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An Economic and Biological Evaluation of the South Carolina Pier Fishery

Donald L. Hammond and David M. Cupka

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by

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and

David M. Cupka

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Introduction

The South Carolina pier fishing industry is located mainly along the Grand Strand area which extends from the North Carolina state line southward to Georgetown, S.C. (Figure 1). Thousands of anglers visit these piers weekly. The piers rely heavily on anglers from out-of-state and non-coastal areas of South Carolina for the major portion of their clientele. Consequently, their business closely follows the pulse of the area's tourism.

Easy access to a fishing site and the usual willingness of the spot, *Leiostomus*

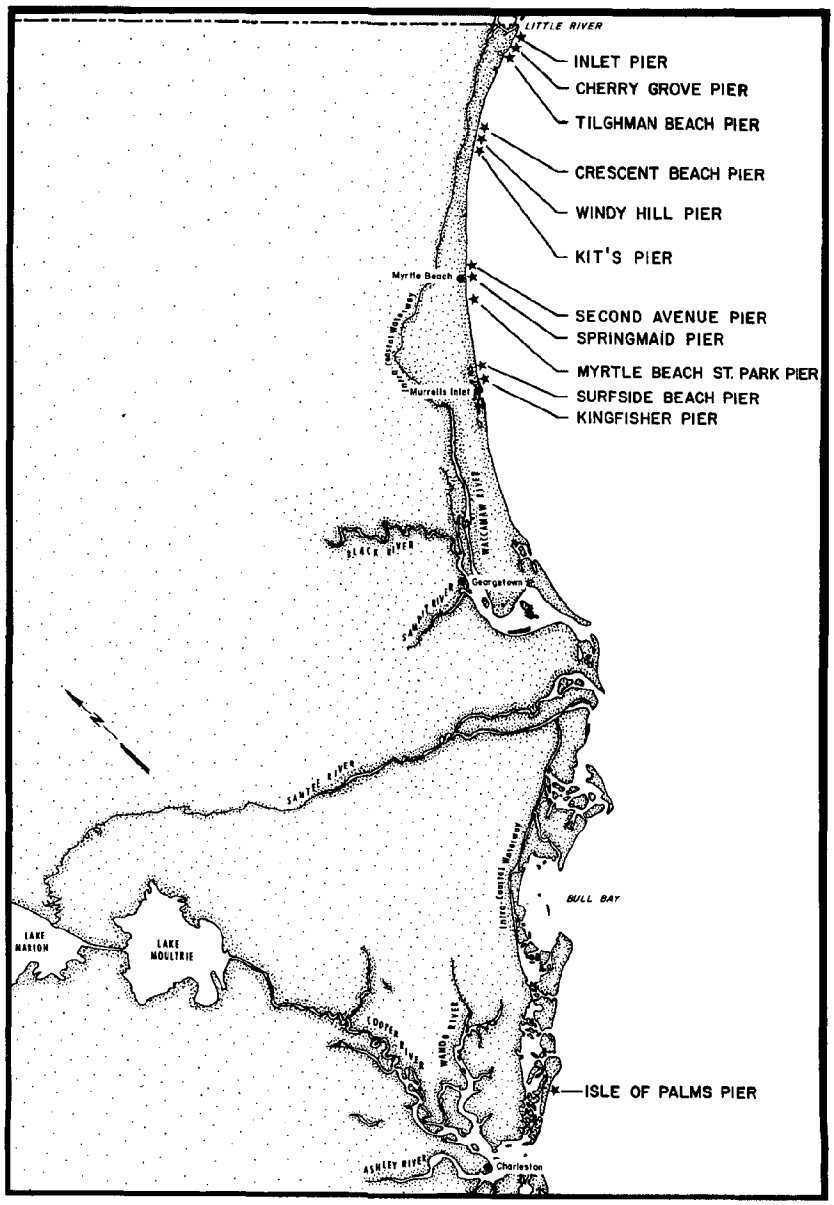

Figure 1. Locations of South Carolina's public fishing piers in 1974.

xanthurus, to bite a baited hook are the chief contributors to the popularity of the South Carolina piers. The ease with which one may fish from piers, coupled with the relatively inexpensive tackle that is required, lends a relaxed attitude to this sport. The other key element, the spot, provides action for anglers throughout the fishing season but reaches peak abundance during its fall migration, at which time hundreds of anglers turn out to harvest this delicious food fish.

The piers are generally open from the first of April until the end of November and will often re-open for a few days at a time in winter when the weather is favorable. Operating hours are generally from 6 or 7:00 AM until 10 or 11:00 PM. During the summer, many piers remain open all night. All of the piers are lighted to allow night fishing. A wide selection of baits such as dead shrimp, bloodworms, mullet and earthworms are available at each pier, along with a complete line of fishing tackle and rental rod and reel outfits. Snack bars or restaurants are usually available at the piers.

Annual and daily admission tickets are available at most piers. Local residents are the primary purchasers of annual tickets. These allow the angler to fish each day of the year without further charge. The daily ticket allows the angler to fish only on that day, though he may leave and return to the pier as often as he desires. Annual tickets cost from $15 to $25 while the daily tickets usually cost $1.25 per person. Some of the piers have reduced rates on daily tickets for children, 50¢ to 75¢ per child.

This survey was designed to evaluate the pier fishing industry in South Carolina, using pier admission tax records and personal interviews with anglers. One of the main areas of interest in the survey was the direct economic impact to the area by the pier industry. Another major concern was the type and quantity of fish being harvested. Information was also gathered on general characteristics of pier anglers.

Methods

Monthly attendance records for each of the twelve ocean fishing piers along the South Carolina coast were obtained through the South Carolina Tax Commission. Because of personnel limitations, sampling was limited to four of the twelve ocean fishing piers operating in 1974. The piers were divided into two categories based on annual attendance figures derived from pier admission tax records - those piers with an annual attendance less than 24,500 and those whose attendance exceeded this figure (Table 1). Two piers were then selected from each category. These were Inlet Pier and Isle of Palms Pier (representing piers of less than 24,500 attendance), and Myrtle Beach State Park Pier and Surfside Pier (representing piers with an annual attendance greater than 24,500 people).

Since tax records from previous years revealed that those piers having an annual attendance greater than 24,500 anglers accounted for roughly 75 percent of the total attendance, the sampling was stratified so that the large pier representatives (Myrtle Beach State Park Pier and Surfside Beach Pier) received 75 percent of the sampling effort and the other group (Inlet Pier and Isle of Palms Pier)

Table 1 Projected angler attendance (angler days) for each public pier, April through November, 1974.

