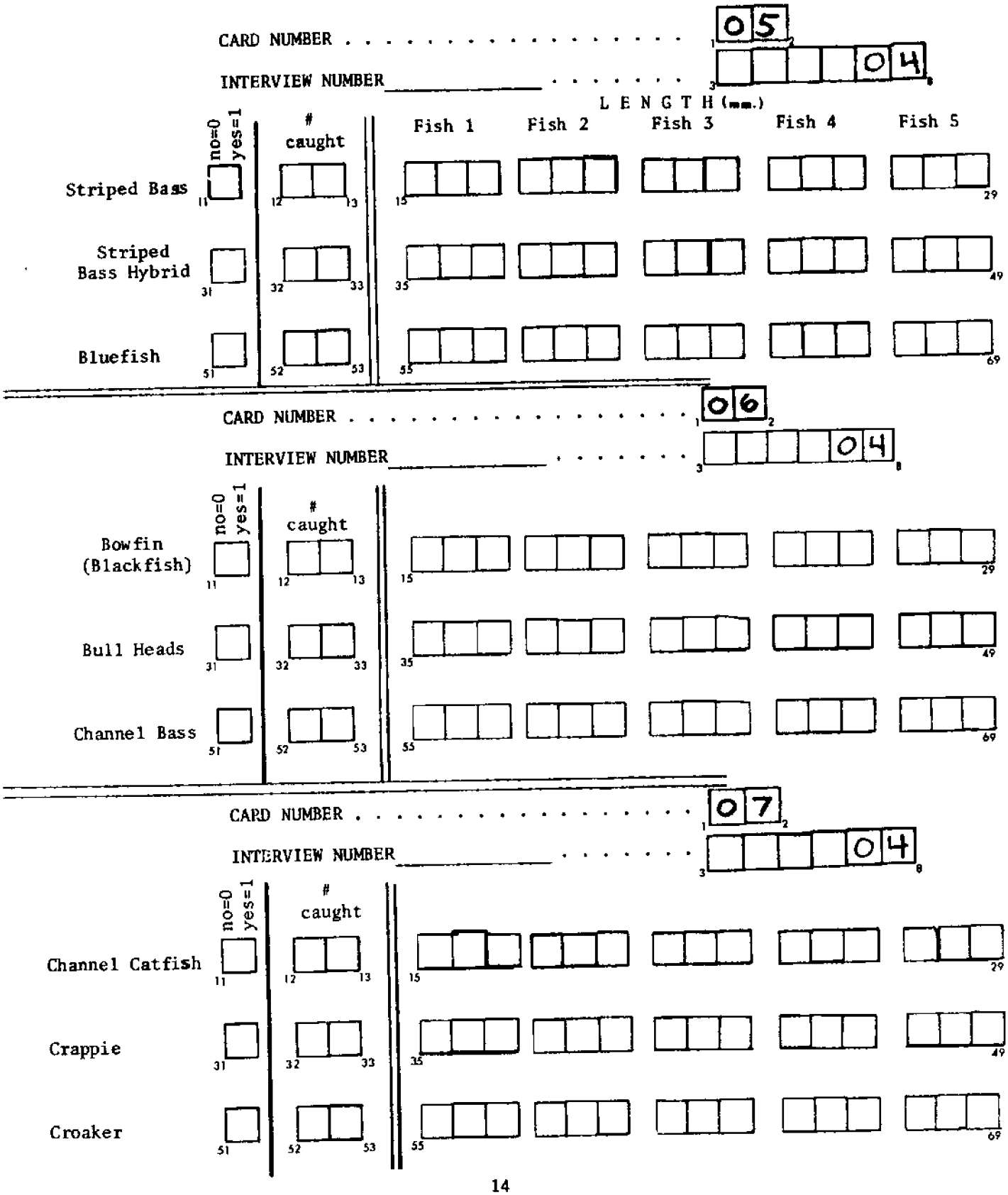



| | |
|---|---|
| A = 00 - 3,999 | 1 |
| B = 4,000 - 4,999 | 2 |
| C = 5,000 - 7,999 | 3 |
| D = 8,000 -11,999 | 4 |
| E =12,000 -14,999 | 5 |
| F =15,000 -15,999 | 6 |
| G =16,000 -19,999 | 7 |
| H =20,000 -24,999 | 8 |
| I =25,000 -29,999 | 9 |
| J =30,000 -34,999 | 10 |
| K =35,000 -44,999 | 11 |
| L =45,000 -49,999 | 12 |
| M =50,000 -54,999 | 13 |
| N = Over 55,000 | 14 |
| DK/NR | 99 |


47. "Could you look at the card again and tell me which letter corresponds to your highest level of schooling?"


