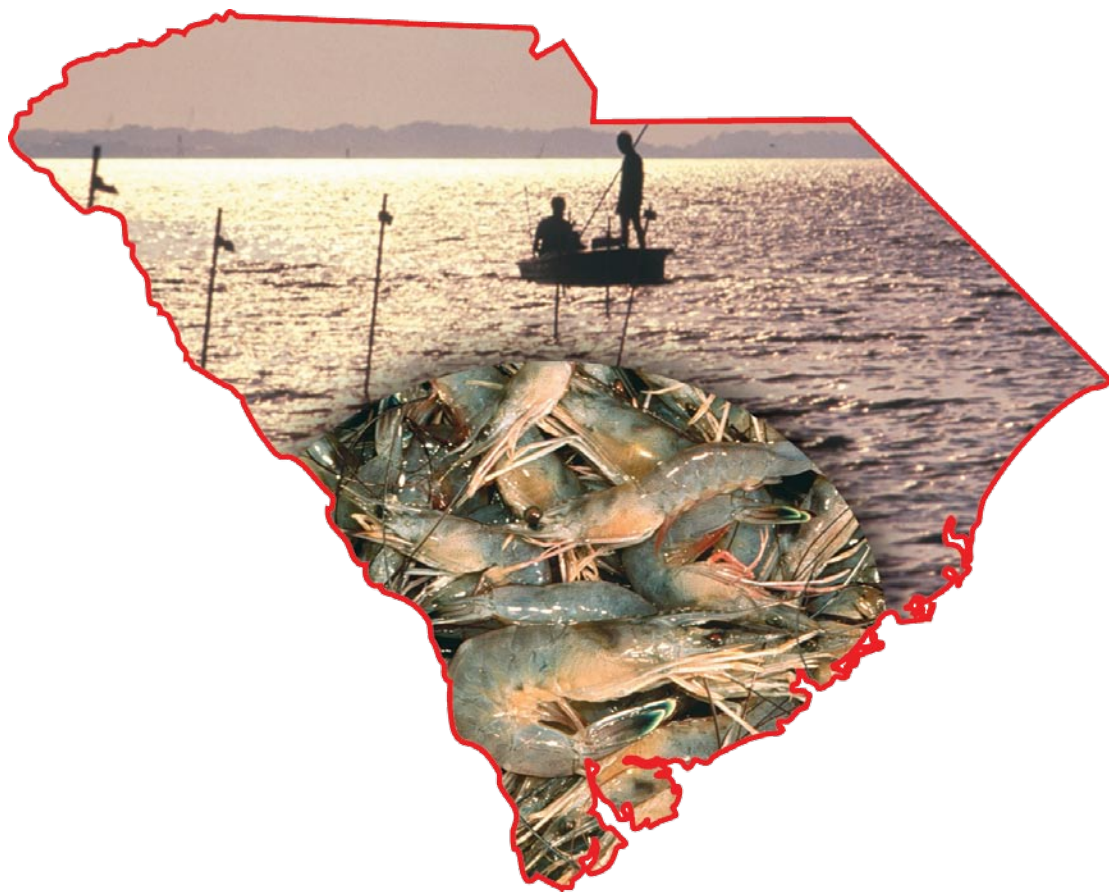


# Survey of the South Carolina Shrimp Baiting Fishery, 2005



**Data Report Number 40**  
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## INTRODUCTION

Theiling (1987) first described the history of shrimp baiting in South Carolina. Surveys have been conducted annually since 1987, using various approaches to address several objectives and issues. Approaches have included creel surveys, windshield surveys, and post-season mail surveys (Low 2002). These surveys have obtained statistics on participation, effort, and catch for each season, in addition to information on demographics of participants and constituency opinions on management options, user groups, and economic issues.

Data for the 2005 shrimp baiting season were obtained from a post-season mail out survey. The objectives were to estimate the total participation (the number of active permit holders and their assistants), total effort in numbers of trips, total catch, and effort and catch by shrimping area and residence category.

## METHODS

The post-season mailing was similar to those of previous years. The survey package consisted of an introductory statement and a pre-addressed business reply postcard questionnaire (Figure 1). The package was sent by first class mail to 44% of the individuals who purchased a shrimp baiting permit in 2005. The sample was randomly selected and stratified in direct proportion to the percentage of permit holders residing in each county. A one-month return period was specified in order to minimize problems associated with recall and provide an adequate sample size for the analysis. Any responses received after the one month period were not included in the analysis. An additional survey conducted by the University of South Carolina's School of Public Health was also included in 400 (10%) of the survey packages. USC is conducting research on human health and seafood consumption and used this survey to collect information on local seafood consumption rates, preparation techniques, and preference of species consumed. (Results from the USC survey can be seen in Appendix 1.)

1. What <b>County</b> do you live in? _____		
2. How many <b>Trips</b> did you make using <b>YOUR</b> permit and gear? <input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> All Season		
3. Please indicate the number of <b>Trips</b> you made in each <b>Area</b> . <i>(Refer to map on cover letter)</i>		
<input type="checkbox"/> Beaufort	<input type="checkbox"/> Charleston	<input type="checkbox"/> St. Helena Sd.
<input type="checkbox"/> Bulls Bay	<input type="checkbox"/> Wadmalaw/Edisto Is.	<input type="checkbox"/> Georgetown
4. How many <b>Different People</b> assisted you on your boat? _____		
5. What was your <b>Average Catch Per Trip</b> in quarts of whole shrimp? _____		
6. What was your <b>Total Catch</b> for the season? _____ quarts of whole shrimp		
7. Approximately how many years have you had a shrimp baiting permit?		
<input type="checkbox"/> 1 – 2 years	<input type="checkbox"/> 6 - 10 years	<input type="checkbox"/> greater than 15 years
<input type="checkbox"/> 3 – 5 years	<input type="checkbox"/> 11 – 15 years	

Figure 1. Post-season mail questionnaire.