Pier	April	May	June	July	August	September	October	November	Total
Second Avenue	747	496	449	825	975	825	876	320	5513
Crescent Beach	147	159	650	1285	956	648	784	119	4748
Cherry Grove	1386	1571	3519	6230	3188	4639	6346	1815	28694
Inlet	344	542	1123	2054	907	1375	2923	582	9850
Isle of Palms	951	1554	2647	2041	1469	950	869	699	11180
Kingfisher	0	1719	2906	3855	3064	2822	6727	3586	24679
Surfside	5161	3625	6006	10927	5266	493	6840	2919	41237
M.B. State Park	1599	2237	4007	5165	3425	3229	5163	2558	27383
Windy Hill	1659	1768	3414	4684	3579	2615	4935	1348	24002
Kits	589	299	1311	1829	1263	487	1246	0	7024
Tilghman Beach	122	418	872	1433	965	489	1121	222	5642
Springmaid	5044	4211	3629	5389	5816	3861	7234	2625	37959
TOTAL	17749	18599	30533	45717	30873	22433	45214	16793	227,911

were sampled on 25 percent of the sampling days.

Each sampling day was divided into two sampling periods (9AM - 11AM and 2PM - 4PM). Ten days were sampled each month which resulted in a total of twenty sampling periods per month. The ten sampling days each month were stratified so that the sampling occurred on six week days and four weekend days. The twenty sampling periods were then stratified so that the two piers representative of those receiving 75 percent of the attendance were sampled during fifteen sampling periods, and the other two received the balance of the sampling. The actual sampling dates and time periods for each pier were then selected randomly for each month resulting in an overall stratified random sampling scheme.

On each sampling day, two members of the Recreational Fisheries Section stationed themselves at a convenient location on the pier so that they could interview anglers leaving the pier during the sampling period. After briefly identifying themselves and presenting the purpose of the survey, they proceeded to ask the cooperating angler (or spokesman for a group of anglers leaving together) a series of questions (Figure 2). On several occasions all of the groups of anglers leaving could not be interviewed because Section personnel were already engaged in an interview or the departing anglers were not willing to be interviewed.

The fish which were caught were classified into two categories, those retained and those that were thrown back or given away. Attempts were made to identify, count and record the total length, in mil-

Figure 2. Interview form employed.

No. _____

PIER SURVEY

Morning_____

Pier_____ Date_____ Afternoon_____

1. Residence of party _____
(City) (State) (Zip Code)

2. Number of people in party _____

3. Total time fished_____

4. How many nights will you stay in area_____

5. Where will you stay: Friends-relatives_____ Motel_____
Campground_____ Second home_____ Rent_____

6. Best estimate of expenditures for the following categories during trip:
Bait and tackle_____ Lodging_____ Food_____ Gas & Oil_____

7. Did you come to this area strictly to fish? Yes_____ No_____
If No, what other activities attracted you to this area?_____
_____

8. How many pier fishing trips do you generally make a year in South Carolina?_____

9. Species sought_____

10. Bait generally used_____

11. Species caught but not retained — Number

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

limeters, of as many retained fish as possible. In some cases this was impossible because the fish had already been cleaned. Under these circumstances, attempts were made to identify the fish and record the number taken for each species. The identification of those fish not retained was mainly based on the angler's knowledge or from a description provided by the angler. When fish could not be identified, they were deleted from the interview record.

The pier anglers were classified into one of three categories based on their place of residency; local residents, in-state residents residing outside the immediate area of the pier, and out-of-state residents. These three categories were further sub-divided into those anglers who came to the area strictly to fish and those who came to the area for other reasons.

To determine the distance traveled by pier anglers, concentric rings of fifty miles separation were drawn around each pier on a highway map of the eastern United States. Then each angler's residence was located on the map. Several of the residences could not be located. It was assumed that these were randomly spaced on the map, consequently not affecting the data. The number of anglers residing in each divisional ring was calculated as a percentage of the total number of interviews which were pin-pointed as lying within each respective division.

Another item determined was the number of days spent in the area by in-state and out-of-state anglers. The length of stay for each category was figured by taking each interview and multiplying the number of anglers in the party by the number of nights spent in the area. Then the angler days were totaled and divided by the number of anglers involved to arrive at the average number of days spent in the area by the anglers of each category.

A comparison was made of the annual pier visits by anglers from each of the three categories. It was assumed that those people interviewed represented a normal cross-section of pier anglers. The average number of pier visits for each category was derived by totaling the number of visits for each of the categories of anglers and dividing by the number of interviews.

The data on expenditures from all interviews were divided into the three residency categories for summarization. When an angler gave a range of expenditures for a commodity the average of the range was used. The total expenditure for each residency category was derived, and then divided by the number of anglers involved. This gave the individual cost per trip which was further divided by the average number of days spent in the area so as to arrive at the daily cost per individual for each category. The economic evaluation for the four primary sectors (Figure 2, question 6) surveyed was expanded using the three residency divisions and their average daily costs to encompass the South Carolina pier fishery as a whole.

Projected total number of individuals landed for the six dominant genera of fish was based on the assumption that the monthly genera catch per unit of effort (fish per angler hour) observed on the four piers sampled was representative of all the piers. This catch rate was then expanded by using the total projected effort (angler hours) for all piers to estimate the total number of individuals of a genera harvested.

Total biomass was calculated for the projected harvest of the four major genera of the drum family, Sciaenidae, which comprised the bulk of the pier catches. This calculation was based on the assumption that length measurements and monthly catch per unit of effort for each species were representative of the entire pier fishery. The length-weight formula, $\log w = a + b \cdot \log l$, was used to calculate biomass estimates for these four genera. In the formula, log w was in grams and log l was in millimeters total length. The values of the constants used in the formulae are from Shealy, et al (In prep.) and are as follows: spot, $a = -4.852$, $b = 2.979$; Atlantic croaker, $a = -5.161$, $b = 3.073$; kingfish, $a = -4.970$, $b = 2.951$; and silver perch, $a = -5.311$, $b = 3.198$.

Results

A total of seventy-eight days was sampled from April through November 1974 at which time sampling was terminated because the piers had ceased normal operations. A total of 880 interviews were generated. These involved 1,751 anglers which represented 2.0 percent of the attendance recorded for the four piers during this period. An estimated 227,911 angler days were spent on the piers during this survey. The anglers were estimated to have harvested 923,391 fish in 746,612 hours of effort.

ATTENDANCE

The monthly pier attendance (Table 1) reached its major peak in July, coinciding with the peak in the tourist trade for the Grand Strand area. A secondary peak in October is a reflection of the enthusiasm anglers have in catching the spot, *Leiostomus xanthurus*, during its annual fall migration through the Myrtle Beach area. Lowest monthly attendance occurred in November and was partly a result of inclement weather conditions during this period.

Of the projected 25,000 anglers who attended the piers during the study, out-of-state anglers accounted for 57.2 percent of the attendance.

Table 2. Angler attendance and economic projections for South Carolina pier fishery, April through November, 1974.