| | |
|---|---|
| A = 0 - 3 years | 1 |
| B = 4 - 6 years | 2 |
| C = 7 - 9 years | 3 |
| D = 10 -12 years | 4 |
| E = 2 years college | 5 |
| F = 4 years college | 6 |
| G = Completion of graduate school. | 7 |
| H = Other (Specify _____ ) | 8 |
| DK/NR | 9 |

CREEL SURVEY



CARD NUMBER . . . . . 1 [0][8] 2

INTERVIEW NUMBER _____ . . . . . 3 [ ][ ][ ][ ][0][4] 8

| | no=0 yes=1 | # caught | LENGTH Fish 1 | Fish 2 | Fish 3 | Fish 4 | Fish 5 |
|---|---|---|---|---|---|---|---|
| Flounder | 11 | 12 13 | 15 | | | | 29 |
| Grey Trout | 31 | 32 33 | 35 | | | | 49 |
| Herring | 51 | 52 53 | 55 | | | | 69 |

CARD NUMBER . . . . . 1 [0][9] 2

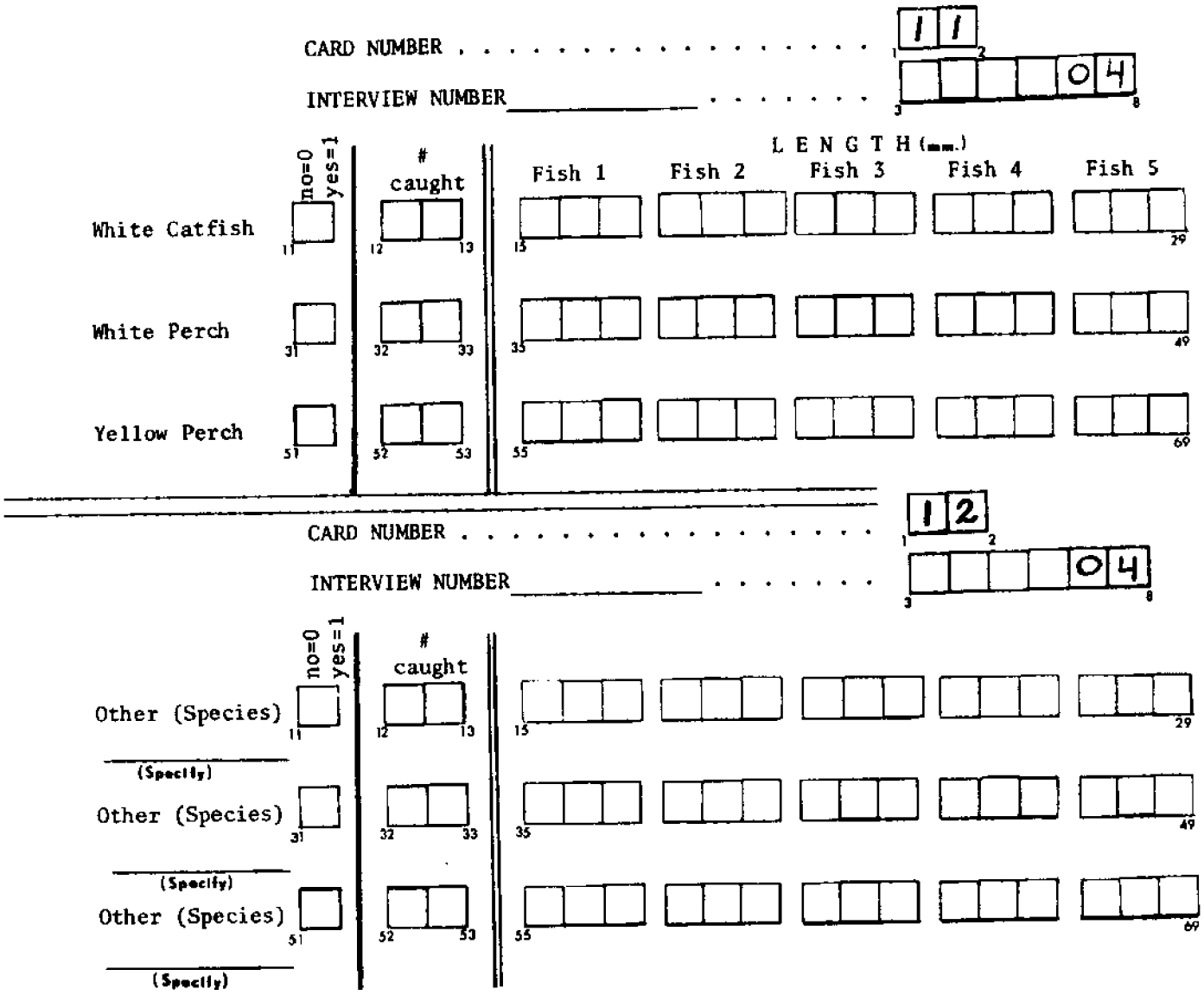
INTERVIEW NUMBER _____ . . . . . 3 [ ][ ][ ][ ][0][4] 8

| | no=0 yes=1 | # caught | | | | | |
|---|---|---|---|---|---|---|---|
| L. M. Bass | 11 | 12 13 | 15 | | | | 29 |
| Pickerel | 31 | 32 33 | 35 | | | | 49 |
| Sea Mullet | 51 | 52 53 | 55 | | | | 69 |