## RESULTS

The effective mailout (after subtraction of non-deliverables) was 3,962 with a return rate (usable responses) of 31% (N = 1220). Usable responses were determined by specific criteria including, date of return, identification of residence county, accuracy in reported catch, and means of shrimping (i.e. off boat or dock). Thirteen respondents indicated they did not use a boat or shrimped from their dock. These responses were not included in the analysis and represented only 1% of the respondent population. Catch rates from docks averaged approximately 1 quart per night (range = 1 – 6 quarts per night).

Distributions of the permit holder populations by county of residence in the first year of permit sales, the average of the last three years, and in the current year are shown in Table 1. The distributions of the 2005 permit holder population and survey population are compared in Table 2. As has been generally the case, the return rates from non-coastal residents (~34.06%) were slightly higher than coastal residents (~28.36%). However, the overall distribution of the sample group was comparable to that of the total population and therefore was sufficiently representative of the overall shrimp baiting population.

## Participation

About 25% of respondents indicated that they had made no trips using their gear and tags. The percent of active permit holders was one of the lowest on record, showing only a slight increase (2% increase) from 2004's all time low of 73%. The estimated number of active permit holders (Table 3) was obtained by

Table 1. Distributions of permit holder populations, in percentages of permit holders by county.

County	1988	2002 - 2004	2005
Abbeville	0.10	0.37	0.38
Aiken	2.00	4.00	4.04
Allendale	1.20	0.61	0.59
Anderson	0.20	0.78	0.84
Bamberg	1.50	1.09	0.96
Barnwell	1.30	1.71	1.45
Beaufort	10.30	11.41	12.44
Berkeley	9.40	7.26	7.03
Calhoun	0.40	1.11	0.91
Charleston	41.20	20.94	21.76
Cherokee	<0.1	0.11	0.12
Chester	<0.1	0.16	0.14
Chesterfield	<0.1	0.13	0.13
Clarendon	0.10	0.82	0.79
Colleton	5.00	4.04	3.83
Darlington	0.10	0.85	0.80
Dillon	0.00	0.35	0.39
Dorchester	6.90	4.66	4.48
Edgefield	<0.1	0.51	0.52
Fairfield	0.10	0.40	0.34
Florence	0.20	2.28	2.33
Georgetown	2.40	5.29	4.82
Greenville	0.20	1.44	1.54
Greenwood	0.10	0.67	0.64
Hampton	4.00	2.60	2.60
Horry	0.30	3.66	3.76
Jasper	3.40	1.74	1.71
Kershaw	0.10	0.74	0.67
Lancaster	0.00	0.31	0.33
Laurens	0.10	0.49	0.62
Lee	0.00	0.11	0.07
Lexington	2.50	5.91	5.54
Marion	0.10	0.28	0.23
Marlboro	<0.1	0.03	0.06
McCormick	<0.1	0.15	0.16
Newberry	0.20	0.73	0.70
Oconee	<0.1	0.43	0.46
Orangeburg	4.00	3.43	2.74
Pickens	<0.1	0.44	0.40
Richland	1.40	3.41	3.69
Saluda	<0.1	0.39	0.43
Spartanburg	0.10	1.01	1.31
Sumter	0.30	1.12	1.17
Union	0.10	0.12	0.09
Williamsburg	0.40	0.85	0.78
York	0.10	0.97	1.08
AL			0.02
FL		0.01	
GA		0.05	0.07
NC		0.01	0.01
TN			0.01
WI		0.01	0.01
Total Out of State	N/A	0.08	0.12
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

multiplying the number of permits issued in each residence category by the percentage of positive responses received per region. Assistants were the numbers of different individuals who accompanied active permit holders. Although some individuals were probably counted by more than one permit holder, the extent of such duplication was assumed to be negligible. The average number of assistants per permit holder (2.07 overall) in each residence category was multiplied by the estimated number of permit holders to obtain the estimated total numbers of assistants (14,000). The total number of participants is the sum of the active permit holders and their assistants.

## Effort

The overall seasonal effort was 4.9 trips per active permittee. The average numbers of season trips per active permit holder were obtained by summing the number of trips reported in each residence category and dividing these figures by the numbers of respondents who reported trips. These means were then multiplied by the estimated numbers of active permit holders in the overall populations to obtain estimates of seasonal effort by residence category (Table 4). The estimated numbers of trips per month were calculated by multiplying these season totals by the appropriate percentages of trips in each month. These were determined from the data provided by respondents who broke their seasonal effort down into complete monthly components (N = 839, 91.7% of active permittees). The estimated effort numbers in the Total column (Table 4) were generated by adding these categorical figures. The distribution of seasonal effort by residential region is shown in Table 5.

The coastal area was divided into six geographical areas as described below (Figure 2):

- Beaufort – From the Savannah River to the south end of St. Helena Island, including the Beaufort River
- St. Helena Sound – From the south end of St. Helena Island to the South Edisto River and southern end of Edisto Island
- Wadmalaw/Edisto Islands – From the South Edisto River to the Stono River, including Edisto, Wadmalaw, Seabrook, Kiawah, and Johns Island

Table 2. Distribution of 2005 shrimp baiting permittees by residential category.