	Projected Number of Angler Days	Average Trip Expense	Average Angler Daily Expenditure	Projected Annual Expenditure	Projected Pier Fees	Projected Gross Expenditure	Percent of Anglers Strictly to Fish	Projected Number of Angler Days by Anglers Strictly to Fish	Projected Total Expenditures by Anglers Strictly to Fish
Local Residents	37,617	$ 3.09	$ 3.09	$ 116,237	$ 44,476	$ 160,713	97.97	36,853	$ 157,450
In-state Residents	59,874	41.97	10.71	641,251	70,793	712,044	54.65	32,721	389,132
Out-of-state Residents	130,420	69.21	10.50	1,369,410	154,203	1,523,613	39.10	50,994	595,732
Total	227,911	46.37	9.33	2,126,898	269,472	2,396,370	52.90	120,568	1,142,314

In-state anglers constituted 26.3 percent of the pier attendance, while the local residents accounted for only 16.5 percent of the attendance (Table 2). The monthly attendance composition (Figure 3) showed significant variations among the months. Out-of-state anglers reached their highest percentage level in June at 68.8 percent, while during May they were at their lowest level. The in-state anglers reached their peak percentage in May, 35.2 percent, dropping the following month to a low of 19.1 percent. Local anglers constituted the lowest percentage in every month.

The majority (52.9 percent) of the pier anglers traveled to the coast strictly to fish. Among the three groups the local residents had the highest percentage rate of people who came strictly to fish, 98.0 percent. Over half, 54.6 percent, of the in-state residents came to the area to fish while 39.1 percent of the anglers from out-of-state came to the area solely because of the fishing.

ANGLER RESIDENCY

The data indicated that 88.5 percent of the anglers lived within 250 linear miles of the piers. More anglers, 34.2 percent, resided between 150 to 200 miles

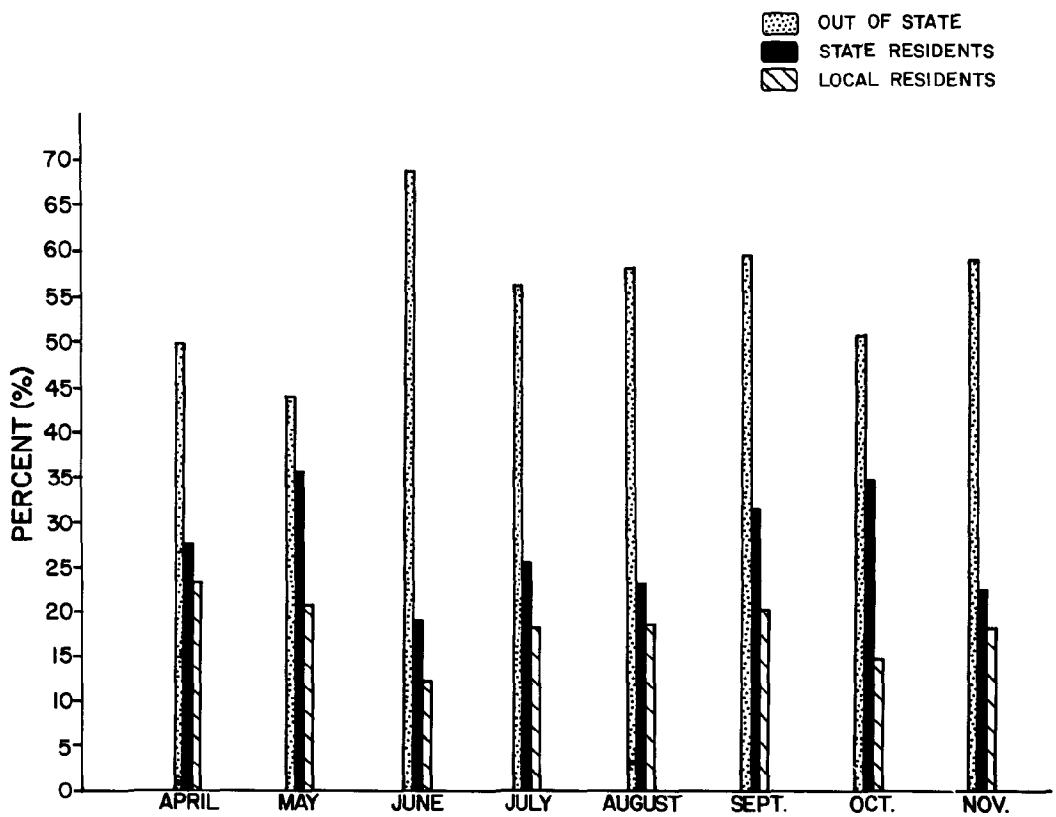

FIG. 3. MONTHLY COMPOSITION OF PIER ANGLERS IN REGARD TO THEIR RESIDENCY CATEGORY

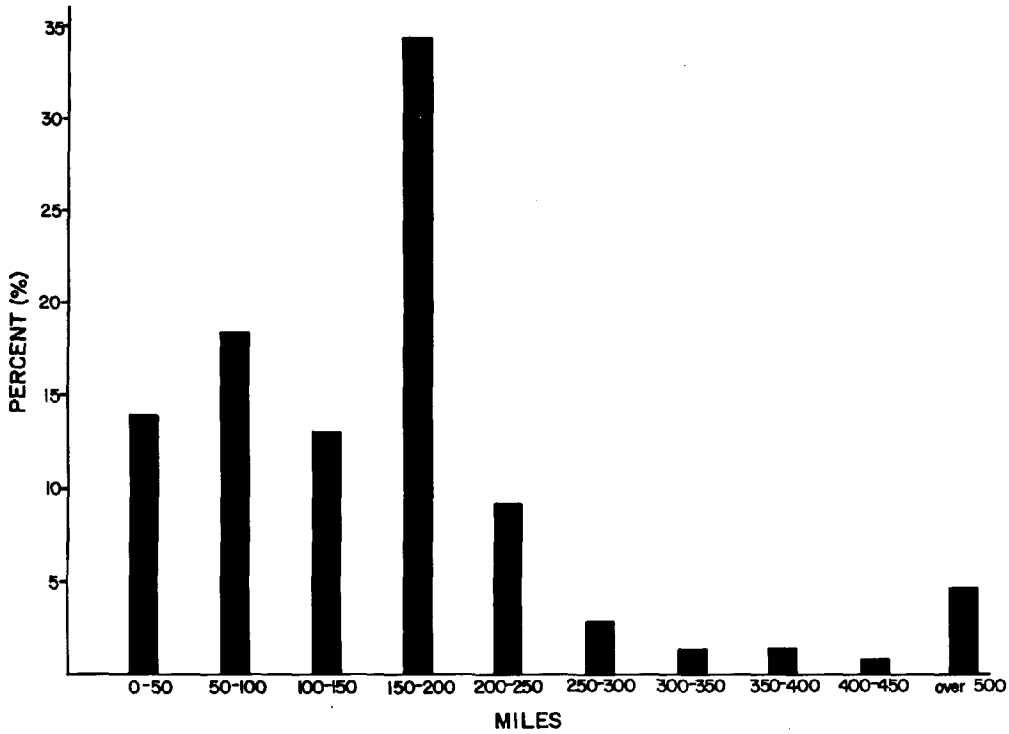

FIG. 4. DISTANCE TRAVELED BY ANGLERS FISHING ON SOUTH CAROLINA PIERS

(Figure 4) from the pier on which they fished than any other area. This area contains most of the large metropolitan areas of North Carolina (e.g. Durham, Greensboro, Winston-Salem, and Charlotte) along with several of the large metropolitan areas of both South Carolina and Georgia. The area between 50 and 100 miles contributed the second highest percentage of people, 18.4 percent. These anglers were mostly day anglers with the majority of them returning home at night. Anglers from states to the north and northwest of South Carolina represented the largest portion of the pier users.

