

CIRCULATING COPY
Sea Grant Depository

TAMU-SG-91-807
R/F-28
NA83AA-D-00061

LOAN COPY ONLY

DEMOGRAPHICS, PARTICIPATION, ATTITUDES,
EXPENDITURES, AND MANAGEMENT PREFERENCES
OF TEXAS SALTWATER ANGLERS, 1986

by

Robert B. Ditton, David K. Loomis,
Alan D. Risenhoover, Seungdam Choi,
Maury F. Osborn, Jerry Clark, Robin Riechers
and Gary C. Matlock



MANAGEMENT DATA SERIES
No. 18
1990

**Texas Parks and Wildlife Department
Fisheries Division
4200 Smith School Road
Austin, Texas 78744**

DEMOGRAPHICS, PARTICIPATION, ATTITUDES,
EXPENDITURES, AND MANAGEMENT PREFERENCES
OF TEXAS SALTWATER ANGLERS, 1986

by

Robert B. Ditton, David K. Loomis,
Alan D. Risenhoover, Seungdam Choi,
Maury F. Osborn, Jerry Clark, Robin Riechers
and Gary C. Matlock

MANAGEMENT DATA SERIES
No. 18
1990

Texas Parks and Wildlife Department
Fisheries Division
Coastal Fisheries Branch
4200 Smith School Road
Austin, Texas 78744

ACKNOWLEDGMENTS

Partial funding support for this study was provided by the Texas Parks and Wildlife Department, the Texas A&M University Sea Grant College Program and the Texas Agricultural Experiment Station. We acknowledge the work of several individuals who were involved in this survey research project: Jerri Evander supervised the survey procedure and was assisted by Kelly Faulkner. Tim Bradle assisted with completion of the final report.

ABSTRACT

Anglers who purchased a Texas saltwater fishing stamp during its first year of issuance between January 1 and July 31, 1986 were sent a mail survey inquiring about their general demographics, attitudes toward management tools, fishing motivations, species preferences and annual expenditures. Two-thirds of Texas saltwater anglers responding were residents of Texas coastal counties. Nearly 45% have been fishing in saltwater for over 20 years. Most (44%) fished in saltwater 13 or fewer days the previous year. About 15% of anglers reported fishing outside of Texas. Anglers were supportive of stocking fish in saltwater and minimum size limits as management tools and were most opposed to "slot limits" and the prohibition of certain types of bait. "For relaxation," "To be outdoors," and "To get away from the regular routine" were ranked as the most important reasons for fishing; "Obtaining a trophy fish" and winning a trophy were ranked as least important. Anglers agreed with the phrases "I usually eat the fish I catch" and "I like to fish where there are several kinds of fish to catch" and disagreed most with "I want to keep all the fish I catch" and "I usually give away the fish I catch." Spotted seatrout (Cynoscion nebulosus), red drum (Sciaenops ocellatus), and flounder (Paralichthys lethostigma or P. albiquitta) were the most sought fishes by Texas saltwater anglers. Most saltwater fishing items bought by respondents were purchased in Texas and used predominantly for saltwater fishing. On average, Texas anglers spent approximately \$1,500/year in Texas for saltwater fishing gear and equipment.

INTRODUCTION

During the early development of fisheries management, scientific efforts were generally limited to the collection and analysis of biological data. Management activities progressed from regulation of gear as a means to reduce user conflict (with or without scientific basis) to the goal of maximum sustainable yield (MSY) to ensure adequate reproduction and recruitment and to maximize yield in terms of weight (Gulland 1977). Little consideration, however, has been given to the human dimensions of fisheries management (Voiland and Duttweiler 1984).

This has been the case despite a consensus of thought since the 1960's that successful management depends as much on solving "people problems" as on solving biological problems (Bryan 1976). Leading resource scholars have argued that natural resources are managed by managing people (O'Riordan 1971, Clawson 1972); similarly, the necessity of understanding the human component has been stated within the fisheries community (Ditton 1977, Orbach 1980, Aron 1982).

Christy and Scott (1965) suggested that maximum net economic yield should replace MSY as the objective for fisheries management. The Fishery Conservation and Management Act of 1976 specified a goal of optimum yield (OY), defined as the yield that would produce the greatest overall benefit to the nation with respect to food production and recreational opportunity. This was to be based on MSY as modified by relevant economic, social and ecological factors. Fisheries management thus needs to consider not only biological and ecological factors, but economic and social factors as well. This is especially true with respect to recreational fisheries, for if management for "the greatest benefit to society" is to succeed, managers must be concerned with user satisfaction and public attitudes toward regulatory policies. This is vital since any policy, no matter how scientifically sound, will be rejected and fail if it is not in accord with fundamental views held by the public (Vanderpool 1986, Matlock et al. 1988).

The Texas Parks and Wildlife Department (TPWD) has conducted routine on-site interviews of saltwater sport-boat anglers (creel surveys) since 1974 (Osburn et al. 1988). These creel surveys have been used to estimate annual sport landings and pressure, and to monitor species and size composition of the landings. Except for 1 year (Texas Department of Water Resources 1979), these surveys were not used to collect social and economic data on a routine basis until 1987. Several studies of the social and economic aspects of the sport fishery existed, but were primarily concerned with identifiable sub-groups of fishermen (Graefe and Ditton 1976; Ditton et al. 1977, 1980; Ditton and Holland 1984; Ditton and Loomis 1985; Ditton and Arneson-Bewley 1986; Fedler and Ditton 1986; Ditton and Loomis 1988), and not the full population of Texas saltwater recreational anglers.

In response to the need for social and economic information, TPWD and the Department of Recreation and Parks at Texas A&M University (TAMU) conducted during 1986 the first in a series of mail surveys of licensed saltwater anglers. This survey, and those to follow, were designed to obtain annual social and economic information on saltwater anglers and their activity. This information will be used for improved fisheries management through 1) moni-

toring and prediction of public response to regulations and other management tools, 2) allocation and prediction of economic impacts due to management action, 3) design of management programs to maximize angler satisfaction, 4) education of anglers and 5) prediction of demand for different resources over time.

The objective of this report is to summarize the data from the first mail survey. This summary includes a demographic profile of Texas recreational saltwater anglers, their attitudes towards management tools, fishing motivations, species preferences, level of satisfaction and annual expenditures. The report also presents data relevant to evaluating the survey instrument, sample sizes and the use of the saltwater sport fishing stamp as a sampling frame, for use in improving future surveys.

MATERIALS AND METHODS

Approximately 218,000 people purchased a saltwater sport fishing stamp during its first year of issuance between January 1 and July 31, 1986. Using these sales receipts as the sampling frame, a random sample of 6,371 stamp purchasers was manually selected (Sheskin 1985). The saltwater sport fishing stamp cost \$5.00 and was required (in addition to a valid fishing license) of all persons who fished in salt and coastal waters for non-commercial purposes. In 1986, this included those anglers < 17 and > 65 who were also required to hold a fishing license which was issued free of charge. Purchasers' names and addresses were listed on sheets (up to 18 names per sheet) that license vendors sent to TPWD. Using a randomly selected starting point, the last name listed on every 34th sheet was included in the sample. Only legible names and addresses were included in the sample. Records not legible were replaced with the preceding name on the list. A computerized list of the selected stamp purchasers was prepared.

A mail questionnaire was developed to collect information on angler demographics, previous experience, fishing participation, level of investment, attitudes and motivations and orientation to fisheries management efforts. Questions were based on previous research efforts and designed to provide managers with useful information.

First, a social and economic profile of Texas saltwater anglers was sought with questions regarding age, gender, income, residence location and length of residence. Saltwater angler responses regarding age were categorized into six age groups with 10-year categories. Anglers were asked for their approximate annual household incomes using standard \$10,000 categories to \$99,999. These categories were developed to be broad enough to not invade personal privacy yet managerially useful. Saltwater anglers were categorized first according to their three-digit U.S. Postal Service zip code, secondly, whether or not they resided in Texas and, if so, whether or not they resided in one of the 18 counties with coastal waters within their boundaries. Finally, saltwater anglers were asked how long they had lived continuously in Texas; these responses were grouped using 10-year categories to 59.

Two questions were used to collect information on the level of fishing experience among saltwater anglers. First, anglers were asked how many years they had fished in saltwater; their responses were grouped using 10-year categories. Second, anglers were asked to compare their fishing ability to

that of other anglers in general using three nominal categories (less skilled, equally skilled and more skilled).

A series of questions sought information on saltwater angler participation in sport fishing. First, anglers were asked to report the number of days they fished in the previous 12 months in three major categories (freshwater, saltwater bays and saltwater gulf). Second, saltwater anglers were asked to indicate the three kinds of fish they preferred to catch in saltwater in Texas (first choice, second choice and third choice). Third, saltwater anglers were asked to choose among five alternate responses regarding with whom they fished most often (by yourself, friends, family, family and friends together and club). Fourth, saltwater anglers were asked if they participated in saltwater tournaments and, if so, the number they fished per year. Finally, saltwater anglers were asked if they had fished outside of the state and, if so, to identify their destination for each trip taken, the number of days spent there, species sought and total trip expenditures.

Saltwater anglers were asked about their investment in equipment used for sport fishing. First, saltwater anglers were asked if they or someone in their household owned a powerboat and, if so, the length of the longest boat owned. Second, saltwater anglers were asked if they had purchased one or more pieces of indicated outdoor equipment during the previous 12 months; and if an expenditure was made, the purchase price of each item, whether it was purchased in Texas and the percent of time used for saltwater fishing.

Orientation towards catching fish was investigated with a scale developed by Graefe (1977, 1980) to understand four sub-dimensions of consumption: number of fish caught, type of fish caught, disposition of catch and general orientation toward catching "something". Anglers were asked to indicate the extent to which they agreed with each attitudinal statement on a Likert-type scale. Also, 16 motive statements for saltwater fishing were rated by each respondent. Anglers were asked to indicate the importance of each statement as a reason for fishing using a Likert-type scale. Ten motive statements dealt with the generic benefits sought in most outdoor recreation activities (activity-general). The statements were single-item measures of the following Driver (1977) domains: physical rest, escape physical pressures, escape daily routine, relationships with nature, escape role overloads, family togetherness, social contacts, exploration, achievement-competence testing and equipment. In addition, six motive statements dealt with experience elements associated only with sport fishing (activity-specific): "To obtain fish for eating", "For the experience of the catch", "To obtain a trophy fish", "To be close to the sea", "For the challenge or sport" and "To obtain a trophy". Driver (1977) and Driver and Cooksey (1978) documented the reliability and validity of the activity-general scales.

Three questions were included in the questionnaire to explore the degree of support for agency management efforts. First, using a Likert-type scale, saltwater anglers were asked whether or not they supported each of 10 management tools used by TPWD for managing saltwater fisheries. Second, anglers were asked to what extent they used nine sources of saltwater fishing information using a Likert-type scale. The information sources investigated ranged from interpersonal contact to formal media outlets including information provided by TPWD. Third, in an effort to understand angler commitment to

resource conservation, they were asked if they caught a tagged fish whether or not they would report the tag to the appropriate authorities.