Region	Total Population (N)	%	Sample Population (N)	%	Respondent Population (N)	%
<b>North Coastal</b>						
Georgetown	434		205	5.13	65	5.33
Horry	339		138	3.45	45	3.69
Total	773	8.59	343	8.58	110	9.02
<b>Central Coastal</b>						
Berkeley	633		280	7.00	71	5.82
Charleston	1959		859	21.48	239	19.59
Dorchester	403		189	4.73	63	5.16
Total	2995	33.26	1328	33.21	373	30.57
<b>South Coastal</b>						
Beaufort	1120		499	12.48	149	12.21
Colleton	345		175	4.38	44	3.61
Hampton	234		90	2.25	18	1.48
Jasper	154		58	1.45	13	1.07
Total	1853	20.58	822	20.56	224	18.36
<b>Central Inland</b>						
Aiken	364		154	3.85	44	3.61
Allendale	53		21	0.53	3	0.25
Bamberg	86		49	1.23	12	0.98
Barnwell	131		58	1.45	14	1.15
Lexington	499		225	5.63	87	7.13
Orangeburg	247		102	2.55	33	2.70
Richland	332		150	3.75	55	4.51
Total	1712	19.01	759	18.98	248	20.33
<b>Other Counties</b>	1660	18.44	736	18.40	262	21.48
<b>Out of State</b>	11	0.12	11	0.28	3	0.25
<b>Total</b>	9004		3999		1220	

Table 3. Estimated participation by residential category.

	North Coast	Central Coast	South Coast	Central Inland	Other Counties	Out of State	Total
Permits issued	773	2995	1853	1712	1660	11	9004
Percent active permits	80.9	76.9	67.9	79.0	72.1	66.7	75.0
Number of active permits	625	2304	1257	1353	1197	7	6753
Average number of assistants	1.98	2.07	1.97	2.05	2.24	2.50	2.07
Total number of assistants	1237	4761	2473	2768	2680	18	14000
Total number of participants	1862	7066	3731	4121	3878	26	20753
<b>Percent of Total</b>	9.0	34.0	18.0	19.9	18.7	0.1	100

- Charleston – From the Stono River to the north end of Isle of Palms
- Bulls Bay – From the north end of the Isle of Palms to the southern boundary of Georgetown County, near the Santee River
- Georgetown – Georgetown and Horry Counties, including Winyah Bay

The distribution of estimated effort in each area is indicated in Table 6. These figures were obtained by multiplying the total numbers of trips in each residence category by the percentages of effort reported in each area. These percentages were determined by summing all trips reported by area within each residence category, then dividing the numbers associated with each area by these sums.



Table 4. Estimated number of trips by residential category.

	North Coast	Central Coast	South Coast	Central Inland	Other Counties	Out of State	Total
Average Trips/Active Permit Holder	4.31	4.99	5.50	4.22	3.61	15.50	4.90
Percentage By Month							
September	0.359	0.308	0.335	0.321	0.390	0.452	0.335
October	0.467	0.471	0.472	0.469	0.430	0.484	0.464
November	0.174	0.221	0.193	0.208	0.180	0.065	0.201
Estimated Trips per Month							
September	967	3541	2319	1833	1686	51	10397
October	1259	5414	3262	2675	1856	55	14520
November	469	2543	1336	1185	779	7	6320
<b>Total</b>	2695	11498	6918	5708	4320	114	31238
<b>Percentage of Total</b>	8.6	36.8	22.1	18.3	13.8	0.4	100

Table 5. Distribution of seasonal effort in percentage of respondents by residential category.

Residential Region	Trips/permit holder/season				
	1 - 4	5 - 10	11 - 15	16 - 20	> 20
North Coast	68	28	2	0	1
Central Coast	56	35	6	2	2
South Coast	66	24	4	3	3
Central Inland	67	26	5	1	2
Other SC Counties	76	20	3	1	1
Out of State	0	0	50	50	0
Statewide	65	27	4	1	2

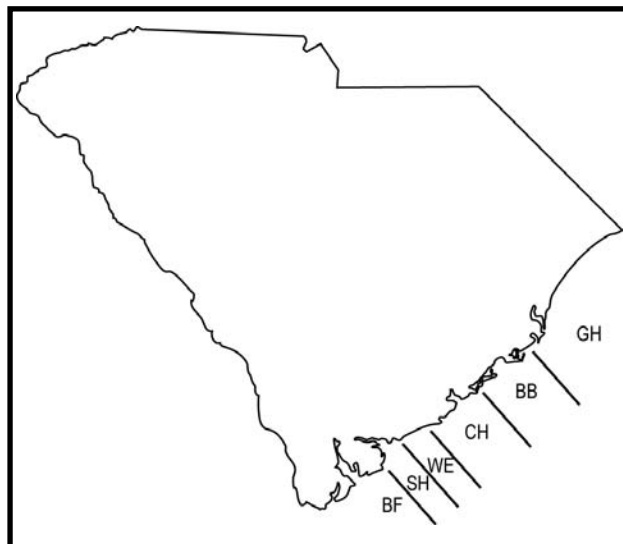


Figure 2. Shrimp baiting areas.

Table 6. Estimated number of trips by shrimping area.