LODGING

The data showed a difference in lodging preference between the in-state and out-of-state residents (Table 3). The preferred accommodation by both groups was the motel, but the proportion of the people which patronized them showed a significant variation. More than a third, 35.6 percent, of all out-of-state anglers preferred motels compared to 18.8 percent of all in-state anglers. Another notable item was that 4.4 percent of the out-of-state anglers did not spend at least one night in the area while 28.8 percent of the in-state residents came to the area for only that particular day. Motel and campground lodging accounted for over 61 percent of the out-of-state residents and 37.1 percent of the in-state residents. A lower percent of the in-state residents patronized rental accommodations possibly because a larger portion of them stayed with either friends or relatives.

DURATION OF VISIT AND ANNUAL PIER TRIPS

Out-of-state anglers tended to stay in the area 68 percent longer, 6.6 nights, than in-state anglers who averaged 3.9 nights per trip. A wide variation was

Table 3 Comparison of lodging preferences for in-state and out-of-state residents presented in percent of total number of anglers for each category.

	Friends and Relatives	Motel	Campground	Second Home	Rent	Day Trip
Out-of-State Residents	8.85	35.61	25.55	8.45	17.10	4.43
In-State Residents	10.48	18.78	18.34	9.17	14.41	28.82

Table 4 Average dollar breakdown spent by pier anglers and projected expenditures for five economic sectors, April through November, 1974.

	Bait & Tackle	Lodging	Food	Gas & Oil	Pier Admission Fees
Percent of Total Expenditure	7.06	36.68	38.42	6.59	11.25
Projected Value	$169,301	$879,047	$920,734	$157,816	$269,472

noted in the estimated number of visits made annually to the piers among the three categories. As would be expected, the local area residents averaged fishing more times annually, 68.7 visits, than did the in-state residents who averaged 18.5 pier visits annually. Out-of-state anglers tended to fish the fewest times from the piers annually, 6.2 visits, even though a visit was generally made each day they were in the area. The average size of the fishing party showed little variation among the three residency categories. The out-of-state and local residents averaged 2.0 persons per party while the in-state anglers averaged 1.9 persons per party.

ECONOMICS

The total amount of expenditures on pier angling trips is a good indicator of the magnitude of this segment of the coastal economy. However, the allocation of the expenditures to sectors of the economy is important for a good understanding of the distribution of benefits (See Table 4). Lodging and food establishments received approximately 75 cents, the petroleum industry approximately 7 cents, and the fishing industry itself approximately 18 cents of each dollar brought into the economy by pier anglers. The fishing industry's benefits arise from pier admission fees and the sale of bait and tackle. Table 4 indicates that the food sector was estimated to directly benefit by over $920,000 from the pier anglers while lodging establishments received direct expenditures of some $879,000. The sale of bait, tackle and pier admission fees resulted in pier operators receiving an estimated $438,000. Local petroleum dealers directly benefited by an estimated $157,000.

The economics of the pier fishery were analyzed in regard to the three residency categories (Table 2). This analysis showed that even though the out-of-state angler spent more money per trip ($69.21) than the others, in-state anglers spent slightly more on a daily basis. The local pier anglers who were treated as daily visitors, averaged spending the least per day, $3.09. Due to longer trips and the fact that out-of-staters were the predominant users of piers, their $1.5 million of expenditures was the highest of the categories. The in-state angler category accounted for approximately $712,000. Projected expenditures by the local residents trailed far behind the other categories at slightly over $160,000. During this eight month period, an estimated $2.4 million was spent by anglers during 228 thousand angler days. Considering all monies spent by anglers who came strictly to pier fish, plus all other expenditures on bait, tackle and admission fees, $1.3 million can be attributed to the South Carolina Pier Fishery for the eight month period from April through November, 1974.

ANGLING EFFORT

Average angling time per trip by month generally ranged between 2.6 hours and 3.5 hours except in November when a large increase was noted, 4.6 hours (Figure 5). Overall, the anglers spent an average of 3.3 hours fishing per visit each month. More angling effort was exerted in October, 156,000 angler hours, than in July which had the highest angler attendance but only 142,600 angler hours of effort (Figure 6). Similarly, November ranked eighth in attendance but fifth in effort. April, June and August remained in the same relative position as far as effort and attendance were concerned. The projected total monthly effort ranged from slightly over 49,000 hours in May to nearly 156,000 hours in October. An estimated 746,000 angler hours were expended on the piers during this eight month period.