Finally, two open-ended questions were used to give saltwater anglers an opportunity to tell us what was important to them. First, saltwater anglers were asked to describe their most memorable saltwater fishing trip. Their responses were content analyzed and up to five trip characteristics listed per angler. Content assignments were either activity-specific or activity-general. Finally, saltwater anglers were asked if there was "anything else they would like to share with us?" Responses (up to 5 per respondent) of saltwater anglers were content analyzed and grouped according to whether they were positive or negative.

A preliminary questionnaire was pre-tested with 310 Texas saltwater stamp purchasers between June 24 and July 31, 1986. Response rate after one mailing and a follow-up postcard was approximately 48%.

Data were requested from each selected stamp purchaser using a 12 page, 21 question mail questionnaire (Appendix A) between September 16 and November 4, 1986. This time period was selected to reduce recall bias since the majority of saltwater fishing takes place in the spring and summer (Ditton and Graefe 1978). With survey procedures based partly on Dillman (1978) and partly on experience gained through previous data collections (Ditton and Gramann 1987, Ditton and Loomis 1988), the survey was personalized as much as possible to enhance response rate. For example, letters were personally addressed to each angler using "mailmerge" techniques and personally signed with the names of those responsible for the survey. Finally, addresses were typed directly on the envelopes. When nondeliverables are excluded from consideration, a final response rate of 71.2% was obtained (Figure 1).

Questionnaires were checked for completeness of response; 1.5% of the questionnaires returned were not usable since respondents reported they had not fished in the previous 12 months. Location of residence, species preference and open-ended questions were coded by project personnel. Next, data were entered into a computer file and error checked. Frequency distributions for all variables were generated as a final check against error.

RESULTS

Demographics

In 1986, the Texas saltwater angling community was dominated by 20-49 year-old middle-class males from coastal urban areas (Table 1, Figure B.1-B.2). Female anglers comprised about 20% of the Texas saltwater anglers. Two-thirds of all saltwater anglers resided in coastal counties (Table 2). Five percent of the respondents were from out-of-state and an additional 4% indicated that although they currently reside in Texas, they were not permanent Texas residents (Table 3). The majority (59%) of Texas saltwater anglers were from urban areas on the coast, primarily from Houston (23%), Corpus Christi (13%) and the Beaumont area (7%), while 17% were from two major inland population centers, Dallas-Fort Worth (4%) and San Antonio (13%) (Table 4). Twelve percent of Texas saltwater anglers had lived in Texas less than 10 years although almost 75% had lived in Texas for over 20 years (Table 5,

Figure B.3). About 63% of the respondents had household incomes between \$20,000 and \$59,999 (Table 6).

Participation and Experience

Texas saltwater anglers indicated a strong commitment to saltwater fishing in terms of number of days fished and number of years they had participated in the sport. Texas saltwater anglers fished an average of 24.4 days in saltwater and an average of 10.1 days in freshwater (Table 7). Twenty-five percent of the respondents fished over 33 days in saltwater in the previous year. Seventy-eight percent of the respondents fished from a boat and 80% from shore in saltwater bays at least once; almost 47% of the respondents fished from boats in the Gulf of Mexico and 60% fished from shore in the gulf. Fifty-four percent of respondents' households owned a power boat in 1986 (Table 8); most were 16 to 26 feet in length (Table 8, Figure B.4). Most respondents (71%) had fished in saltwater for 10 or more years (Table 9, Figure B.5); about 63% felt they were equally skilled when compared to other anglers (Table 10).

Respondents generally did not participate competitively in saltwater fishing. More than 90% of saltwater anglers fished most often with family and/or friends (Table 11). Only 10% of Texas saltwater anglers fished in saltwater tournaments (Table 12); the majority of those who did participate fished in only 1 (47%) or 2 (32%) events during 1986. Respondents indicated that they relied on a variety of sources for information on fishing (Table 13). Word of mouth through other anglers and bait and tackle shops were reportedly used most often (lots of use or a great deal of use) followed by written media (newspaper articles, TPWD materials and magazine articles). Least used were fishing clubs.

The majority of saltwater anglers indicated a preference for catching red drum (Scianops ocellatus) and spotted seatrout (Cynoscion nebulosus) (Table 14). Flounder (Paralichthys sp.) was the third preferred species. All other species ranked below 5% in preference.

About 15% of the anglers took out-of-state fishing trips in the previous 12 months (Table 15). The most popular destinations in terms of anglers and trips were Louisiana, Florida, Mexico, Colorado, and Oklahoma. Those five destinations accounted for more than 63% of traveling anglers and 50% of the number of out-of-state trips. Bass and t-rout were targeted most by saltwater anglers on out-of-state fishing trips. Except for salmon (Salmonidae), the species targeted during out-of-state trips were all available in Texas (Table 16).

Motivations and Attitudes

Although Texas saltwater anglers generally rated activity-specific items as less important than activity-general items as motivations for fishing, responses to questions regarding their consumptive attitudes indicated that catching and keeping fish is important to their fishing experience. Eight motivational items including "for relaxation," "to be outdoor," "to get away from the regular routine," "for the experience of the catch," "to experience natural surroundings," "for the challenge or sport," "to get away from the demands of other people" and "for family relaxation" were rated very to

extremely important by the majority of the respondents (Table 17). Only two of these items are specific to fishing. More than 1/2 of the respondents rated "to obtain a trophy fish" and "to win a trophy" as not at all important. Over 85% of the respondents indicated that they eat the fish they catch (Table 18). Most saltwater anglers also agreed with statements such as "I like to fish where there are several kinds of fish to catch", that "a fishing trip can be successful even if no fish are caught", "the more fish I catch, the happier I am" and "I would rather catch one or two big fish than ten smaller fish". Responses to other fish-related items were more neutral or indicated disagreement. The majority disagreed with statements that "I want to keep all the fish I catch" and "I usually give away the fish I catch".

Attitudes toward management tools used by TPWD were most positive for stocking and minimum size limits and most negative for prohibition of certain types of bait and slot limits (Table 19). Most saltwater anglers supported stocking, minimum size limits, bag limits, prohibition of certain sportfishing gears, restricted areas, closed seasons and maximum size limits. More than 50% of the respondents were neutral or opposed to slot limits, prohibition of types of bait and not being able to retain certain species in certain areas. Almost 99% of the saltwater anglers reported that they would report catching tagged fish (Table 20).

Expenditures

Saltwater anglers spent approximately \$1,500 per angler on fishing tackle, camping equipment, boats, and vehicles in the previous 12 months. Expenditures on boating equipment accounted for 76%, vehicles accounted for 15%, fishing tackle accounted for 7%, and camping equipment and other equipment made up 2% of the total average annual expenditures (Table 21). Over 90% of the items in each category were purchased in Texas and many of the purchases (fishing equipment and boating equipment items) were used primarily for saltwater fishing. Rods, reels, and lures were purchased more often than any of the other equipment. (Table 21, Appendix C). The average cost per item ranged from \$1.53 for a lure color selector to a \$2,850 for vehicle expenditures. Total annual average expenditures per angler were \$1,492.

Angler Feedback

Saltwater angler responses to the open-ended question on their most memorable saltwater fishing trip indicated overwhelmingly that some aspect of the catch was most important (Table 22), although the size and number of fish caught were apparently less related to a memorable trip. Over 45% of all responses to this question described a catch-related or specific species trip aspect. All other categories were mentioned on less than 10% of the responses. When asked if there was anything else they would like to share, anglers were positive towards the stocking of fish, catch and release and current regulations, and negative toward commercial fishing and the saltwater sport fishing stamp requirement (Table 23). The saltwater fishing stamp was listed most often, followed by comments related to commercial fishing and current regulations.

Survey instrument evaluation

A majority of survey questions had less than 150 non-respondents/item (Table 24). In addition to the two open-ended questions, four questions had a particularly high rate of non-response: 1) number of days fished in saltwater gulf from a boat, 2) number of days fished in saltwater gulf from shore or piers, 3) number of days of fishing outside the state of Texas (where fishing was the primary motivation for the trip) and 4) the number of years anglers have lived continuously in Texas.

DISCUSSION

Study results are not directly applicable to licensed anglers who fished saltwater and for whatever reason did not purchase a saltwater fishing stamp. Previous estimates of over 1 million saltwater anglers in Texas (National Marine Fisheries Service 1980, U.S. Fish and Wildlife Service 1989, Green et al. 1982) contrast with the sampling frame (N = 218,000) from which our sample was drawn. Possible explanations for this include: 1) the purchase of the saltwater stamp was first required starting January 1986, 4 months after the 1985-86 license year had begun, 2) initial resistance to a new license and an additional \$5.00 fee, 3) anglers might not have known the new stamp was required and 4) anglers may have taken a chance on lenient enforcement until the license year ended. As predicted by adoption-diffusion theory (Rogers and Shoemaker 1971), it may take some time for the saltwater stamp to be "adopted" by licensed saltwater anglers.

Until the saltwater stamp is sufficiently accepted, statewide surveys using the stamp for sampling are likely to over represent more committed anglers as evidenced by their avidity levels, boat ownership and tournament participation rates. As a group, the statewide sample exhibited a higher level of avidity in 1986 (24 saltwater days/angler/year) than the general population of Texas saltwater anglers in 1985 (12 days/angler/year) (U.S. Fish and Wildlife Service 1989). The extremely high number of days fished/angler/year is also probably due to the high level of nonresponse to sections of question 2 asking where participants fished; i.e. a category was left blank although the respondent intended a zero but did not take the time to fill in the line. In terms of avidity the statewide sample of saltwater anglers was more like the group of saltwater boat anglers studied previously by Graefe (1980). When sample results for tournament participation were extrapolated to the population, about 21,800 anglers participated in >1 saltwater tournament/year. This appears higher than the 15,500 anglers who reportedly participated in saltwater tournaments in Texas in 1983 (Christian and Trimm 1986). Also, the rate of boat ownership (54%) for the statewide sample exceeded that of the general angler population (48%) in Texas in 1985 (U.S. Fish and Wildlife Service 1989).

More resident saltwater anglers in Texas (15%) reported an out-of-state fishing trip (freshwater or saltwater) in the previous 12 months than reported for state residents in 1985 (7%) (U.S. Fish and Wildlife Service 1989). The exportation of angling activity constitutes a sizable loss of related expenditures and economic impact. As Texas is promoted as a tourism destination, both nonresident and resident saltwater anglers need to be better informed of fishing opportunities in the state.

While a higher percentage of Texas residents appear to be taking out-of-state fishing trips, the vast majority of fishing related expenditures for equipment occurs within the state. The statewide average annual expenditure of \$1500 per saltwater fisherman is considerably higher than the \$567 average expenditure reported for the general population of Texas saltwater anglers surveyed by the U.S. Fish and Wildlife Service (USFWS) (1989). Only three out of the eight categories surveyed by the USFWS, i.e. fishing equipment, auxiliary equipment and special equipment categories, were included in this study; thus a lower average expenditure could have been expected in the statewide survey. Avidity levels of survey respondents or larger sample size (especially for expensive items) may explain the differences between the USFWS and this survey.