Residence Category	Beaufort	St. Helena	Wadmalaw/Edisto	Charleston	Bulls Bay	Georgetown	Total
North Coast	35	21	0	28	2250	361	2695
Central Coast	144	353	1058	6923	3013	8	11498
South Coast	5433	1369	75	33	8	0	6918
Central Inland	2571	1565	655	476	407	34	5708
Other Counties	1136	1109	235	313	1240	287	4320
Out of State	0	40	73	0	0	0	114
<b>Total</b>	9319	4457	2095	7773	6918	691	31253
<b>Percentage of Total</b>	29.8	14.3	6.7	24.9	22.1	2.2	100

### Catch Rates

Average seasonal catch rates are listed in Table 7. These were obtained by adding the reported catch per unit of effort (CPUE, in quarts of whole shrimp per trip) in each residential category and dividing by the numbers of observations. Comparisons were made between reported CPUE and calculated CPUE (dividing the total reported catch by the total number of trips for each active respondent). No significant differences were seen between the reported and calculated CPUEs. Reported CPUE's were used for all subsequent calculations. The CPUEs by shrimping area (Table 8) were calculated by summing the season CPUEs for each area and dividing these figures by the corresponding numbers of observations. Only the data from respondents who limited their activity to one area were included (N = 751, 82% of active permittees), since there was no way to separate catch and effort by area for respondents who shrimped in more than one area.

Table 7. CPUE (quarts of whole shrimp per trip) by residential category.

Region	CPUE
North Coast	25.30
Central Coast	21.90
South Coast	22.60
Central Inland	23.90
Other SC Counties	24.66
Out of State	16.50
<b>Total</b>	<b>23.33</b>

Table 8. CPUE (quarts of whole shrimp/trip) by shrimping area.

Shrimping Location	Estimate CPUE
Beaufort	24.90
St Helena	22.56
Wadmalaw/Edisto	16.96
Charleston	21.84
Bulls Bay	24.71
Georgetown	19.50

Because the residential stratification of the sample population was similar to that of the total permit holder population, an unbiased estimate of the average statewide CPUE can be obtained by calculating

the mean of the CPUEs reported by the respondents. This value was 23.33 quarts of whole shrimp per trip.

### Catch

The average seasonal catches (quarts of whole shrimp) reported by respondents were as follows for residential regions:

Residential Region	Average Seasonal Catch
North Coast	109.03 quarts of whole shrimp
Central Coast	109.28 quarts of whole shrimp
South Coast	124.33 quarts of whole shrimp
Central Inland	100.66 quarts of whole shrimp
Other SC Counties	88.93 quarts of whole shrimp
Out of State	255.75 quarts of whole shrimp
<b>Overall</b>	<b>108.78 quarts of whole shrimp</b>

There are numerous ways to estimate the total catch, depending on the interest in its relative components. The simplest method is to multiply the statewide average CPUE by the estimated number of total trips:

#### Catch Estimate 1

$$23.33 \text{ statewide quarts per trip} \times 31,238 \text{ total trips} = 728,921 \text{ quarts whole shrimp}$$

Similarly, the total number of active permit holders can be multiplied by the statewide average seasonal catch per respondent:

#### Catch Estimate 2

$$114.38 \text{ statewide seasonal catch} \times 6,753 \text{ estimated active permittees} = 772,422 \text{ quarts whole shrimp}$$

An estimate can be derived from the average catch data above by multiplying them by the appropriate numbers of active shrimpers. This method produced the following estimates:

**Catch Estimate 3**

Residential Region	Average Seasonal Catch	Average Active Permittees	Catch Estimate
North Coast	109.03	625.43	68,191.70
Central Coast	109.28	2,304.46	251,839.95
South Coast	124.33	1,257.39	156,335.68
Central Inland	100.66	1,353.03	136,193.57
Other SC Counties	88.95	1,197.48	106,519.50
Out of State	255.75	7.33	1,875.50
			<b>720,956 quarts whole shrimp</b>

Catches by residence category were also estimated by multiplying the estimated effort for each by the appropriate CPUE. This approach generated the following results:

**Catch Estimate 4**

Residential Region	Total Estimated Trips	Average CPUE	Catch Estimate
North Coast	2,694.96	25.30	68,191.70
Central Coast	11,498.26	21.90	251,839.95
South Coast	6,917.91	22.60	156,335.68
Central Inland	5,707.93	23.90	136,437.01
Other SC Counties	4,320.21	24.66	106,519.50
Out of State	113.67	16.50	1,875.50
			<b>721,199 quarts whole shrimp</b>

Catches by shrimping area were obtained by multiplying the estimated effort in each by the corresponding average estimated CPUE.

**Catch Estimate 5**

Shrimping Area	Total Estimated Trips	Average Estimated CPUE	Catch Estimate
Beaufort	9,318.94	24.90	232,075.78
St. Helena Sound	4,456.66	22.56	100,531.14
Wadmalaw/Edisto	2,095.50	16.96	35,549.94
Charleston	7,772.87	21.84	169,761.23
Bulls Bay	6,918.18	24.71	170,954.03
Georgetown	690.81	19.5	13,470.71
			<b>722,343 quarts whole shrimp</b>

There are trade-offs in probable accuracy and lack of bias associated with each approach and an intermediate value is a reasonable overall estimate. The average of the five estimates shown above is **733,186 quarts whole shrimp**. The conversion factor from quarts to pounds (whole weight) is 1.48. The weight equivalent of whole shrimp is **1,085,089 pounds**.

To convert whole weight to heads-off weight, whole weight is divided by 1.54, giving an estimate of **704,603 pounds heads-off**.

The distribution of season catches by residence category is shown in Table 9. A conservative estimate of the statewide average catch per active permit

holder, based on the respondents' estimates of their season catches, was 108.78 quarts whole shrimp (161 pounds whole shrimp). Assuming equal shares for permit holders and their assistants, the average yield per participant was about 35.14 quarts whole shrimp (52 pounds whole shrimp).