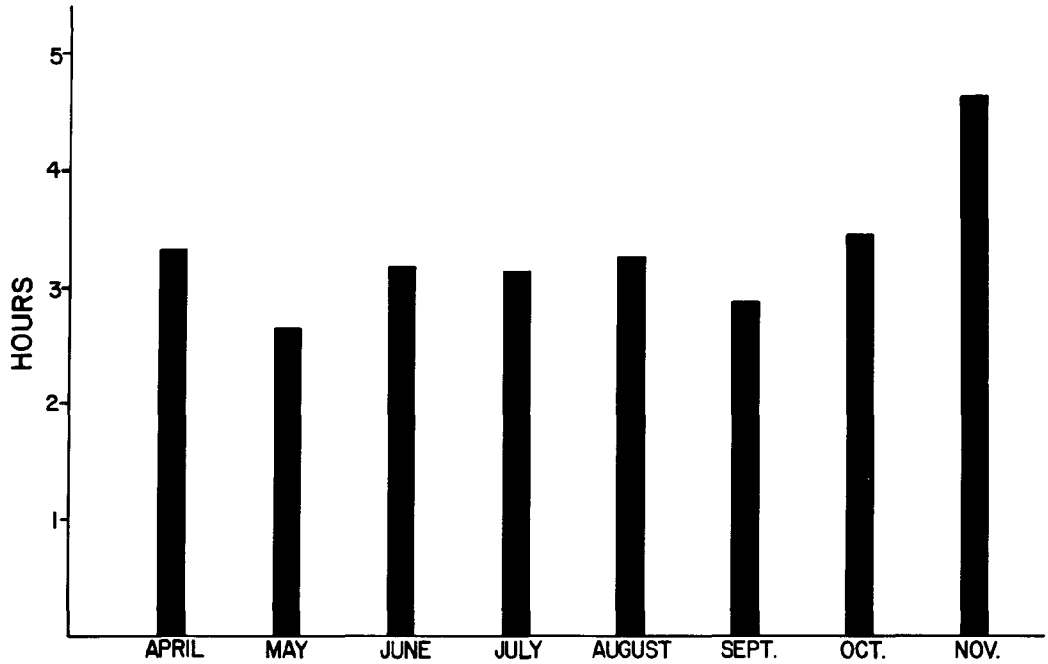

FIG. 5. AVERAGE TIME SPENT FISHING BY PIER ANGLERS PER TRIP ON A MONTHLY BASIS

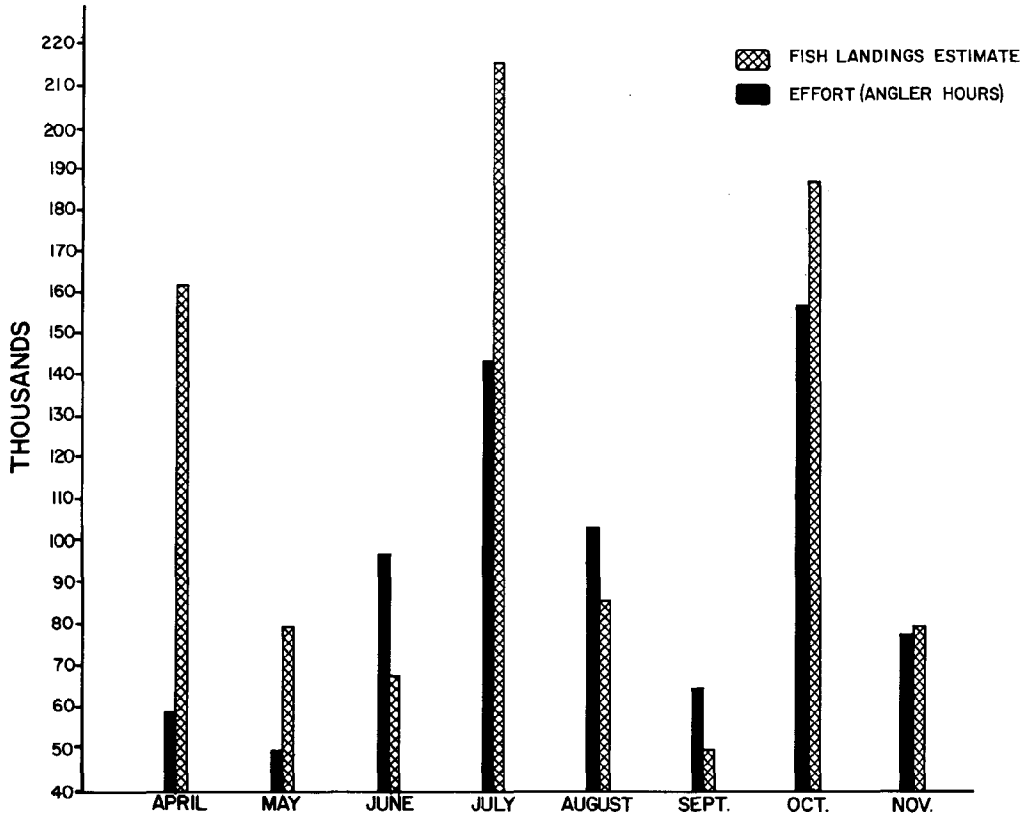

FIG. 6. PROJECTED EFFORT (ANGLER HOURS) AND NUMBER OF FISH HARVESTED FOR THE TWELVE PUBLIC PIERS

BIOLOGY

Of the 1751 anglers interviewed, 72% caught at least one fish. Successful anglers interviewed during the survey harvested 8.109 fish (Table 5). Thirty-nine percent of these fish were either thrown back or given away. A total of 58 species representing 28 families were documented as entering the landings of the pier fishery (Table 5). Though the majority of these species were seldom consumed, 25 of the species are noted food fish. Three additional species, Urophycis regius, and U. floridianus, (representing one additional family, Gadidae) and Scomberomorus cavalla were observed to enter the fishery but were not documented in the interviews.

Monthly catch-per-unit-of-efforts (CPUE) fluctuated between 0.73 fish-per-angler-hour (FPAH) in June and 2.74 FPAH in

Table 5. Observed fish landings for the four South Carolina piers surveyed, April through November 1974.