The survey resulted in a high level of response; procedural changes in how the survey was conducted should be avoided in future efforts to maintain this level of response. According to Dillman (1978) efforts to de-personalize mail surveys (i.e., elimination of personal salutation or handwritten signatures and the use of mailing labels) would be expected to reduce the rate of response achieved. The response rate of 71% was consistent with the average response rate of 74% reported by Dillman (1978) for 48 previous studies that used his "total design method." No check for non-response bias was made because previous checks have generally shown that survey results have over-represented anglers with an interest in the subject matter, greater ability and more overall fishing experience (Ditton and Holland 1984).

LITERATURE CITED

- Aron, W. 1982. Fishery science, uncertainty and responsibility. *Fisheries* 7(1):6-8.
- Bryan, H. 1976. The sociology of fishing: a review and critique. Pages 83-92. In: H. Clepper, editor. *Marine Recreational Fisheries*. Sport Fishing Institute, Washington, District of Columbia.
- Christy, F. and A. D. Scott. 1965. *The commonwealth of ocean fisheries*. John Hopkins Press, Baltimore.
- Christian, R. T. and D. L. Trimm. 1986. An inventory of Texas saltwater fishing tournaments: spatial, temporal and participation patterns in 1983. Management Data Series. Number 97. Texas Parks and Wildlife Department, Coastal Fisheries Branch. Austin.
- Clawson, M. 1972. Emerging American life style. Pages 59-60. In: M. Hormachea, editor, *Recreation in modern society*. Holbrook Press, Inc., Boston.
- Dillman, D. A. 1978. *Mail and telephone surveys*. John Wiley and Sons, New York.
- Ditton, R. B. 1977. Human perspectives in optimum sustainable yield fisheries management. Pages 29-41. In: H. Clepper, editor, *Marine Recreational Fisheries 2*. Sport Fishing Institute. Washington, District of Columbia.
- Ditton, R. B. and L. A. Arneson-Bewley. 1986. 1984 Deep Sea Round-up fishing tournament: an analysis of participants' characteristics, attitudes, and expenditures. TAMU-SG-86-203. Texas A&M University Sea Grant College Program, College Station.
- Ditton, R. B. and A. R. Graefe. 1978. Recreational fishing use of artificial reefs on the Texas coast. Contract No. (77-79) 0805. Texas Coastal and Marine Council, Austin.
- Ditton, R. B., A. R. Graefe, and G. Lapotka. 1980. Economic aspects of recreational boat fishing in the Houston-Galveston area of the Texas coast. TAMU-SG-80-206. Texas A&M University Sea Grant College Program, College Station, Texas.
- Ditton, R. B. and J. H. Gramann. 1987. A survey of down-island visitors and their use patterns at Padre Island National Seashore. USDI-NPS-7029-5-0005. Cooperative Park Studies Unit, Department of Recreation and Parks, Texas A&M University, College Station.
- Ditton, R. B. and S. M. Holland. 1984. Understanding involved fishermen: a survey of members of the Gulf Coast Conservation Association. TAMU-SG-84-623. Texas A&M University Sea Grant College Program, College Station.

- Ditton, R. B. and D. K. Loomis. 1985. 1983 Texas International Fishing Tournament: an analysis of participants' characteristics, attitudes, and expenditures. TAMU-SG-85-202. Texas A&M University Sea Grant College Program, College Station.
- Ditton, R. B. and D. K. Loomis. 1988. 1985 Southeast Texas Sportfishing Tournament: an analysis of participant's characteristics, attitudes, and expenditures. TAMU-SG-88-201. Texas A&M University Sea Grant College Program, College Station.
- Ditton, R. B., Mertens, T. J. and M. P. Schwartz. 1977. Characteristics, participation and motivations of Texas charter boat fishermen. *Marine Fisheries Review* 40(8):8-13.
- Driver, B. L. 1977. Item pool for scales designed to quantify the psychological outcomes desired and expected from recreation participation. Unpublished report. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Ft. Collins, Colorado.
- Driver, B. L. and R. W. Cooksey. 1978. Psychological outcomes that are desired and expected from recreational fishing and their relevance to sport fisheries management. Unpublished report. USDA Forest Science, Rocky Mountain Forest and Range Experiment Station, Ft. Collins, Colorado.
- Fedler, A. J. and R. B. Ditton. 1986. A framework for understanding the consumptive orientation of recreational fishermen. *Environmental Management* 10(2):221-227.
- Graefe, A. R. 1977. Development of an attitude scale to measure fishermen's desire to catch fish. Unpublished paper. Available from author at Department of Recreation and Parks, Pennsylvania State University, University Park.
- Graefe, A. R. 1980. The relationship between level of participation and selected aspects of specialization in recreational fishing. Ph.D. Thesis, Texas A&M University, College Station.
- Graefe, A. R. and R. B. Ditton. 1976. Recreational shark fishing on the Texas gulf coast; an exploratory study of behavior and attitudes. *Marine Fisheries Review* 38(2):10-20.
- Green, A. W., L. Z. Barrington and G. C. Matlock. 1982. An estimation of the total number of Texas fishermen, 1 September 1978-August 1979. *Proceedings of the Annual Conference. Southeastern Association of Fish and Wildlife Agencies* 36:241-251.
- Gulland, J. A. 1977. *The management of marine fisheries.* University of Washington Press, Seattle.
- Matlock, G. C., Saul, G. E. and C. E. Bryan. 1988. Importance of fish consumption to sport fishermen. *Fisheries* 13(1):25-26.

- National Marine Fisheries Service. 1980. Marine recreational fishery statistics survey, Atlantic and Gulf coasts, 1979. U.S. National Marine Fisheries Service, Current Fishery Statistics 8063.
- Orbach, M. K. 1980. The human dimension. Pages 149-163. in: R. Lackey and L. Nielsen, editors. Fisheries management. John Wiley & Sons, New York.
- O'Riordan, T. 1971. Perspectives on resource management. Pion Ltd., London.
- Osburn, H. R., M. F. Osborn and H. R. Maddux. 1988. Trends in finfish landings by sport-boat fishermen in Texas Marine Waters, May 1974-May 1987. Management Data Series. Number 150. Texas Parks and Wildlife Department, Coastal Fisheries Branch. Austin.
- Rogers, E. M. and F. F. Shoemaker. 1971. Communication of innovation: a cross-cultural approach. The Free Press, New York.
- Sheskin, I. M. 1985. Survey research for geographers. Association of American Geographers, Washington, District of Columbia.
- Texas Department of Water Resources. 1979. The influence of freshwater inflows upon the major bays and estuaries of the Texas Gulf coast executive summary. Austin.
- U.S. Fish and Wildlife Service. 1989. 1985 National survey of fishing, hunting, and wildlife-associated recreation: Texas. U.S. Department of the Interior, U.S. Department of Commerce, Bureau of the Census, Washington, District of Columbia.
- Vanderpool, J. K. 1986. Social assessment of fisheries resources: policy and institutional framework in the Great Lakes. Presented at the 117th American Fisheries Society Annual Meeting. Providence, Rhode Island.
- Voiland, M. P. and M. W. Duttweiler. 1984. Where's the humanity? A challenge and opportunity for the fisheries community. Fisheries 9(4):10-12.

Table 1. Number and percent of saltwater anglers by gender and age category.

Age category (years)	Male		Female		Total	
	no.	%	no.	%	no.	%
<20	86	2.5	13	1.6	99	2.4
20 - 29	681	20.2	193	23.8	874	20.9
30 - 39	1096	32.5	233	28.7	1329	31.8
40 - 49	686	20.3	146	18.0	832	19.9
50 - 59	505	15.0	154	19.0	659	15.8
>60	319	9.5	72	8.9	391	9.3
Total	3373	100.0	811	100.0	4184	100.1

Table 2. Distribution of responses to: What is the zip code of your current home residence?

Response	no.	%
Coastal counties ^a	2760	66.6
Non-coastal counties	1188	28.7
Outside of Texas	194	4.7
Total	4142	100.0

^aIncludes the 18 counties adjacent to the coast.

Table 3. Distribution of responses to: Are you currently living in Texas, even if you are not a resident of Texas?

Response	no.	%
Texas	3777	91.3
Other	360	8.7
Total	4137	100.0

Table 4. Number and percent of saltwater anglers by their three-digit postal Zip Code.

Zip Code/Post Office	no.	%
796 Abilene	11	0.3
786 Austin	79	1.9
787 Austin	102	2.5
789 Austin	23	0.6
776 Beaumont	188	4.5
777 Beaumont	107	2.6
778 Bryan	32	0.8
773 Conroe	119	2.9
783 Corpus Christi	231	5.6
784 Corpus Christi	305	7.4
750 Dallas	45	1.1
751 Dallas	22	0.5
752 Dallas	36	0.9
760 Fort Worth	46	1.1
761 Fort Worth	24	0.6
770 Houston	681	16.4
774 Houston	283	6.8
794 Lubbock	10	0.2
759 Lufkin	15	0.4
785 McAllen	224	5.4
769 Midland	10	0.2
97 Midland	17	0.4
775 Pasadena	518	12.5
780 San Antonio	59	1.4
781 San Antonio	119	2.9
782 San Antonio	354	8.5
788 San Antonio	11	0.3
765 Temple	29	0.7
757 Tyler	13	0.3
779 Victoria	151	3.6
766 Waco	11	0.3
767 Waco	11	0.3
Other ^a	256	6.2
Total	4142	100.0

^aOther category includes Zip Codes with less than 10 respondents.

Table 5. Number and percent of saltwater anglers by length of residence in Texas.

Number of years	no.	%
<10	449	12.2
10 - 19	477	13.0
20 - 29	842	22.9
30 - 39	924	25.2
40 - 49	498	13.6
50 - 59	310	8.4
>60	172	4.7
Total	3672	100.0

Table 6. Number and percent of saltwater anglers by household income category.

Income category (Dollars)	no.	%
<10,000	284	7.1
10,000 - 19,999	585	14.7
20,000 - 29,999	786	19.7
30,000 - 39,999	800	20.0
40,000 - 49,999	563	14.1
50,000 - 59,999	366	9.2
60,000 - 69,999	231	5.8
70,000 - 79,999	120	3.0
80,000 - 89,999	56	1.4
90,000 - 99,999	36	0.9
≥100,000	165	4.1
Total	3992	100.0

Table 7. Number and percent of saltwater anglers by reported number of days spent fishing in freshwater and saltwater bays and gulf by boat, shore, or pier reported during previous 12 months.