Table 9. Distribution of season catches (quarts of whole shrimp) in percentages of respondents by residential category.

Residential Region	Trips/permit holder/season					
	<99	100-199	200-299	300-399	400-499	>500
North Coast	64	19	13	1	1	1
Central Coast	59	21	11	4	2	3
South Coast	59	22	9	3	4	3
Central Inland	66	15	10	4	2	2
Other SC						
Counties	65	24	5	2	2	2
Out of State	50	0	0	0	0	50
Statewide	62	20	10	3	2	3

The competition between commercial and recreational interests of the fall white shrimp harvest is perceived as an allocation issue. Since 1992, a monitoring system for commercial landings has been in place that permits comparison of recreational and commercial landings for comparable area/time units. The baiting areas and corresponding commercial statistical zones are as follows:

Baiting Area	Commercial Zone
Beaufort (rivers and sound)	Hilton Head to Bay Point
St. Helena Sound	Bay Point to South Edisto River
Wadmalaw/Edisto Islands	South Edisto River to Stono Inlet
Charleston (rivers and harbor)	Stono Inlet to Dewees Inlet
Bulls Bay	Dewees Inlet to Cape Romain
Georgetown (rivers and bay)	Cape Romain to NC Line including Winyah and Santee Bays

The comparison of baiting and commercial landings is shown in Table 10. In-season commercial landings were defined as those from September 9, 2005 through November 8, 2005. Total commercial landings included those from August 1, 2005 through the closure of the 2005 season (January 21, 2006). Combined total recreational and commercial landings are the baiting catch plus the total commercial landings as so defined. All 2005 commercial landings data are preliminary and may be subject to slight changes with time.

Table 10. Estimated shrimp baiting catches and reported commercial landings (wild-caught, all gears) by area, in thousands of pounds whole shrimp.

Shrimping Area	Commercial		Percent baiting	
	In-season	Total	In-season	Total
Beaufort	35,106	42,349	91	89
St. Helena	267,995	415,275	36	26
Wadmalaw/Edisto	350,553	448,982	13	10
Charleston	136,678	225,882	65	53
Bulls Bay	387,518	622,108	40	29
Georgetown	324,845	649,399	6	3
<b>Total</b>	<b>1,502,694</b>	<b>2,403,994</b>	<b>42</b>	<b>31</b>

Comparisons between areas are influenced by factors, such as the relative sizes of recreational population and trawler fleet, proximity of population centers and trawler docks, accessibility of inland waters, and extent of inland waters versus trawlable coastal waters.

### Experience in Fishery

The majority of survey respondents have participated in the baiting fishery between six and ten years with the most experienced permittees residing on the central coast followed by counties on the southern coast and central inland (Table 11). Respondents new to the fishery resided primarily on the central coast and in other non-coastal counties (excluding the central inland counties).

Experience seemed to influence shrimping success (at least for a number of years) with the highest catch rates seen in those participants who have been in the fishery the longest (Table 12). However, as one would expect, participation only seemed to influence success up to a certain point in the fishery (i.e. law of diminishing returns), as is seen in the data.

Table 11. Shrimp baiting experience of survey respondents by residential category. Percent of grand total in parentheses.

Years of Baiting Experience	North Coast	Central Coast	South Coast	Central Inland	Other SC Counties	Out of State
1-2	14 (1.2)	63 (5.2)	35 (2.9)	30 (2.5)	53 (4.4)	0 (0.0)
3-5	30 (2.5)	78 (6.4)	51 (4.2)	53 (4.4)	78 (6.4)	1 (0.1)
6-10	34 (2.8)	103 (8.5)	52 (4.3)	73 (6.0)	73 (6.0)	0 (0.0)
11-15	18 (1.5)	63 (5.2)	37 (3.1)	48 (4.0)	34 (2.8)	0 (0.0)
>15	14 (1.2)	65 (5.4)	47 (3.9)	41 (3.4)	21 (1.7)	2 (0.2)
<b>Total by Region</b>	110 (9.1)	372 (30.7)	222 (18.3)	245 (20.2)	259 (21.4)	3 (0.2)

Table 12. Shrimp baiting experience and corresponding average CPUE for overall respondent population.

Years of Baiting Experience	Number of Permittees	Percent of Permittees	Average CPUE
1-2	195	16.1	18.1
3-5	291	24.0	21.2
6-10	335	27.7	25.5
11-15	200	16.5	26.7
>15	190	15.7	24.5

## DISCUSSION

Documentation of seasonal statistics began in 1987 (Theiling). Table 13 summarizes the data for each year's fishery.

The number of shrimp baiting permit holders has been declining since 1998. 2005 marked the lowest permit sales since 1988 and 1989, the first two years the permit was in place, with only 9,004 permits. Sales were 48% percent below the peak level obtained in 1998 and 37% below the 10 year average (1994-2004). Preseason forecasts of shrimp were good. However, the low price of shrimp may have encouraged the purchase of commercial shrimp, and the high price of gasoline due to Hurricanes Katrina and Rita may have contributed to the low sales.

The 2005 baiting season opened with the threat of Hurricane Ophelia and heavy rainfall occurred in mid-October due to Tropical Storm Tammy. However, overall weather during the baiting season was fair with few nights affected by rain and wind. Although weather was favorable for most of the season, the percentage of active permit holders increased only slightly from 2004 and was still one of the lowest on record with the number of active individuals 8.5 %

below the 10 year average (1994-2004). The average number of assistants per active permit holder was higher than that seen the past three years and nearly matched the 10 year average of 2.1. A slight rise was seen in the number of participants, due primarily to the increase in assistants. However, participation was still substantially lower than it has been over the past fifteen years.