	April	May	June	July	August	September	October	November	Total
Spot, *Leiostomus xanthurus*	445	176	289	405	84	120	1055	306	2880
Atlantic croaker, *Micropogon undulatus*	628	359	272	521	190	80	23	84	2157
Kingfishes, *Menticirrhus americanus* *M. littoralis*	265	237	91	135	97	98	232	221	1376
Silver perch, *Bairdiella chrysura*	287	26	6	6	1	1	20	30	377
Florida pompano, *Trachinotus carolinus*	-	-	2	35	91	127	53	10	318
Bluefish, *Pomatomus saltatrix*	43	60	52	68	19	7	58	10	317
Sea catfishes, *Arius felis*, *Bagre marinus*	14	49	11	41	14	4	3	-	136
Weakfish, *Cynoscion regalis*	13	1	-	5	-	7	46	6	78
Spotted seatrout, *Cynoscion nebulosus*	-	8	6	59	3	-	1	-	77
Seatrout, *Cynoscion spp.*	7	1	-	2	-	2	6	11	29
Sea basses, *Centropristis striata*, *C. philadelphica*	7	1	6	1	4	8	12	15	54
Searobins, *Prionotus tribulus* *P. evolans* and *P. carolinus*	1	-	3	12	23	9	4	1	53
Oyster toadfish, *Opsanus tau*	-	3	16	9	1	5	6	1	41
Requiem and Hammerhead sharks *Carcharhinus limbatus*, *C. milberti*, *C. obscurus*, *Mustelus canis*, *Negaprion brevirostris*, *Sphyrna tiburo*, *S. zygaena*	8	5	6	6	4	-	1	-	30
Atlantic menhaden, *Brevoortia tyrannus*	-	-	27	-	-	-	1	-	28
Stingrays and Eagle rays, *Dasyatis sabina*, *Gymnura micrura*, *Aetobatus narinari*, *Rhinoptera bonasus*	2	1	-	1	-	6	6	5	21
Crevalle jack, *Caranx hippos*	-	-	-	-	11	2	2	1	16
Summer flounder, *Paralichthys dentatus*	3	3	1	-	-	3	3	2	15
Pigfish, *Orthopristis chrysoptera*	-	-	2	1	1	1	4	-	9
Flounders, *Paralichthys spp.*	2	2	1	-	1	-	2	-	8
Butterfish, *Peprilus triacanthus*	-	-	-	-	-	-	3	5	8
Southern flounder, *Paralichthys lethostigma*	-	-	-	-	7	-	-	-	7
Stardrum, *Stelliger lanceolatus*	1	-	-	1	1	-	1	3	7
Black drum, *Pogonias cromis*	-	-	-	-	-	-	4	3	7
Atlantic bumper, *Chloroscombrus chrysurus*	-	-	-	-	-	3	4	-	7
Mullets, *Mugil cephalus*, *M. curema*	-	-	1	1	2	2	-	-	6
Spanish mackerel, *Scomberomorus maculatus*	-	-	-	-	-	6	-	-	6
Red drum, *Sciaenops ocellata*	-	-	-	2	-	1	2	-	5
Pinfish, *Lagodon rhomboides*	-	-	3	2	-	-	-	-	5
Snake eels, *Ophichthus gomesi*, *O. ocellatus*	-	1	-	1	-	2	1	-	5
Atlantic spadefish, *Chaetodipterus faber*	-	-	5	-	-	-	-	-	5
Atlantic cutlassfish, *Trichiurus lepturus*	-	-	-	1	2	-	-	-	3
Ladyfish, *Elops saurus*	-	-	-	-	-	-	3	-	3
Balao, *Hemiramphus balao*	-	-	-	-	2	-	-	-	2
Inshore lizardfish, *Synodus foetens*	-	-	1	-	1	-	-	-	2
Harvestfish, *Peprilus alepidotus*	-	-	-	-	-	-	-	2	2
Puffers, *Sphoeroides maculatus*, *Lagocephalus laevigatus*	-	1	-	-	-	1	-	-	2
Sheepshead, *Archosargus probatocephalus*	-	-	-	-	-	-	1	-	1
Tomtate, *Haemulon aurolineatum*	-	-	-	-	-	1	-	-	1
Windowpane, *Scopthalmus aquosus*	1	-	-	-	-	-	-	-	1
Angelfish, *Holacanthus sp.*	-	-	1	-	-	-	-	-	1
Barracuda, *Sphyraena sp.*	-	-	1	-	-	-	-	-	1
Cobia, *Rachycentron canadum*	-	1	-	-	-	-	-	-	1