Days/ Year ^a	0	1-13	14-33	34-63	>64	Total	Mean	Standard Error
<u>Freshwater</u>								
no.	865	1822	629	188	94	3598 ^b	10.1	0.4
%	24.0	50.6	17.5	5.2	2.6	99.9		
<u>Saltwater Bays</u>								
<u>from boat</u>								
no.	790	1875	600	190	74	3529	9.3	0.4
%	22.4	53.1	17.0	5.4	2.1	100.0		
<u>shore/pier</u>								
no.	684	1943	527	144	80	3378	8.5	0.3
%	20.2	57.5	15.6	4.3	2.4	100.0		
<u>Saltwater Bays Total</u>								
no.	169	1490	826	335	166	2986	20.5	0.6
%	5.7	49.9	27.7	11.2	5.6	100.1		
<u>Saltwater Gulf</u>								
<u>from boat</u>								
no.	1609	1257	102	16	12	2996	2.0	0.2
%	53.7	42.0	3.4	0.5	0.4	100.0		
<u>shore/pier</u>								
no.	1250	1461	272	64	40	3087	4.6	0.3
%	40.5	47.3	8.8	2.1	1.3	100.0		
<u>Saltwater Gulf Total</u>								
no.	845	1413	324	77	40	2699	7.9	0.4
%	31.3	52.4	12.0	2.9	1.5	100.0		
<u>Saltwater Total</u>								
no.	58	1096	787	414	246	2601	24.4	0.8
%	2.2	42.1	30.3	15.9	9.5	100.0		
<u>Grand Total</u>								
no.	26	694	846	563	440	2569	34.5	1.0
%	1.0	27.0	32.9	21.9	17.1	99.9		

^aCategories of fishing frequency >0 are based on Graefe (1980).

^bSince missing values were treated as missing data, means across categories are not additive to the grand mean.

Table 8. Distribution of saltwater anglers by response to: Do you or someone in your household own a power boat?

Response	no.	%
Yes	2274	54.4
No	1905	45.6
Total	4179	100.0

If yes, what length is the longest one?

Length (ft)	no.	%
<16	559	24.6
16 - 26	1663	73.1
27 - 40	44	1.9
>41	8	0.4
Total	2274	100.0

Table 9. Number and percent of saltwater anglers by the number of years they have been fishing in saltwater.

Number of years	no.	%
0	25	0.6
1 - 9	1174	28.7
10 - 19	1065	26.0
20 - 29	939	22.9
30 - 39	581	14.2
40 - 49	217	5.3
50 - 59	86	2.1
>60	7	0.2
Total	4094	100.0

Table 10. Number and percent of saltwater anglers by perceived fishing ability compared to other anglers.

Ability category	no.	%
Less skilled	1018	24.3
Equally skilled	2625	62.8
More skilled	539	12.9
Total	4182	100.0

Table 11. Number and percent of saltwater anglers by type of group they fished with most often: ranked by frequency.

Group	no.	%
Family & friends together	1454	34.9
Friends	1203	28.8
Family	1182	28.3
By yourself	327	7.8
Club	6	0.1
TOTAL	4172	99.9

Table 12. Distribution of responses to: Do you participate in saltwater fishing tournaments.

Response	no.	%
Yes	437	10.4
No	3724	89.6
Total	4169	100.0

If yes, how many tournaments did you participate in since this time last year?

Number of tournaments	no.	%
0	2	0.5
1	203	46.5
2	139	31.8
3	56	12.8
4	14	3.2
≥5	23	5.3
Total	437	100.1

Table 13. Percent of saltwater anglers by the extent they used different types of saltwater fishing information.

Type of information	Value ^a					no. ^b
	1	2	3	4	5	
Comments and opinions of other anglers	6.5	7.2	44.8	29.2	12.3	4138
Texas Parks and Wildlife magazine	28.6	16.5	34.6	14.4	5.8	4114
Other information provided by Texas Parks and Wildlife Department (brochures. etc)	22.2	19.4	36.5	14.8	7.1	4121
Newspaper articles	13.9	18.2	40.1	20.9	6.8	4145
Magazine articles	20.1	21.2	38.5	15.1	5.0	4133
Bait and tackle shops	13.3	16.7	37.7	23.2	9.0	4141
Fishing clubs	67.7	17.1	10.6	3.3	1.3	4101
Radio shows	45.1	21.1	23.8	6.7	3.3	4122
Television shows	29.5	19.9	31.5	12.8	6.3	4142

^a1 = no use; 2 = little use; 3 = some use; 4 = lots of use; 5 = a great deal of use.

^bThe no listed for each item reflects the number that responded to each item.

Table 14. Number and percent of saltwater anglers by saltwater species most preferred: ranked by first choice percentages.

Species	1st Choice		2nd Choice		3rd Choice	
	no.	%	no.	%	no.	%
Spotted seatrout ^b	1520	37.7	1340	33.8	548	15.1
Red drum	1472	36.5	1414	35.7	525	14.4
Flounder	446	11.1	570	14.4	1357	37.3
King mackerel	160	4.0	90	2.3	148	4.1
Red snapper	108	2.7	85	2.1	136	3.7
Drum (unspecified)	72	1.8	99	2.5	256	7.0
Shark (unspecified)	45	1.1	56	1.4	112	3.1
Catfish (unspecified)	34	0.8	47	1.2	81	2.2
Others ^c	174	4.3	263	6.6	478	13.1
Total	4031 ^a	100.0	3964	100.0	3641	100.0

^a 84 anglers did not give a first choice, 251 anglers did not give a second choice and 574 anglers did not give a third choice.

^b Anglers identified species preferences with common names.

^c Other species included Amberjack, anything, Barracuda, Billfish, Black drum, Blacktip shark, Blue marlin, Bluefish, Cobia, Croaker, Dolphin, Florida pompano, Gafftopsail catfish, Halibut, King salmon, Marlin, Sailfish, Salmon, Sand bass, Sand trout, Sea bass, Sea trout, Sheepshead, Snapper, Snook, Spanish mackerel, Tarpon and Tuna.

Table 15. Distribution of trips taken out of state during the previous twelve months by destination.

State or Country	no. of trips	%	no. of anglers	Mean Days Fished/Trip ^b	Standard Error
Louisiana	161	18.9	147	7.1	0.9
Florida	86	10.1	80	9.3	0.8
Mexico	71	8.3	65	8.2	2.1
Colorado	58	6.8	56	11.4	1.7
Oklahoma	49	5.7	45	8.8	2.0
Arkansas	39	4.6	39	6.8	0.7
Canada	32	3.7	31	8.1	0.9
New Mexico	27	3.2	24	8.0	1.9
Missouri	24	2.8	20	6.7	1.0
Wyoming	24	2.8	21	6.7	1.6
Alaska	21	2.5	19	6.8	1.1
California	21	2.5	18	10.6	5.7
Mississippi	21	2.5	21	5.1	0.4
Minnesota	16	1.9	15	8.6	1.8
Montana	14	1.6	14	20.5(7.0) ^d	11.3
Other ^c	190	22.2	111	8.9	1.2
Total	854 ^a	100.0	726 ^e	8.5	0.5

^a Total number of out-of-state fishing trips reported by 624 anglers.

^b 41 trips had missing information for days fished. Mean number of days fished/trip was based on 813 trips.

^c States and other jurisdictions with less than 10 fishing trips were aggregated in the other category. There were 38 other states or jurisdictions named.

^d Figure in parenthesis is after disregarding 3 outliers.

^e Total exceeds number of anglers taking out-of-state trips because multiple responses were possible.

Table 16. Distribution of trips taken out of state during the previous twelve months by species sought.

Species ^a	no.	%	no. of anglers	Mean Days Fished/Trip ^b	Standard Error
<u>Freshwater</u>					
Bass	192	24.9	155	7.4	0.8
Trout	181	23.4	145	9.7	1.1
Walleye	29	3.8	25	9.6	1.3
Crappie	20	2.6	16	11.7	2.2
<u>Saltwater</u>					
Spotted seatrout	66	8.5	59	6.6	1.0
Red drum	47	6.1	43	8.0	1.5
Salmon	34	4.4	31	7.5	0.9
Sailfish	21	2.7	20	4.2	0.6
Tarpon	15	1.9	15	6.9	0.8
Catfish	14	1.8	13	13.3	4.7
Snapper	14	1.8	14	9.4	2.9
Flounder	13	1.7	12	9.3	3.4
<u>Fresh and Saltwater</u>					
Other ^c	126	16.3	108	9.6	1.1
Total	772 ^d	100.0	656 ^e	8.5	0.5

^a Anglers reported species sought with common names.

^b 120 trips had missing information for days fished. Mean number of days fished/trip was based on 652 trips.

^c Species with less than 10 fishing trips are aggregated into other category. Other species included Billfish, Bluefish, Bluegill, Bonefish, Bream, Bullhead, Catfish, Dolphin, Flathead, Jewfish, Kingfish, King salmon, Little tunny, Northern pike, Perch, Pike, Shark, Snook, Spanish mackerel and Tuna.

^d Total number of out-of-state fishing trips reported by 624 anglers;

^e Total exceeds number of anglers taking out-of-state trips because multiple responses were possible.

Table 17. Percent of saltwater anglers by the importance they attribute to various reasons why people fish in saltwater.

Reasons why people fish	Value ^a					no. ^b
	1	2	3	4	5	
To be outdoors	2.8	5.5	21.3	41.9	28.4	4127
For family recreation	8.3	13.7	26.8	33.0	18.1	4086
To experience new and different things	14.4	18.1	30.3	24.7	12.5	4059
For relaxation	2.5	4.4	13.5	36.5	43.2	4060
To be close to the sea	17.7	18.0	25.9	20.6	17.8	4033
To obtain fish for eating	12.9	19.6	34.6	18.2	14.6	4142
To get away from the demands of other people	13.8	11.3	19.1	26.7	29.1	4091
For the experience of the catch	5.4	9.0	23.3	32.4	29.9	4069
To test my equipment	41.0	25.8	21.6	7.9	3.8	4053
To be with friends	10.0	12.2	29.9	30.8	17.1	4080
To experience natural surroundings	6.5	9.8	25.9	33.4	24.4	4093
To win a trophy	76.8	11.4	7.5	2.0	2.3	4072
To develop my skills	23.5	19.6	28.9	18.0	10.0	4075
To get away from the regular routine	5.4	6.5	20.2	35.1	32.7	4052
To obtain a "trophy" fish	53.8	16.1	16.3	7.0	6.8	4058
For the challenge or sport	11.3	9.8	25.3	28.2	25.3	4124

^a1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important.

^bThe no. listed for each item reflects the number that responded to each item.

Table 18. Percent of saltwater anglers by the extent they agree or disagree with statements about sport fishing in saltwater.