Average individual effort barely exceeded the lowest previously reported in 2000 at 4.9 trips per active permittee. Statewide effort was the lowest recorded to date, eclipsing even 1989 when Hurricane Hugo basically eliminated the fishery from Charleston north. Effort decreased along almost the entire coast with the largest declines reported in the Wadmalaw/Edisto Islands and Beaufort areas. Georgetown was the only area that saw an increase in fishing effort. However, even with this increase in effort, Georgetown only accounted for 2% of the total estimated trips.

Although effort was at an all time low in 2005, the statewide CPUE was the highest it has been since 1997, exceeding the 10 year average by 13%. Catch rates were highest in the Beaufort and Bulls Bay areas. However, Georgetown and Charleston saw the largest increases in catch rates from 2004. Distribution of effort appeared to be influenced by shrimping success with Beaufort and Bulls Bay accounting for over 51% of the 2005 effort. An exception to this pattern was seen in St. Helena Sound where catch rates were similar to Beaufort and Bulls Bay; however this only comprised 14% of the total estimated effort. The lowest catch rates were found in the Wadmalaw/Edisto Islands area, which may have influenced the large drop in effort in this area.

In 2005 the total fall harvest (recreational and commercial) was about 2.3 million pounds heads-off

Table 13. Seasonal comparisons of shrimp baiting participation, effort, and catch parameters.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Permits issued	NA	5,509	6,644	9,703	12,005	11,571	12,984	13,366	13,919	14,156
Percent active permits	NA	92	82	94	89	87	91	86	89	85
Assistants/permit holder	NA	2.5	2.14	2.79	2.24	2.15	2.43	2.32	2.39	2.25
Participants	21,735	17,749	17,171	34,662	34,821	31,812	40,620	38,081	41,971	38,932
Trips/permit holder	NA	7	5.7	7.8	6.6	6.1	6.8	6	6.5	6.6
Total Trips	40,101	35,609	31,624	71,153	71,034	62,459	80,709	70,429	81,632	68,927
Average quarts/trip	28.5	22.1	26.5	25.6	21.3	25.4	23.5	18.5	28.9	16.9
Whole pounds (millions)	1.8	1.16	1.25	2.75	2.14	2.35	2.72	1.91	3.4	1.73
Pounds/participant	83	65	73	79	62	74	67	50	81	44
Share of Total Harvest	29	32	24	46	29	39	44	34	33	35
	1997	1998	1999	2000	2001	2002	2003	2004	2005	
Permits issued	15,488	17,497	15,895	15,929	13,698	13,903	12,445	10,609	9,004	
Percent active permits	91	87	81	81	87	78	81	73	75	
Assistants/permit holder	2.44	2.31	2.09	1.93	2.18	1.96	1.76	1.5	2.07	
Participants	48,544	50,436	39,514	37,622	37,699	32,038	28,028	19,668	20,753	
Trips/permit holder	6.6	6	5.1	4.8	5.8	5	5.8	5.2	4.9	
Total Trips	94,154	92,484	66,396	61,445	69,847	54,610	58,533	39,893	31,238	
Average quarts/trip	26.4	21.7	21.1	10.2	20.3	14.2	21.8	17	23.33	
Whole pounds (millions)	3.63	2.91	2.02	0.91	2.09	1.11	1.87	0.991	1.09	
Pounds/participant	72	58	46	23	53	35	67	50	52	
Share of Total Harvest	43	41	31	24	47	31	47	27	23	

(~3.5 million pounds heads-on), which is one of the lowest harvests in the last decade despite a fairly mild winter. Baiters comprised 31% of the total harvest and 42% of the in-season harvest. This is 5 % higher than the contribution by baiters to the total fall harvest last year and is slightly under the 10 year average (1994-2004) of 36%. The Beaufort and Charleston areas contributed most to this harvest with baiting accounting for 89% of the total harvest in Beaufort and 53% of the total harvest in Charleston. The baiters share was below the ten-year average in the Wadmalaw/Edisto Islands, Bulls Bay, and Georgetown areas, but above it in the Beaufort and St. Helena Sound areas. In the Charleston area, the baiters' share was near the long term average.

Approximately 1.5 million pounds heads-off of the fall harvest was attributed to commercial trawlers, which is well below the ten year average of 2.5 million pounds heads-off. This may potentially be credited to the substantial decrease in effort by commercial shrimpers over the past few years (Figure 3). Although no distinct pattern can currently be detected, the gap between the fall commercial and baiter harvest may narrow if effort continues to decline in the commercial fishery (Figure 4). If this occurs, one could speculate baiters may more adequately reflect the state of the resource because historically their effort has remained more constant, although in recent years effort among baiters has also decreased.

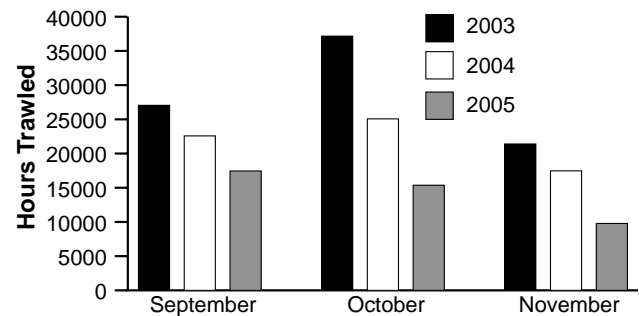


Figure 3. Commercial trawler fall effort 2003 - 2005.