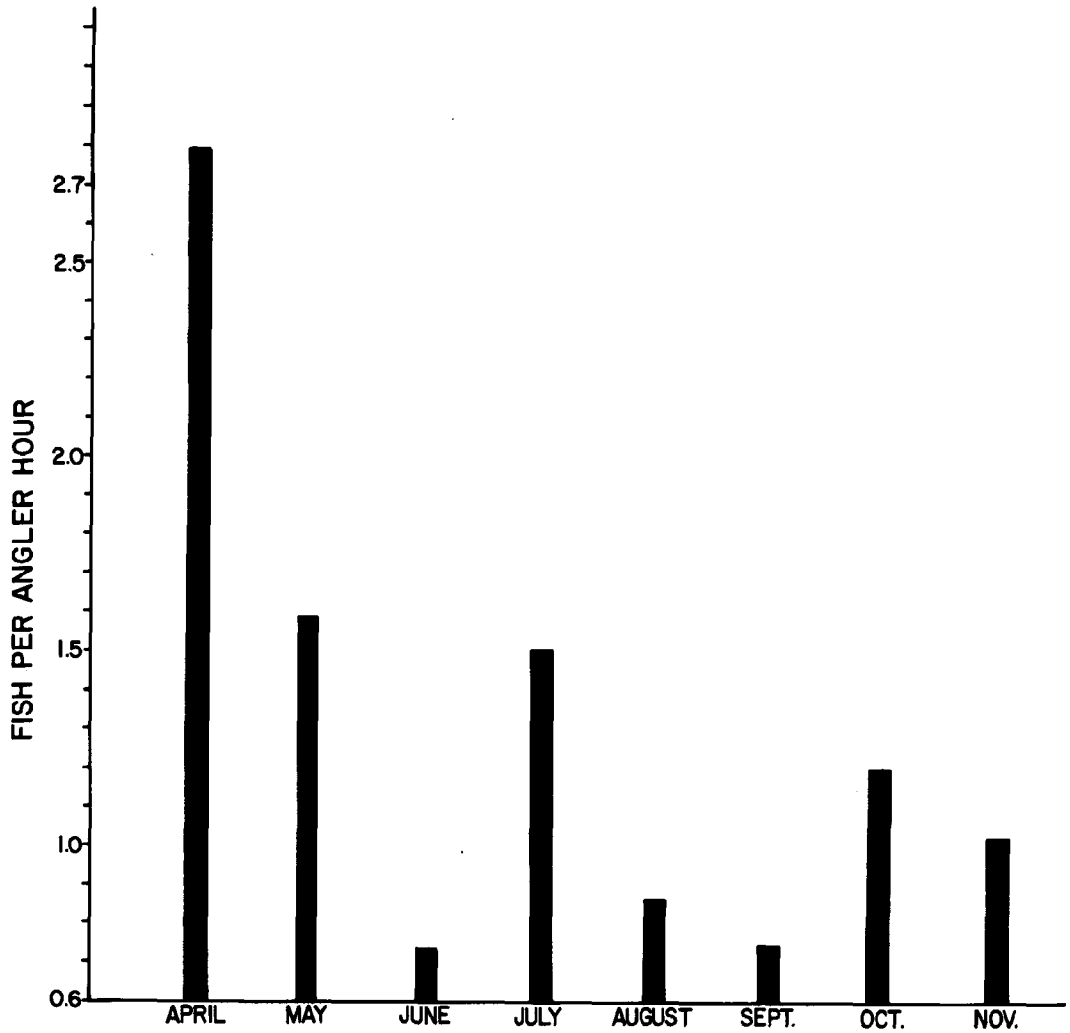

FIG. 7. MONTHLY CATCH-PER-UNIT-OF-EFFORT (FISH PER ANGLER HOUR) FOR ALL SPECIES OF FISH CAUGHT ON THE PIERS

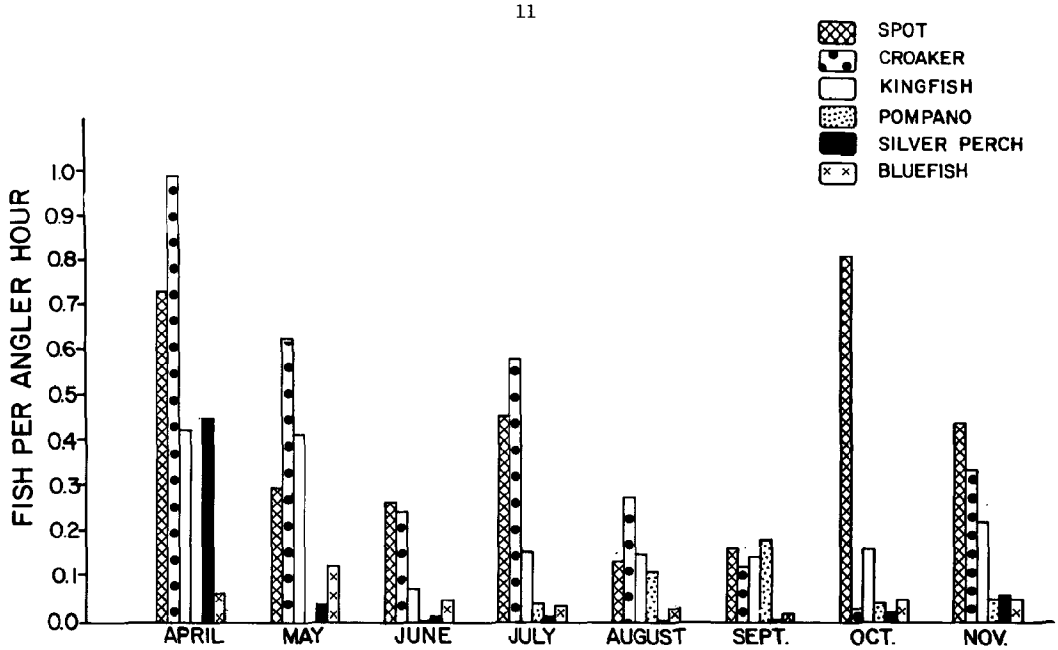

FIG. 8. MONTHLY CATCH-PER-UNIT-OF-EFFORT (FISH PER ANGLER HOUR) FOR THE SIX MOST ABUNDANT GENERA OF FISH

April (Figure 7). Five months (April, May, July, October and November) produced CPUE's above the 1.00 FPAH indicating these as prime fishing months, while the CPUE's for April and May exceeded 1.5 FPAH. Overall, the monthly CPUE averaged 1.24 FPAH.

In a comparison of the monthly CPUE for the six most abundant genera of fish (Figure 8), the Atlantic croaker yielded the single highest monthly CPUE at 1.00 FPAH in April. The second highest monthly CPUE for a single species, 0.81 FPAH for spot occurred during October. Spot produced the highest sustained yield averaging 0.44 FPAH over the duration of the survey. Croaker and kingfish followed with overall CPUE's of 0.33 and 0.21 FPAH respectively.

Using the monthly CPUE as an indicator of species' abundance, anglers interested in catching croaker, kingfish and silver perch would have the most liklihood of success in April and May. Peak catches of bluefish occurred in April and May while pompano were taken chiefly in August and September. Spot displayed two peak months in its productivity, April and October.

Four families of fish accounted for over 96 percent of the fish harvested. These families were the drums (Sciaenidae) with 85.8 percent, the jacks (Carangidae) with 4.6 percent, the bluefishes (Pomatomidae) with 3.9 percent and the sea catfishes (Ariidae) with 1.7 percent. Six genera, Leiostomus, Micropogon, Menticirrhus, Trachinotus, Bairdiella, and Pomatomus, representing three of the families, namely the drums, the jacks and the bluefish, comprised 91 percent of all fish harvested.

Total length measurements were recorded for 2,342 individuals belonging to the dominant six genera. This represented over 31 percent of the actual recorded landings, including those fish not retained during the sampling periods. Over 90 percent of these measurements belonged to

the top four species of the drum family.

As expected, anglers generally retained only the larger specimens caught. Spots harvested during the survey ranged from 126 mm total length (TL) to 280 mm TL with a mean of 213 mm TL (Figure 9). Croakers ranged in size from 160 mm TL to 403 mm TL with a mean of 215 mm TL. The kingfishes ranged from 113 to 405 mm TL, and had a mean total length of 231 mm. Pompano caught from the piers ranged from 114 mm TL to 366 mm TL with a mean length of 193 mm TL. Bluefish varied in size from 145 mm TL to 352 mm TL. The mean size of the bluefish was 245 mm TL. Silver perch, which is a smaller fish, ranged from 130 to 235 mm TL and had a mean length of 178 mm TL.

The projected monthly catch for the six dominant genera (Table 6) accounted for 841,000 individuals, representing 91.2 percent of the total projected catch during the survey. The four drum family members accounted for an estimated 766,000 individuals representing 83 percent of the total estimated catch. The spot alone accounted for 36 percent of the total projected catch from the public piers.

July, which had the highest angler attendance, produced the greatest fish harvest with a projected 214,000 fish being taken (Figure 6). October, which had the highest angling effort produced the second largest catch with an estimated 186,000 fish being caught. September proved to be the least productive month