Statement	Value ^a					no. ^b
	1	2	3	4	5	
The more fish I catch, the happier I am	5.4	13.6	22.6	40.0	18.1	4125
A fishing trip can be successful even if no fish are caught	5.2	12.1	14.1	49.1	19.2	4126
When I go fishing, I'm just as happy as if I don't catch a fish	11.3	36.7	21.1	22.3	8.6	4115
I usually eat the fish I catch	2.4	4.1	7.7	39.3	46.4	3959
A successful fishing trip is one in which many fish are caught	6.6	24.0	26.4	30.7	12.4	4052
I would rather catch one or two big fish than ten smaller fish	4.8	17.7	25.8	31.6	20.2	4125
It doesn't matter to me what type of fish I catch	11.6	34.3	20.5	27.0	6.5	4106
The bigger the fish I catch, the better the fishing trip	5.3	23.0	26.3	31.9	13.5	4080
I'm just as happy if I don't keep the fish I catch	12.5	28.4	22.1	28.2	8.7	4057
I like to fish where there are several kinds of fish to catch	0.7	2.2	13.3	54.6	29.2	4070
I want to keep all the fish I catch	16.2	40.7	22.8	13.2	7.1	4125
I catch fish for sport and pleasure rather than for food	11.2	25.7	27.8	24.7	10.5	4116
I'm just as happy if I release the fish I catch	9.7	27.8	27.2	25.7	9.6	4120
I usually give away the fish I catch	23.0	43.5	23.3	7.5	2.7	4116

^a1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree.

^bThe no. listed for each item reflects the number that responded to each item.

Table 19. Percent of saltwater anglers by support or opposition to management tools used by the Texas Parks and Wildlife Department.

Statement	Value ^a					no. ^b
	1	2	3	4	5	
Releasing fish below a certain length (minimum size limit)	3.1	5.3	8.5	38.1	45.0	4170
Releasing fish above a certain length (maximum size limit)	10.2	17.7	18.0	27.9	26.1	4161
Releasing fish within a certain length range, but keeping the fish below and above this range (slot limit)	9.9	17.4	36.4	22.7	13.6	4081
Being able to keep only a certain number of fish you catch in a day (daily bag limit)	6.1	9.3	10.8	40.9	33.0	4160
Not being able to fish in certain restricted areas	7.4	12.1	23.4	35.8	21.3	4154
Having certain fishing areas closed during part of the year (closed season)	8.7	13.3	24.4	33.7	19.8	4147
Prohibiting the use of certain types of sport fishing gear	6.1	10.5	26.8	32.3	24.4	4144
Prohibiting the use of certain types of bait	10.5	21.4	33.1	21.3	13.7	4139
Not being able to retain certain species in certain areas	7.3	13.3	31.7	30.9	16.9	4126
Stocking fish in saltwater	1.4	2.1	12.5	30.2	53.9	4154

^a1 = strongly oppose; 2 = oppose; 3 = neutral; 4 = support; 5 = strongly support.

^bThe no. listed for each item reflects the number that responded to each item.

Table 20. Number and percent of saltwater anglers as to whether or not they would report catching a tagged fish.

Response	no.	%
Yes	4122	98.7
No	53	1.3
Total	4175	100.0

Table 21. Average expenditures (dollars) per person for Texas saltwater anglers in 1986. SW denotes saltwater.

Description of item(s)	Mean \$ spent per person	% respondents buying at least one	% mean spent for		Avg. \$ spent per person for Texas SW fishing
			SW Fishing	Purchases in Texas	
Tackle					
Rods	49.62	75	75	97	36.23
Reels	39.39	35	72	97	27.53
Lures, tackle boxes, landing nets, etc.	42.37	67	74	98	31.06
Live bait equipment	13.64	38	85	100	11.54
Fish attracting lights	6.73	5	60	100	4.00
Lure color selector	1.53	4	50	92	<u>0.76</u>
Subtotal					111.12
Camping Equipment					
Trailer or camper	191.05	5	12 ^a	93	22.52
Tents, sleeping bags, lanterns, stoves, ice chests, etc.	36.83	36	10 ^b	98	<u>3.67</u>
Subtotal					26.19
Boating					
Electronic equipment; depth finders, fish locators, radio, etc.	37.02	9	71	90	23.32
Boat accessories; anchors, safety equipment, etc.	20.34	20	72	98	14.41
Boats	925.88	22	71	96	625.43
Boat motors	502.81	23	72	99	360.51
Boat trailers	139.61	18	76	99	<u>105.03</u>
Subtotal					1,128.70
Vehicles					
Autos, vans, pickups, RVs, all terrain vehicles	2,850.41	28	8 ^c	95	<u>221.36</u>
Subtotal					221.36
Other equipment	28.88	12	17 ^d	100	<u>4.83</u>
Subtotal					4.83
GRAND TOTAL					1,492.20

a,b,c,d The percentage of mean spent for saltwater fishing for these categories was based on the reported number of days fished in Question 2 of the survey (see Appendix A).

Table 22. Distribution of saltwater angler responses to: Briefly describe your most memorable saltwater fishing trip.

Aspect of trip	no.	%
Catch related	2728	24.4
Specific species	2445	21.8
Social related	1093	9.8
Size of fish	999	8.9
Number of fish	900	8.0
Family	703	6.3
Location specific	543	4.8
Friends	449	4.0
Charter or party boat related	187	1.7
Traveled offshore	159	1.4
Weather related	135	1.2
Catch and release	134	1.2
Challenge related	127	1.1
Relaxing setting	108	1.0
Other	493	4.4
Total	11203 ^a	100.0

^a Each angler could list up to five responses. Comments were made by 1,101 anglers.

Table 23. Distribution of selected saltwater angler responses to: Is there anything else you would like to share with us?

Response	Total		Positive Response		Negative Response	
	no.	%	no.	%	no.	%
Related to stocking fish	86	12.4	83	96.5	3	3.6
Related to commercial fishing	173	25.0	2	1.2	171	98.8
Related to saltwater fishing stamp	270	39.0	43	15.9	227	84.1
Related to catch and release of fish	11	1.6	9	81.8	2	18.2
Related to current regulations	151	21.9	100	66.2	51	33.8
Total	691 ^a	99.9				

^a Each angler could list up to five responses. Comments were made by 570 anglers.

Table 24. Number of non-respondents by angler survey question number.

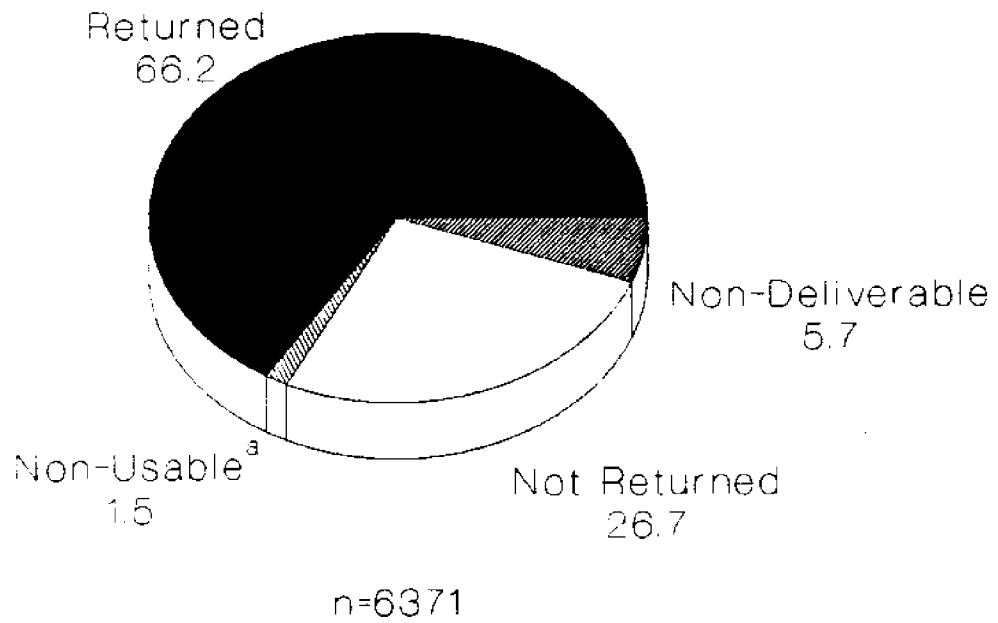
Question no.	no.
1	121
2a	617
b	686
c	837
d	1219
e	1128
3	33
4a	88
b	129
c	156
d	155
e	182
f	73
g	124
h	146
i	162
j	135
k	122
l	143
m	140
n	163
o	157
p	91
5a	184
b	251
c	574
6a	36
7a	90
b	89
c	100
d	256
e	163
f	90
g	109
h	244
i	158
j	145
k	90
l	99
m	95
n	99
8	54
9	43
10	3591
11a	77

Table 24. (Cont.)

Question no.	no.
b	101
c	94
d	70
e	82
f	74
g	114
h	93
i	73
12	40
13	3114
14a	45
b	54
c	134
d	55
e	61
f	68
g	71
h	76
i	89
j	91
15a	78
	543
^a 16a	517
b	675
c	362
d	503
e	447
f	478
a	454
b	401
a	358
b	372
c	424
d	423
e	456
a	540
b	2722
a	1648
b	2927
17	31
18	31
19	223
20	73
open-ended question	3645

^aMissing responses are based on the yes/no portion of the question.

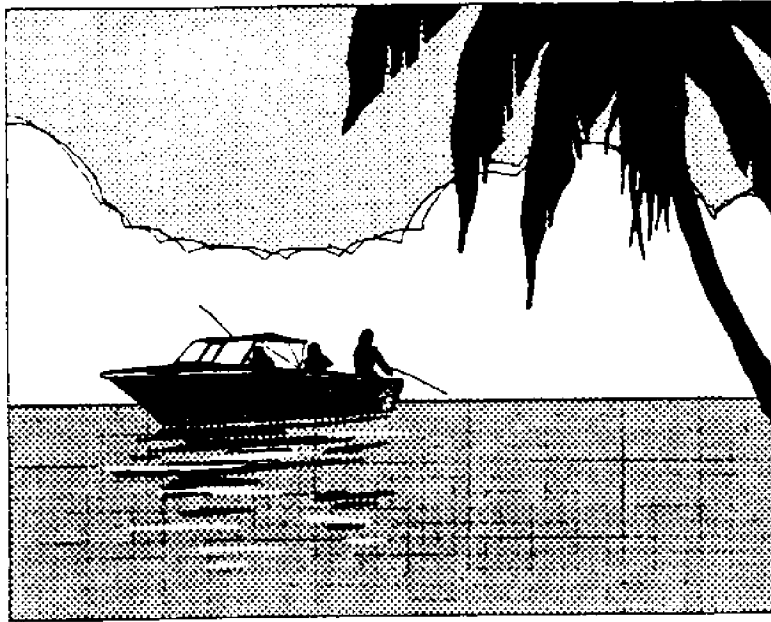
Figure 1. Response rate (percents) for the 1986 Texas statewide survey of saltwater anglers.



^aThe returned non-usable category includes those who indicated they were not saltwater anglers.

Appendix A. 1986 Texas saltwater fishing survey instrument.

**1986
TEXAS SURVEY OF
SALTWATER FISHERMEN**



TEXAS PARKS AND WILDLIFE DEPARTMENT

**TEXAS A&M UNIVERSITY
DEPARTMENT OF RECREATION AND PARKS
COLLEGE STATION, TEXAS 77843**

QUESTIONNAIRE

IN THE FOLLOWING QUESTIONS, PLEASE TELL US ABOUT YOUR FISHING
ACTIVITY AND EXPERIENCE.