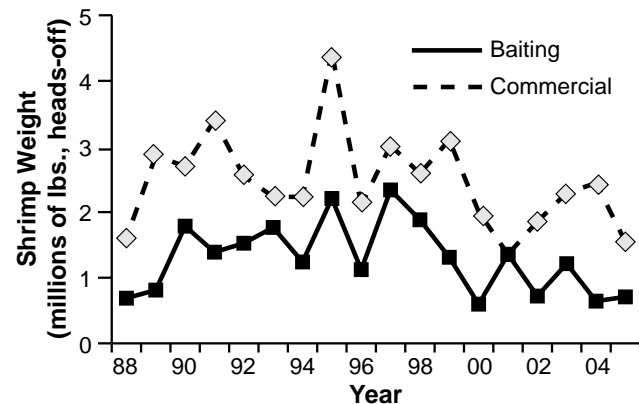



Figure 4. Comparison of estimated shrimp baiting catches and reported commercial landings (all gears, wild-caught) from 1988 to 2005.

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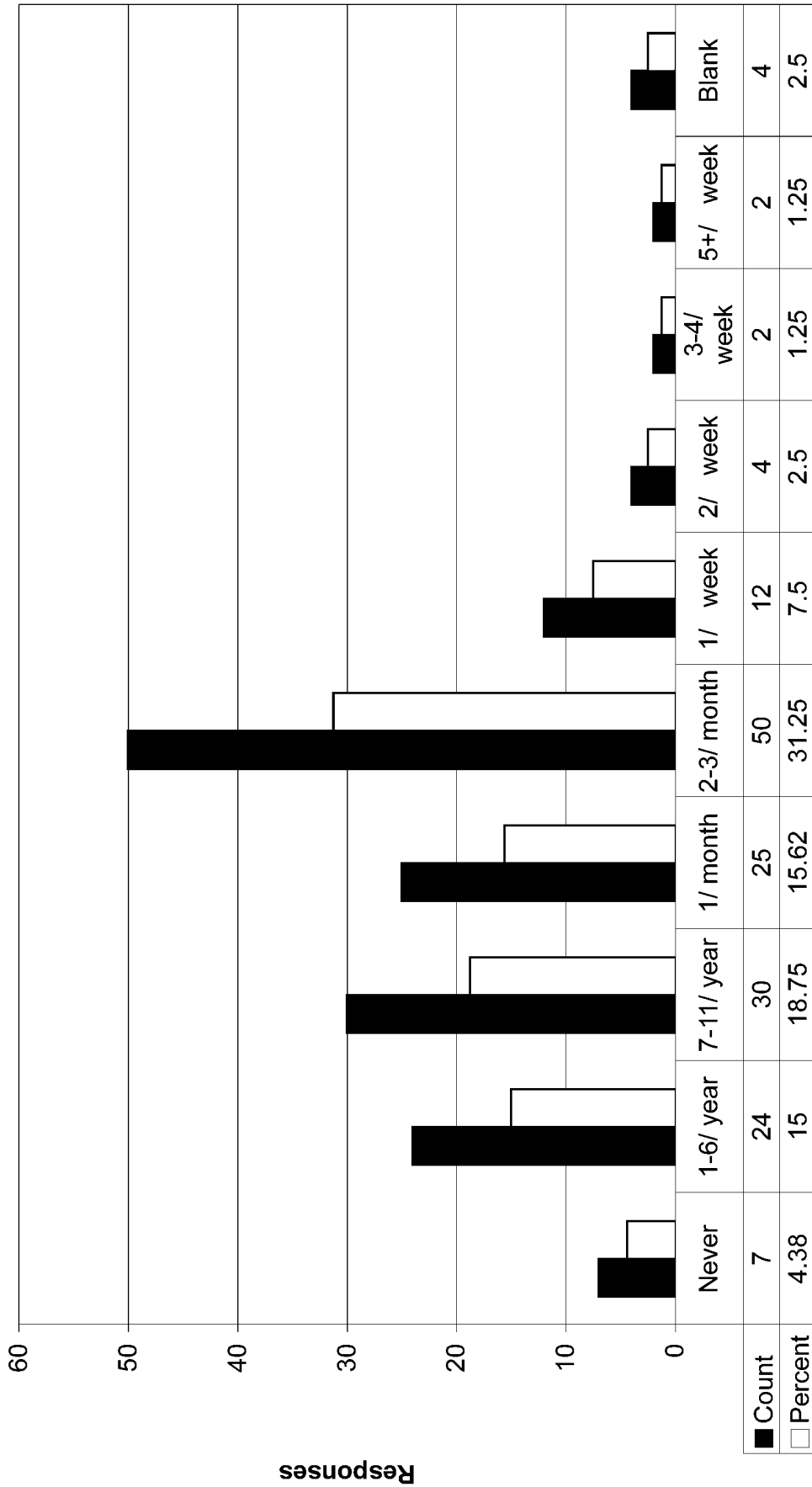
## APPENDIX 1

University of South Carolina's School of Public Health survey questionnaire and results.