CARD NUMBER . . . . . 1 [1][0] 2

INTERVIEW NUMBER _____ . . . . . 3 [ ][ ][ ][ ][0][4] 8

| | no=0 yes=1 | # caught | | | | | |
|---|---|---|---|---|---|---|---|
| Speckled Trout | 11 | 12 13 | 15 | | | | 29 |
| Spot | 31 | 32 33 | 35 | | | | 49 |
| Sunfishes | 51 | 52 53 | 55 | | | | 69 |


CARD NUMBER . . . . . 1 1
INTERVIEW NUMBER _____ . . . . . 0 4
L E N G T H (mm.)
no=0 yes=1
# caught
Fish 1
Fish 2
Fish 3
Fish 4
Fish 5
White Catfish
White Perch
Yellow Perch
CARD NUMBER . . . . . 1 2
INTERVIEW NUMBER _____ . . . . . 0 4
Other (Species)
(Specify)
Other (Species)
(Specify)
Other (Species)
(Specify)

CARD NUMBER . . . . . 1 3 (1–2)

INTERVIEW NUMBER _____ . . . . . (3–6)

0 4 (7–8)

| Type of Expense | Expenses Site County | Expenses in Second County | Name of Second County | Expenses in Third County | Name of Third County |
|---|---|---|---|---|---|
| A. Gas & oil for boat | (11) | (14) | (17) | (20) | (23–25) |
| B. Gas & oil for car | (27) | (30) | (33) | (36) | (39–41) |
| C. Lodging | (43) | (46) | (49) | (52) | (55–57) |
| D. Bait/tackle | (59) | (62) | (65) | (68) | (71–73) |

CARD NUMBER . . . . . 1 4 (1–2)

INTERVIEW NUMBER _____ . . . . . (3–6)

0 4 (7–8)

| | | | | | |
|---|---|---|---|---|---|
| E. Restaurant meals | (11) | (14) | (17) | (20) | (23–25) |
| F. Groceries (incl. ice) | (27) | (30) | (33) | (36) | (39–41) |
| G. Beer, alcoholic beverages or other | (43) | (46) | (49) | (52) | (55–57) |
| H. Launching, storage, or marina fees | (59) | (62) | (65) | (68) | (71–73) |

CARD NUMBER . . . . . 1 5 (1–2)

INTERVIEW NUMBER _____ . . . . . (3–6)

0 4 (7–8)

| Type of Expense | Expenses Site County | Expenses in Second County | Name of Second County | Expenses in Third County | Name of Third County |
|---|---|---|---|---|---|
| I. Repairs to boat, motor, gear | (11) | (14) | (17) | (20) | (23–25) |
| J. Boat charter, rental or party boat fee | (27) | (30) | (33) | (36) | (39–41) |
| K. Other | (43) | (46) | (49) | (52) | (55–57) |

CARD NUMBER . . . . . 0 5

INTERVIEW NUMBER _____ . . . . . 0 4

| Species Caught | Species Code | No. Caught | LENGTH (mm) Fish 1 | Fish 2 | Fish 3 | Fish 4 | Fish 5 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

0 6

0 4

| Species Caught | Species Code | No. Caught | LENGTH (mm) Fish 1 | Fish 2 | Fish 3 | Fish 4 | Fish 5 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

0 7

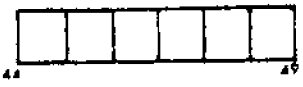
0 4

| Species Caught | Species Code | No. Caught | LENGTH (mm) Fish 1 | Fish 2 | Fish 3 | Fish 4 | Fish 5 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Changes for second year

(If alone or isolated with person being interviewed, ask for income in dollars. If others are present or situation warrants it, use only the card according to format:

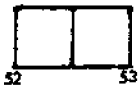
46. "Please look at this card and tell me which letter corresponds to your family income range for last year."