1. How many years have you been fishing in saltwater?

_____ YEARS

2. Since this time last year, how many days did you go fishing?

NUMBER OF DAYS FISHED:

(if none, please enter 0)

_____ IN FRESHWATER

_____ IN SALTWATER BAYS FROM A BOAT

_____ IN SALTWATER BAYS FROM SHORE OR PIERS

_____ IN SALTWATER GULF FROM A BOAT

_____ IN SALTWATER GULF FROM SHORE OR PIERS

3. How do you compare your fishing ability to that of other
fishermen in general?

1 LESS SKILLED

2 EQUALLY SKILLED

3 MORE SKILLED

4. BELOW IS A LIST OF REASONS WHY PEOPLE FISH IN SALTWATER. PLEASE CIRCLE THE NUMBER THAT INDICATES HOW IMPORTANT EACH ITEM IS TO YOU AS A REASON FOR FISHING.

		NOT AT ALL IMPORTANT	SLIGHTLY IMPORTANT	MODERATELY IMPORTANT	VERY IMPORTANT	EXTREMELY IMPORTANT
REASONS:						
a)	To be outdoors	1	2	3	4	5
b)	For family recreation	1	2	3	4	5
c)	To experience new and different things	1	2	3	4	5
d)	For relaxation	1	2	3	4	5
e)	To be close to the sea	1	2	3	4	5
f)	To obtain fish for eating	1	2	3	4	5
g)	To get away from the demands of other people	1	2	3	4	5
h)	For the experience of the catch	1	2	3	4	5
i)	To test my equipment	1	2	3	4	5
j)	To be with friends	1	2	3	4	5
k)	To experience natural surroundings	1	2	3	4	5
l)	To win a trophy	1	2	3	4	5
m)	To develop my skills	1	2	3	4	5
n)	To get away from the regular routine	1	2	3	4	5
o)	To obtain a "trophy" fish	1	2	3	4	5
p)	For the challenge or sport	1	2	3	4	5

5. Name the kinds of fish you most prefer to catch in saltwater in Texas.

_____ FIRST CHOICE
 _____ SECOND CHOICE
 _____ THIRD CHOICE

6. Do you or someone in your household own a power boat?

- 1 YES
- 2 NO

If YES, what length is the longest one?

_____ FEET

7. PLEASE INDICATE THE EXTENT TO WHICH YOU AGREE OR DISAGREE WITH EACH OF THE FOLLOWING STATEMENTS ABOUT SPORT FISHING IN SALTWATER.

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a) The more fish I catch, the happier I am	1	2	3	4	5
b) A fishing trip can be successful even if no fish are caught	1	2	3	4	5
c) When I go fishing, I'm just as happy if I don't catch a fish.	1	2	3	4	5
d) I usually eat the fish I catch.	1	2	3	4	5
e) A successful fishing trip is one in which many fish are caught	1	2	3	4	5
f) I would rather catch one or two big fish than ten smaller fish	1	2	3	4	5
g) It doesn't matter to me what type of fish I catch	1	2	3	4	5
h) The bigger the fish I catch, the better the fishing trip.	1	2	3	4	5
i) I'm just as happy if I don't keep the fish I catch.	1	2	3	4	5
j) I like to fish where there are several kinds of fish to catch.	1	2	3	4	5
k) I want to keep all the fish I catch	1	2	3	4	5
l) I catch fish for sport and pleasure rather than for food.	1	2	3	4	5
m) I'm just as happy if I release the fish I catch	1	2	3	4	5
n) I usually give away the fish I catch.	1	2	3	4	5

8. Do you participate in saltwater fishing tournaments?

1 YES

2 NO

If YES, how many tournaments do you participate in each year?

_____ SALTWATER TOURNAMENTS EACH YEAR

9. What type of group do you fish with most often?
(mark only one answer please)

- 1 BY YOURSELF
- 2 FRIENDS
- 3 FAMILY
- 4 FAMILY & FRIENDS TOGETHER
- 5 CLUB

10. Have you gone fishing outside the state of Texas in the previous 12 months (where fishing was the primary motivation for the trip)?

- 1 YES
- 2 NO

If YES, what states did you fish in (other than Texas)?

STATE	DAYS THERE	SPECIES SOUGHT	TOTAL EXPENDITURES
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

11. TO WHAT EXTENT DO YOU MAKE USE OF THE FOLLOWING FOR SALTWATER FISHING INFORMATION?

	NO USE	LITTLE USE	SOME USE	LOTS OF USE	A GREAT DEAL OF USE
a) Comments and opinions of other anglers	1	2	3	4	5
b) Texas Parks and Wildlife Magazine.	1	2	3	4	5
c) Other information provided by Texas Parks and Wildlife Department (brochures, etc.).	1	2	3	4	5
d) Newspaper articles	1	2	3	4	5
e) Magazine articles.	1	2	3	4	5
f) Bait and tackle shops.	1	2	3	4	5
g) Fishing clubs.	1	2	3	4	5
h) Radio shows.	1	2	3	4	5
i) Television shows	1	2	3	4	5

12. If you caught a tagged fish, would you report the tag?

- 1 YES
- 2 NO

13. Briefly describe your most memorable saltwater fishing trip.

14. THE FOLLOWING IS A LIST OF TOOLS USED BY THE TEXAS PARKS AND WILDLIFE DEPARTMENT FOR MANAGING RECREATIONAL SALTWATER FISHERIES.

Please indicate below whether you support or oppose these tools.

	1	2	3	4	5
	STRONGLY OPPOSE	OPPOSE	NEUTRAL	SUPPORT	STRONGLY SUPPORT
a) Releasing fish below a certain length (minimum size limit)	1	2	3	4	5
b) Releasing fish above a certain length (maximum size limit)	1	2	3	4	5
c) Releasing fish within a certain length range, but keeping the fish below and above this range (slot limit)	1	2	3	4	5
d) Being able to keep only a certain number of fish you catch in a day (daily bag limit)	1	2	3	4	5
e) Not being able to fish in certain restricted areas	1	2	3	4	5
f) Having certain fishing areas closed during part of the year (closed season)	1	2	3	4	5
g) Prohibiting the use of certain types of sport fishing gear	1	2	3	4	5
h) Prohibiting the use of certain types of bait	1	2	3	4	5
i) Not being able to retain certain species in certain areas.	1	2	3	4	5
j) Stocking fish in saltwater	1	2	3	4	5

15. Are you currently living in Texas, even if you are not a resident of Texas?

- 1 YES
- 2 NO

If YES, how long have you continuously lived in Texas?

- More than 1 year? 1 YES
- 2 NO

If YES, how many years? _____ YEARS

16. THE FOLLOWING QUESTION PROVIDES VALUABLE INFORMATION FOR ESTIMATING THE IMPORTANCE OF SALTWATER FISHING TO YOU AND TO THE STATE OF TEXAS. PLEASE HELP US BY BEING ESPECIALLY CAREFUL WITH THIS QUESTION.

Please record your expenditures for the following items if purchased since this time last year. Use numbered lines to list individual purchases. To see how to complete percents for the last column, please refer to the following example:

EXAMPLE: Assume you purchased a boat and use it a total of 100 hours per year. Of this 100 hours, 25 hours were for saltwater fishing in Texas. In this case, 25% should be allocated to saltwater fishing.

		Did you purchase any of the following items since this time last year		Purchase price	Was the item, or most of the items purchased in Texas?		Percent of time item was used for saltwater fishing.
		(please circle)			(please circle)		
TACKLE:							
a) Rod(s)	(1)	YES	NO	\$ _____	YES	NO	_____
	(2)	YES	NO	\$ _____	YES	NO	_____
	(3)	YES	NO	\$ _____	YES	NO	_____
b) Reel(s)	(1)	YES	NO	\$ _____	YES	NO	_____
	(2)	YES	NO	\$ _____	YES	NO	_____
	(3)	YES	NO	\$ _____	YES	NO	_____
c) Lures, tackle boxes, landing nets		YES	NO	\$ _____	YES	NO	_____
d) Live bait equip		YES	NO	\$ _____	YES	NO	_____
e) Fish attracting lights		YES	NO	\$ _____	YES	NO	_____
f) Lure color selector		YES	NO	\$ _____	YES	NO	_____
CAMPING EQUIPMENT:							
a) Trailer or pickup camper insert		YES	NO	\$ _____	YES	NO	_____
b) Tents, sleeping bags, lanterns, stoves, ice chests, etc.		YES	NO	\$ _____	YES	NO	_____

THE FOLLOWING QUESTIONS WILL HELP US TO KNOW MORE ABOUT FISHERMEN.
 THE INFORMATION YOU PROVIDE WILL REMAIN STRICTLY CONFIDENTIAL,
 AND YOU WILL NOT BE IDENTIFIED WITH YOUR ANSWERS.

17. What is your age?

_____ YEARS

18. Are you:

- 1 MALE
- 2 FEMALE

19. What is your approximate annual HOUSEHOLD income before taxes?
 (circle only one)

- | | |
|------------------------|-------------------------|
| 1 UNDER \$10,000 | 7 \$60,000 to \$69,999 |
| 2 \$10,000 to \$19,999 | 8 \$70,000 to \$79,999 |
| 3 \$20,000 to \$29,999 | 9 \$80,000 to \$89,999 |
| 4 \$30,000 to \$39,999 | 10 \$90,000 to \$99,999 |
| 5 \$40,000 to \$49,999 | 11 \$100,000 AND ABOVE |
| 6 \$50,000 to \$59,999 | |

20. What is the zip code of your current home residence? _____

Did you purchase any of the following items since this time last year	Purchase price	Was the item, or most of the items purchased in Texas?	Percent of time item was used for saltwater fishing.
(please circle)		(please circle)	
BOATING:			
a) Electronic equipment- Radios, depth finder, loran, radar, etc.	YES NO \$ _____	YES NO	_____
b) Boat accessories- anchors, safety equipment, etc.	YES NO \$ _____	YES NO	_____
c) Boat trailer(s) (1)	YES NO \$ _____	YES NO	_____
(2)	YES NO \$ _____	YES NO	_____
d) Boat motor(s) (1)	YES NO \$ _____	YES NO	_____
(2)	YES NO \$ _____	YES NO	_____
e) Boat(s) (except for items listed above)	(1) YES NO \$ _____	YES NO	_____
(2)	YES NO \$ _____	YES NO	_____
VEHICLES:			
Auto, van, pickup, recreational vehicle, all terrain vehicles. Specify type:			
a) _____	(1) YES NO \$ _____	YES NO	_____
b) _____	(2) YES NO \$ _____	YES NO	_____
OTHER EQUIPMENT:			
Expenditures not listed above (specify):			
a) _____	(1) YES NO \$ _____	YES NO	_____
b) _____	(2) YES NO \$ _____	YES NO	_____

IS THERE ANYTHING ELSE YOU WOULD LIKE TO SHARE WITH US?