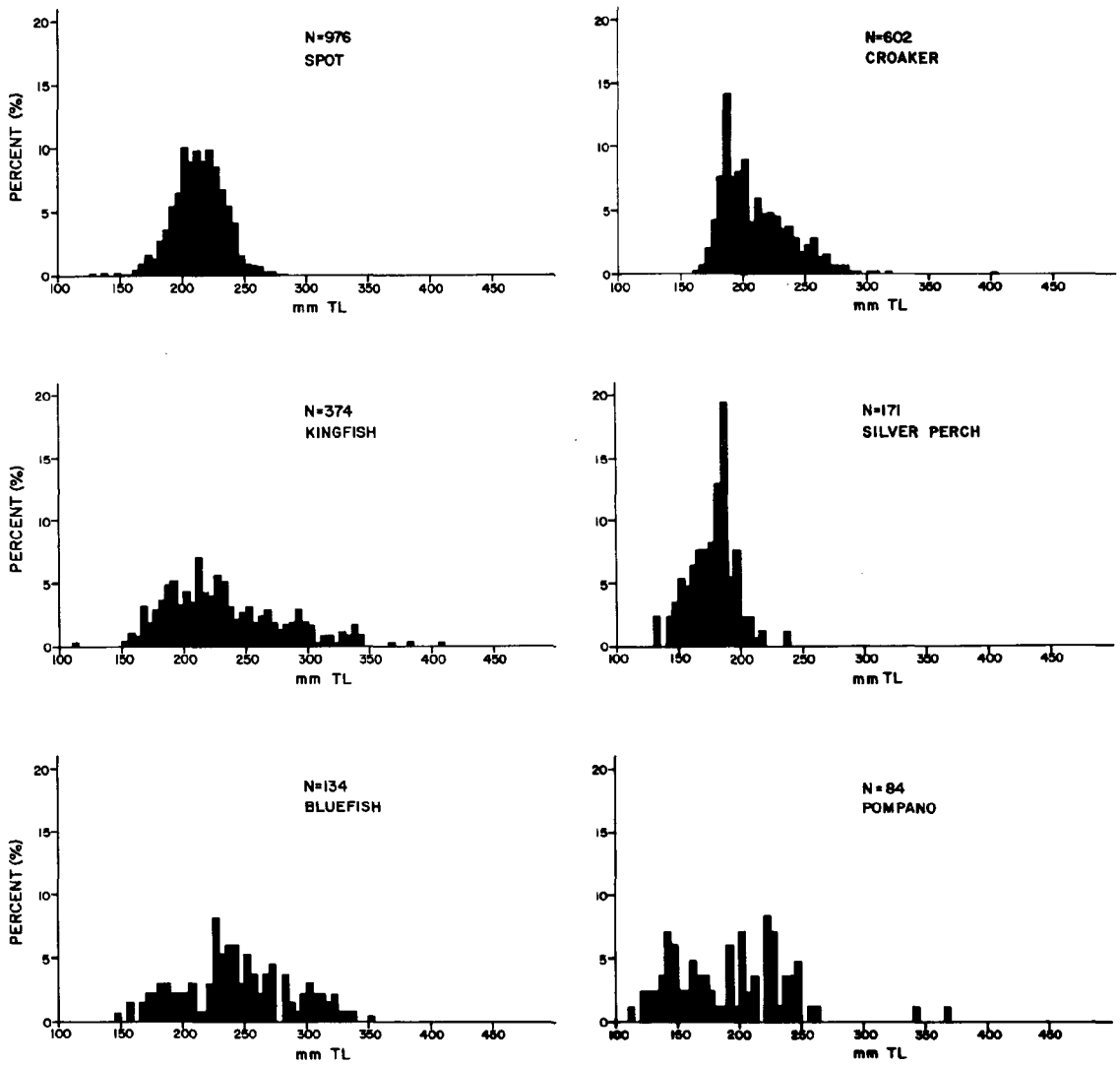

FIG. 9 LENGTH FREQUENCY DISTRIBUTIONS FOR THE SIX DOMINANT GENERA OF FISH CAUGHT ON SOUTH CAROLINA PIERS

Table 6. Projected number of fishes landed by month for the six dominant genera.

	April	May	June	July	August	September	October	November	Total
Spot, *Leiostomus xanthurus*	41687	14697	25450	66027	12866	11616	126350	33513	332206
Atlantic croaker, *Micropogon undulatus*	58832	29976	23953	84926	29101	7746	2761	9202	246497
Kingfishes, *Menticirrhus americanus*, *M. littoralis*	24826	19793	8010	22009	14857	9484	27781	24201	150961
Florida pompano, *Trachinotus carolinus*	-	-	175	5705	13940	12295	6349	1099	39563
Silver perch, *Bairdiella chrysura*	26888	2170	524	984	153	97	2402	3288	36506
Bluefish, *Pomatomus saltatrix*	4031	5008	4583	11083	2911	678	678	6941	35913

in terms of the number of fish harvested. Three months, April, July and October, accounted for almost 61 percent of the fish harvested during the eight month survey period.

Biomass caught during the entire survey period was calculated for spot, croaker, kingfish and silver perch. Over 191,000 pounds of these fish were projected to have been landed on the piers. Spots were calculated to account for the largest proportion, 91,000 pounds, while the croaker followed in second place with 54,000 pounds. Kingfish, which ranked third in both number of individuals harvested and in poundage, produced an estimated 38,000 pounds. The total catch for silver perch, which is a notably smaller species of fish, was projected to be 8,000 pounds. This 191,000 pounds represents only 83 percent of the individual fish harvested during the eight month period. Thus, a reasonable estimate would be that over 220,000 pounds of fish were harvested from the piers during the course of this survey.

BAIT PREFERENCE

Though many anglers used a variety of baits, dead shrimp was definitely preferred and was used by over 91 percent of the anglers. Cut fish was the second most popular bait with 14 percent of the anglers using it. Bloodworms and earthworms were two other popular baits. Live bait (shrimp, minnows, and other small species of fish) were popular among 8 percent of the anglers. The anglers who used either cut fish or live bait were those who sought a particular species of fish. Anglers who sought no particular species of fish typically used dead shrimp.

SPECIES OF FISH SOUGHT

Over 71 percent of the pier anglers sought no particular "species" of fish. Those anglers who did pursue particular fish, generally were seeking more than one species each trip. Spot and kingfish were the two most sought after species with over 10 percent and 9 percent, respectively, of the anglers seeking them. Flounder, sea trout, and bluefish were three species that were also sought after regularly. A notable item is that over 3 percent of the anglers were fishing specifically for king mackerel and/or cobia. Many other species such as croaker, sheepshead, black drum, red drum, pompano and Spanish mackerel were also sought but at a much lower frequency.

Discussion

The pier fishing industry is a significant marine recreational activity in South Carolina. Approximately 25,000 people participated in this fishery during the eight months from April through November, 1974 and generated approximately 228,000 angler days of effort. Over 8,200 of these anglers came from other states specifically to enjoy the pier fishing opportunities in South Carolina. Pier anglers injected $2.4 million directly into the local business economy. Of this amount, $1.3 million can be directly attributed to the presence of the pier fishing industry.

This study showed definite socioeconomic patterns among the anglers in each of the three residency categories. The average out-of-state angler resided between 150 and 200 miles from the pier. He spent six nights in the area staying at a motel or campground. He averaged fishing 6.2 times from a pier annually, spending $69.21 during the stay. In-state anglers averaged spending four nights in the area of the piers, staying at either a motel or a campground and spending $41.97 during the visit. The in-state anglers fished an average of 18.5 times a year on South Carolina piers. Local pier anglers averaged fishing 68.7 times from piers in South Carolina annually while spending an average of $3.09 during each trip.

As a whole, pier anglers averaged staying five nights in the area and spent $46.37 during the stay. They averaged 19.7 fishing trips to the piers annually. Each angler spent 3.3 hours fishing and caught 4.1 fish per visit to the pier on the average.

Anglers utilizing South Carolina piers expended 746,612 man hours indulging in this sport. This fishery produced a projected 183,000 pounds of spot, croaker, and kingfish during the eight months of the survey. This poundage of fish amounted to 36 percent of the total

commercial landing for these three types of fish in South Carolina during 1974. These data document an added source of marine fish entering the American food market while giving an indication of the pressure applied by pier anglers to fish stocks in South Carolina.

The pier industry plays an important role in the state's recreational and tourism business. Not only does it attract large numbers of people to the northern coast of South Carolina, but it also offers an additional recreation outlet to those who come to the area for other reasons. The industry attracts fresh money from outside South Carolina, injecting it into the area's and state's economy with a much larger economic multiplier than another business, which deals with monies already within the area or state. Additionally, the aesthetic value derived by the participants in this sport is immensely important and even though it cannot be measured, it is a factor that cannot be overlooked.

Literature Cited

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