| | |
|---|---|
| A = 0 - 3,999 | 1 |
| B = 4,000 - 7,999 | 2 |
| C = 8,000 - 11,999 | 3 |
| D = 12,000 - 15,999 | 4 |
| E = 16,000 - 19,999 | 5 |
| F = 20,000 - 23,999 | 6 |
| G = 24,000 - 27,999 | 7 |
| H = 28,000 - 31,999 | 8 |
| I = 32,000 - 35,999 | 9 |
| J = 36,000 - 39,999 | 10 |
| K = 40,000 - 43,999 | 11 |
| L = 44,000 - 47,999 | 12 |
| M = 48,000 - 51,999 | 13 |
| N = Over 52,000 | 14 |
| DK/NR | 99 |


47. "Could you look at the card again and tell me which letter corresponds to your highest level of schooling?"

| | |
|---|---|
| A = 0 - 3 years | 1 |
| B = 4 - 6 years | 2 |
| C = 7 - 9 years | 3 |
| D = 10 - 12 years | 4 |
| E = 2 years college | 5 |
| F = 4 years college | 6 |
| G = Completion of graduate school | 7 |
| H = Other (Specify_____) | 8 |
| DK/NR | 9 |




48. "How old are you?" _____

1. How many times do you think you will go fishing this year? (*include those trips already fished*) _____

2. Of this year's fishing trips in North Carolina, approximately how many are in waters not requiring a state freshwater fishing license, not including ocean fishing? (*boat trips only*) _____

3. Of these fishing trips (*referring to response in Number 2*), how many are from this location (*ramp, marina, site*)? (*if all from this location, do not ask Question 4*) _____

4. Why do you fish from different locations? _____

_____

_____

_____

_____

# APPENDIX B

| CARD # | QUES # | COL # | VAR NAME | QUESTION | CODE |
|---|---|---|---|---|---|
| 1 | | 17-19 | SNO | SITE NUMBER | |
| | | | | SANDY POINT (WA) . | 305 |
| | | | | MACKEY'S (WA) . | 308 |
| | | | | SAWYER'S MARINA (WA) . | 310 |
| | | | | COLUMBIA WLR (WA) . | 311 |
| | | | | 1104 RAMP (EA) . | 402 |
| | | | | ELIZABETH CITY (EA) . | 403 |
| | | | | FLOYD OWENS (EA) . | 404 |
| | | | | EAST LAKE (EA) . | 407 |
| | | | | MASHOES (EA) . | 408 |
| | | | | LITTLE BRIDGE (CR) . | 501 |
| | | | | MANNS HARBOR (CR) . | 502 |
| | | | | OREGON INLET (CR) . | 504 |
| | | | | WHITE'S GROC (CR) . | 506 |
| | | | | STUMPY POINT WLR (P). . | 601 |
| | | | | TEACH'S LAIR (P). . | 605 |
| | | | | WILLIS LANDING (P). . | 607 |
| | | | | VILLAGE MARINA (P). . | 608 |
| | | | | JACK'S STORE (P). . | 609 |
| | | | | DRIFTWOOD (P). . | 612 |
| | | | | CEDAR ISLAND RAMP (P). . | 613 |
| | | | | HOBUCKEN MARINA (P). . | 614 |
| | | | | FISHERMAN'S WHARF (P). . | 615 |
| | | | | OYSTER CREEK (P). . | 616 |
| | | | | WHITE PLAINS (P). . | 618 |
| | | | | SALVO EXXON (P). . | 619 |
| | | | | WHICHARD'S BEACH (T). . | 701 |
| | | | | MUNICIPAL RAMP (T). . | 702 |
| | | | | GRIMESLAND (T). . | 703 |
| | | | | JALYNN (T). . | 704 |
| | | | | PORT TERMINAL (T). . | 705 |
| | | | | 264 BY-PASS (T). . | 706 |
| | | | | TOWN COMMON (T). . | 707 |
| | | | | MEMORIAL (T). . | 708 |
| | | | | FALKLAND (T). . | 709 |
| | | | | PENNY HILL (T). . | 710 |
| | | | | OLD SPARTA (T). . | 711 |
| | | | | ISLE VUE MARINA (T). . | 712 |
| | | | | H & W GROCERY (T). . | 713 |
| | | | | BELHAVEN (T). . | 716 |
| | | | | MOORE ENTERPRISES (T). . | 717 |
| | | | | LEECHVILLE (T). . | 718 |
| | | | | HILL'S GROCERY (N). . | 801 |
| | | | | JANIERO WLR (N). . | 802 |
| | | | | UNION POINT (N). . | 803 |
| | | | | ORIENTAL WLR (N). . | 804 |
| | | | | PARADISE SHORE (N). . | 805 |

*(R) - ROANOKE, (WA) - WESTERN ALBEMARLE, (EA) - EASTERN ALBEMARLE, (CR) - CROATAN, (P) - PAMLICO, (T) - TAR AND PAMLICO RIVER, (N) - NEUSE