YOUR CONTRIBUTION TO THIS EFFORT IS GREATLY APPRECIATED. PLEASE
RETURN YOUR COMPLETED QUESTIONNAIRE IN THE STAMPED RETURN ENVELOPE
AS SOON AS POSSIBLE.

TEXAS A&M UNIVERSITY
DEPARTMENT OF RECREATION AND PARKS
COLLEGE STATION, TX 77843

Appendix B. Distribution data for age by gender, length of residence, length of longest boat owned and number of years fishing in saltwater.

Figure B.1 Percent of Male Saltwater Anglers by Age (n=3373)

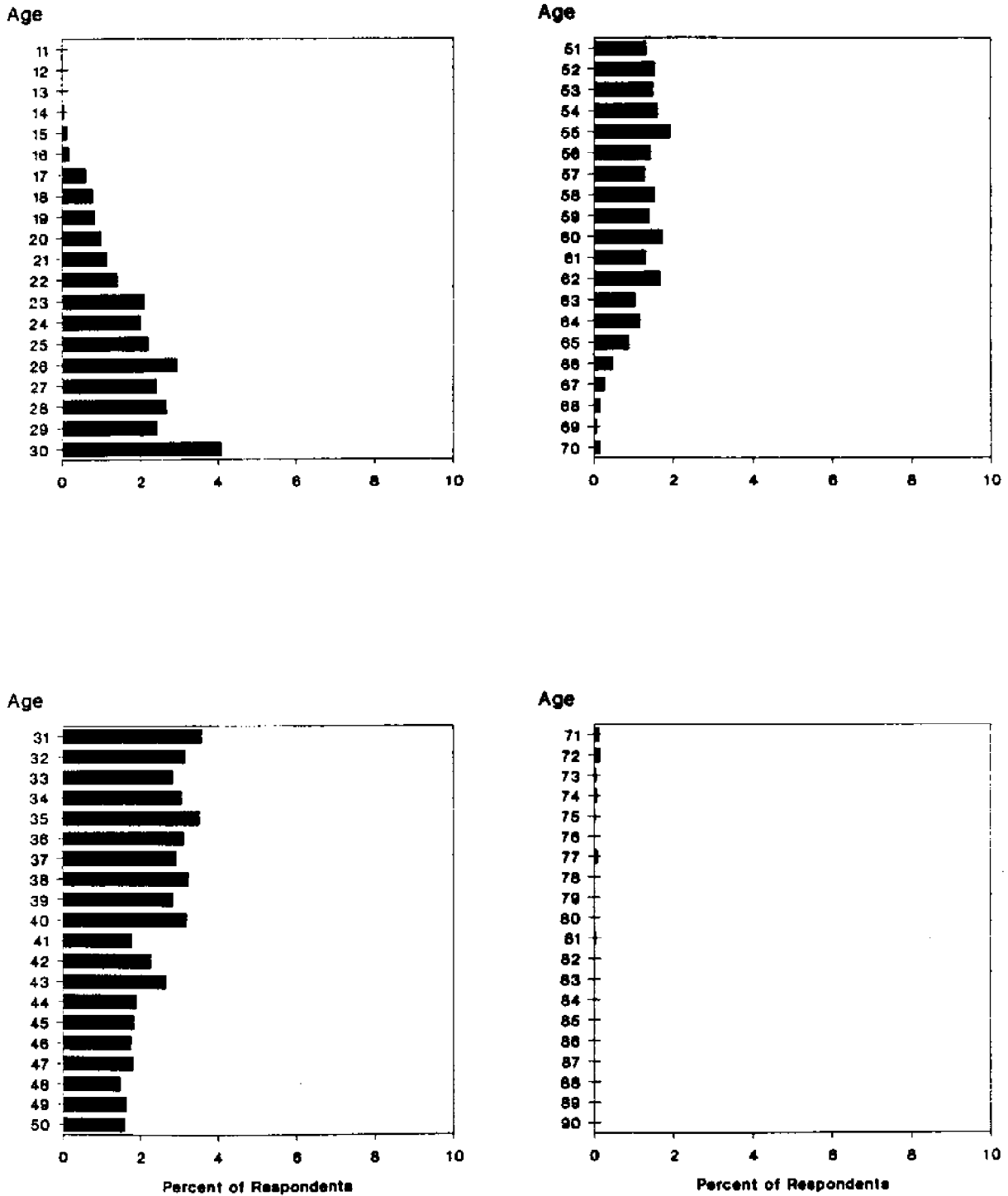


Figure B.2 Percent of Female Saltwater Anglers by Age (n=811)

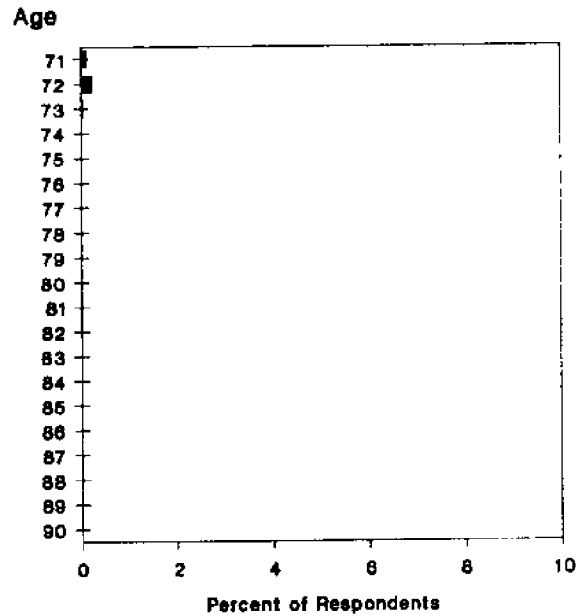
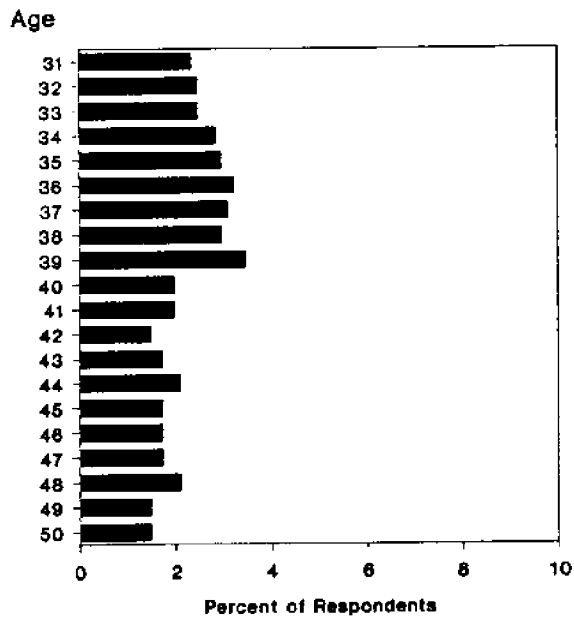
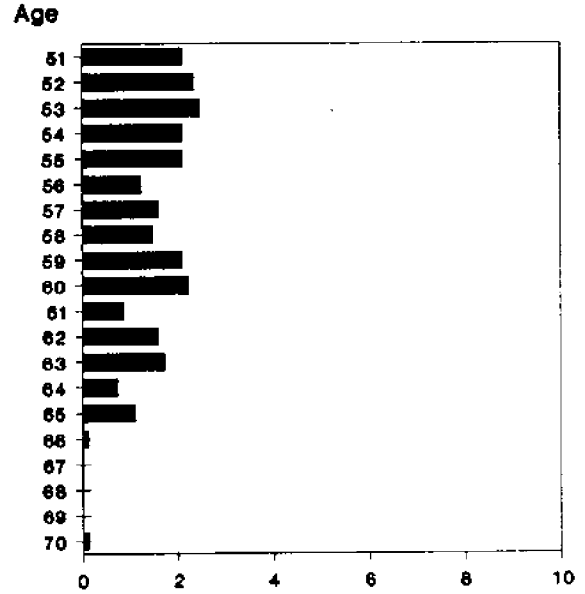
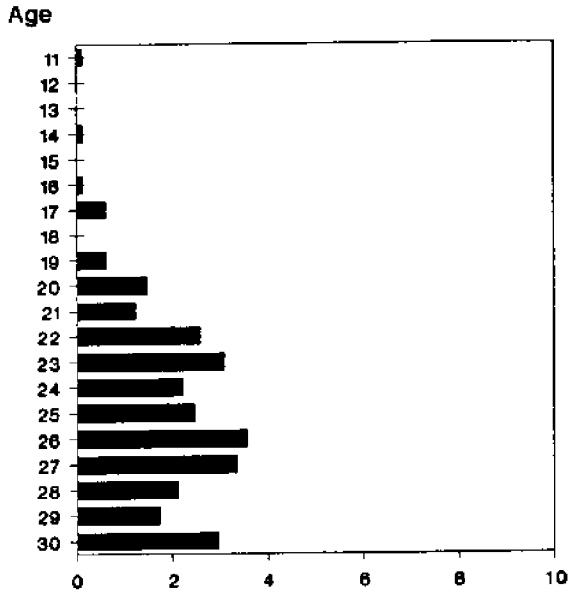


Figure B.3 Percent of Saltwater Anglers by Length of Residence in Texas (n=3672)

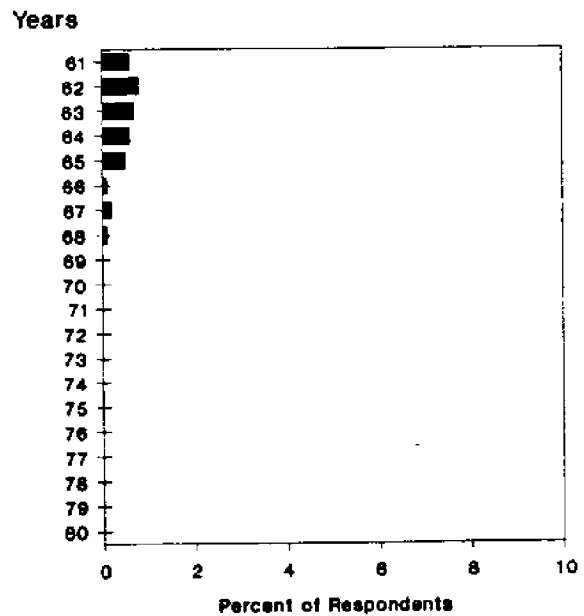
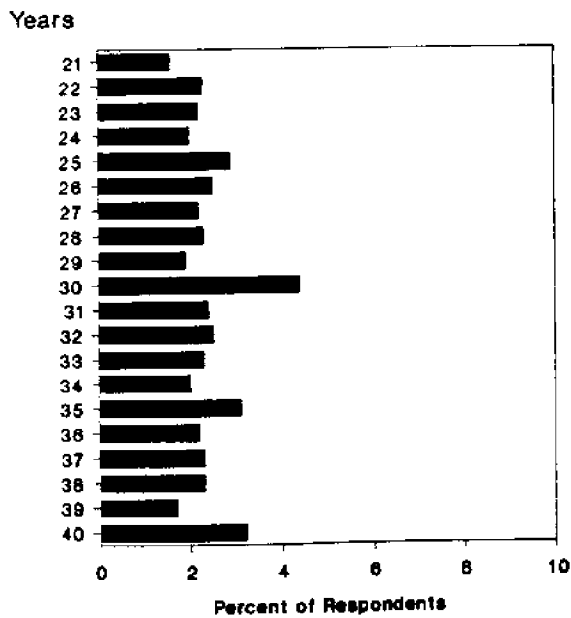
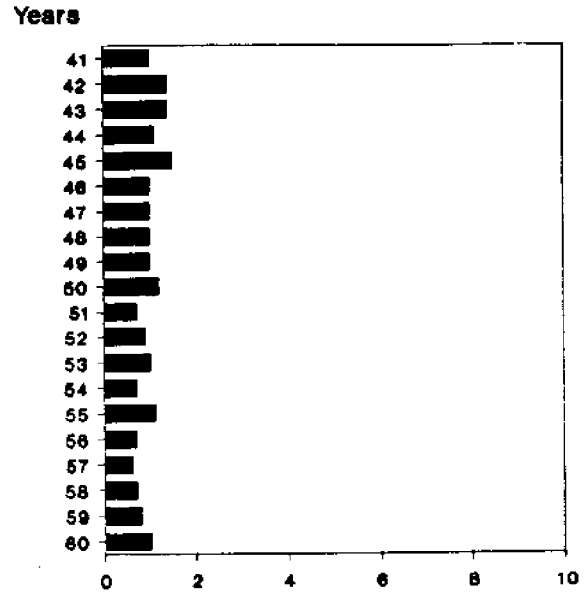
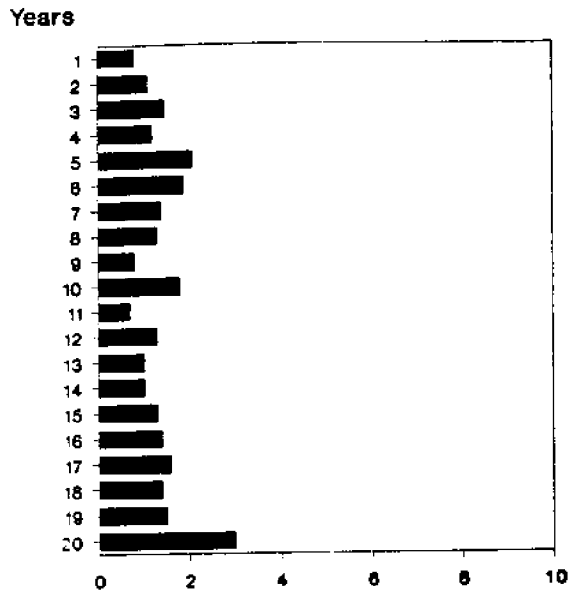


Figure B.4 Percent of Saltwater Anglers by Length of Longest Boat Owned (n=2274)

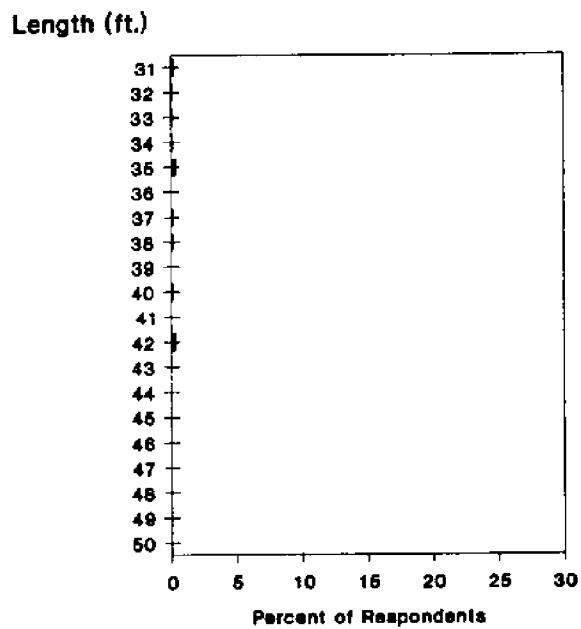
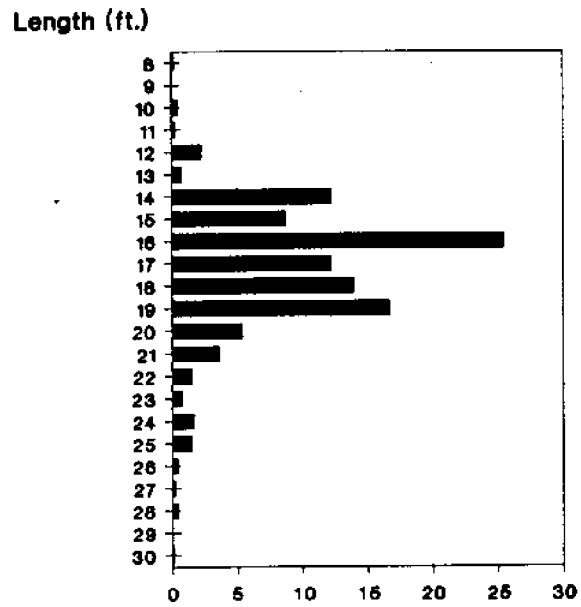
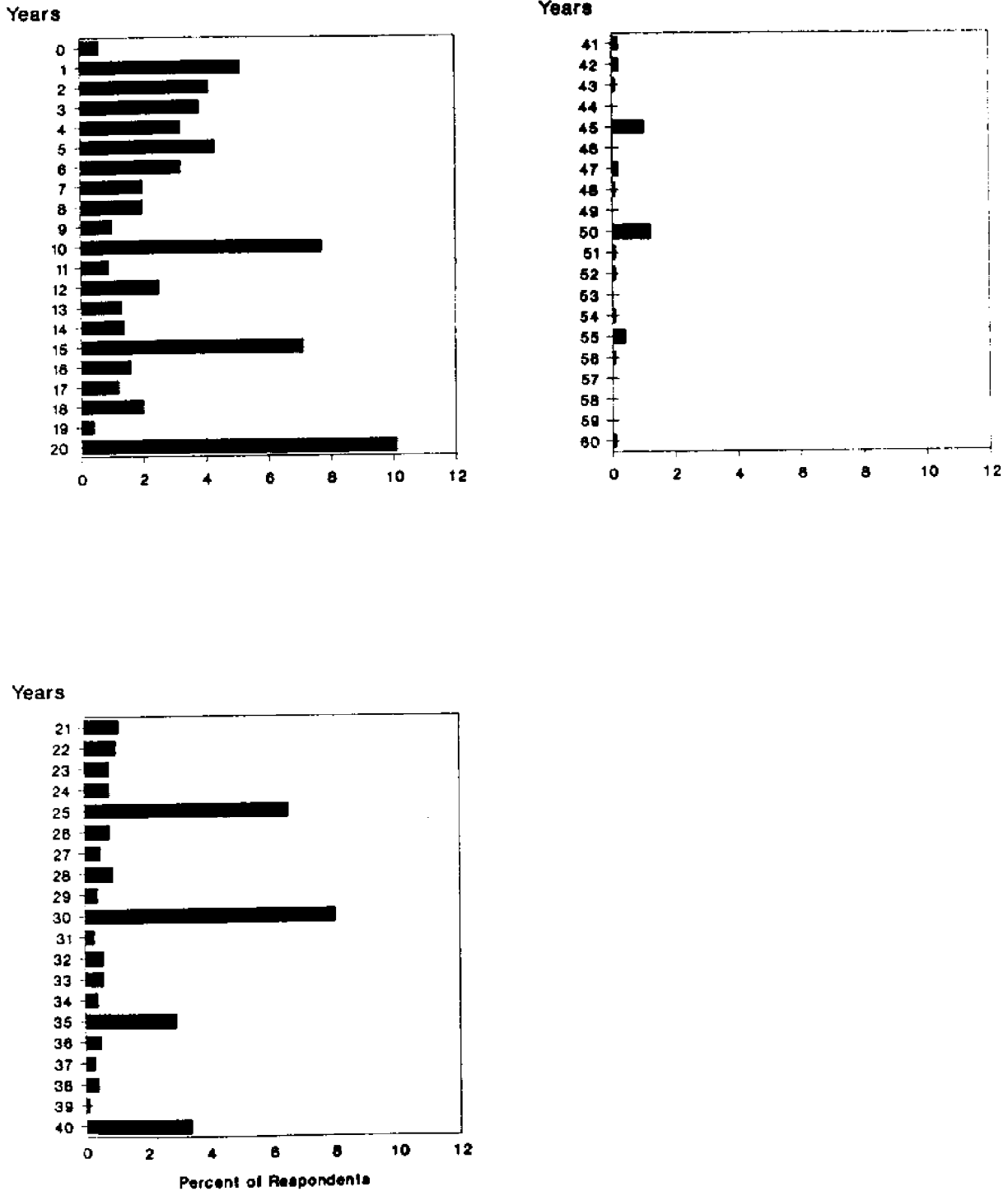


Figure B.5 Percent of Saltwater Anglers by the Number of Years They Have Been Fishing in Saltwater (n=4094)



Appendix C. Expenditures on equipment item(s) by survey respondents, 1986,
for all species.

Table C-1. Expenditures (dollars) on equipment item(s) by survey respondents, 1986, for all species. SW denotes saltwater.

Description of item(s)	Mean \$ spent per person	Median \$ spent per person	Maximum \$ spent	% respondents buying at least one	% mean spent for SW fishing in Texas	Avg. \$ spent in Texas per person	Avg. \$ spent per person for SW fishing	Avg. \$ spent per person for Texas SW fishing
Tackle								
Rods	49.62	30.00	890	75	75	48.17	37.13	36.23
Reels	39.39	0.00	1,500	35	72	38.35	28.43	27.53
Lures, tackle boxes, landing nets, etc.	42.37	20.00	995	67	74	41.69	31.38	31.06
Live bait equipment	13.64	0.00	750	38	85	13.60	11.56	11.54
Fish attracting lights	6.73	0.00	8,000	5	60	6.70	4.01	4.00
Lure color selector	1.53	0.00	480	4	50	1.41	0.77	0.76
Subtotal								111.12
Camping Equipment								
Trailer or camper	191.05	0.00	30,000	5	12 ^a	177.48	22.72	22.52
Tents, sleeping bags, lanterns, stoves, ice chests, etc.	36.83	0.00	1,500	36	10 ^b	36.08	3.75	3.67
Subtotal								26.19
Boating								
Electronic equipment; depth finders, fish locators, radio, etc.	37.02	0.00	7,000	9	71	33.40	26.26	23.32
Boat accessories; anchors, safety equipment, etc.	20.34	0.00	900	20	73	19.93	14.78	14.41
Boats	925.88	0.00	65,000	22	71	890.13	659.60	625.43
Boat motors	502.81	0.00	13,000	23	72	498.10	363.48	360.51
Boat trailers	139.61	0.00	6,500	18	76	138.70	105.58	105.03
Subtotal								1,128.70