 UNIVERSITY OF SOUTH CAROLINA	<p>This survey is being conducted by the <b>University of South Carolina's School of Public Health</b>. We want to find out more on human health and seafood. <b>Your answers to the following questions are very important to us.</b> Participation in this survey is voluntary. For further information contact: 843-762-8645. <i>Please circle your answer.</i></p>
<p>1. In the last 12 months, how often did you eat shrimp you <b>caught locally</b>? (Please include shrimp caught by yourself, family, and friends)</p>	
<p>Never 1-6/year 7-11/year 1/month 2-3/month 1/week 2/week 3-4/week 5+/week</p>	
<p>2. How much shrimp do you <b>usually</b> eat at one meal?</p>	
<p>¼ pound (4 oz) ½ pound (8 oz) ¾ pound (12 oz) 1 pound (16 oz)</p>	
<p>3. How do you <b>typically</b> prepare the shrimp you eat?</p>	
<p>Whole Body only with vein intact Body only with vein removed</p>	
<p>4. In the last 12 months, what was the <b>most common</b> location and body of water you caught your shrimp? _____</p>	
<p>5. In the last 12 months, what other <b>locally caught</b> seafood did you eat? <b>CIRCLE ALL</b></p>	
<p>Blue Crab Dolphin (Mahi Mahi) Hard Clam (quahog) King Mackerel Oysters Red Drum</p>	
<p>Scamp Grouper Shark (What _____) Sheepshead Snapper Tuna Wreckfish</p>	
<p>Southern Flounder Spanish Mackerel Spotted Sea Trout Stripped Mullet Summer Flounder</p>	
<p>Swordfish Triggerfish Other: _____</p>	
<p>6. What is your gender (Male or Female) and your age (18-25 26-30 31-35 36-40 41-45 46-50 51-55 55+)?</p>	
<p>30322/11/05</p>	



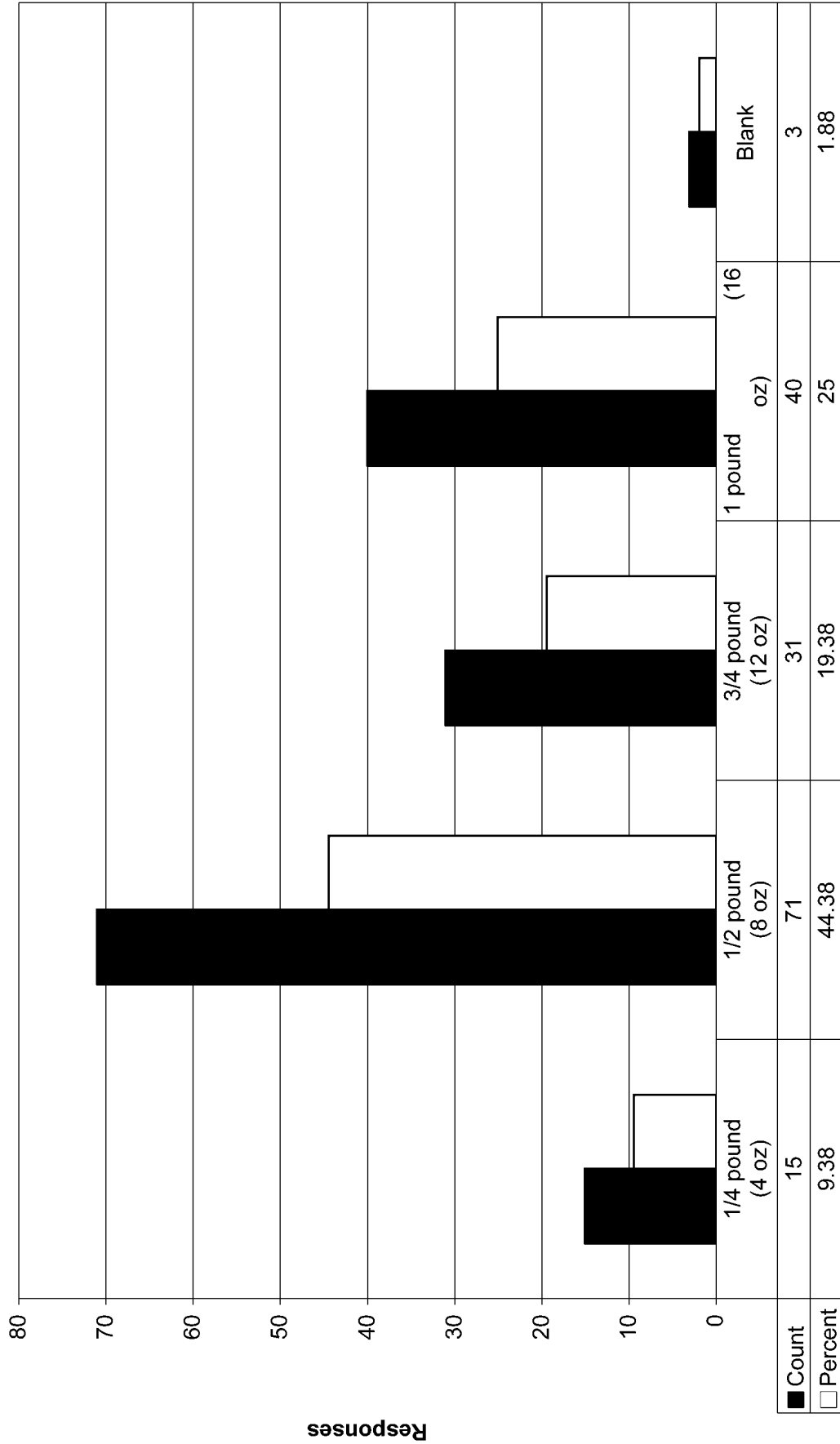
**In the last 12 months,  
how often did you eat shrimp you caught locally?**  
SCDNR Distributed Responses Only (n=160)



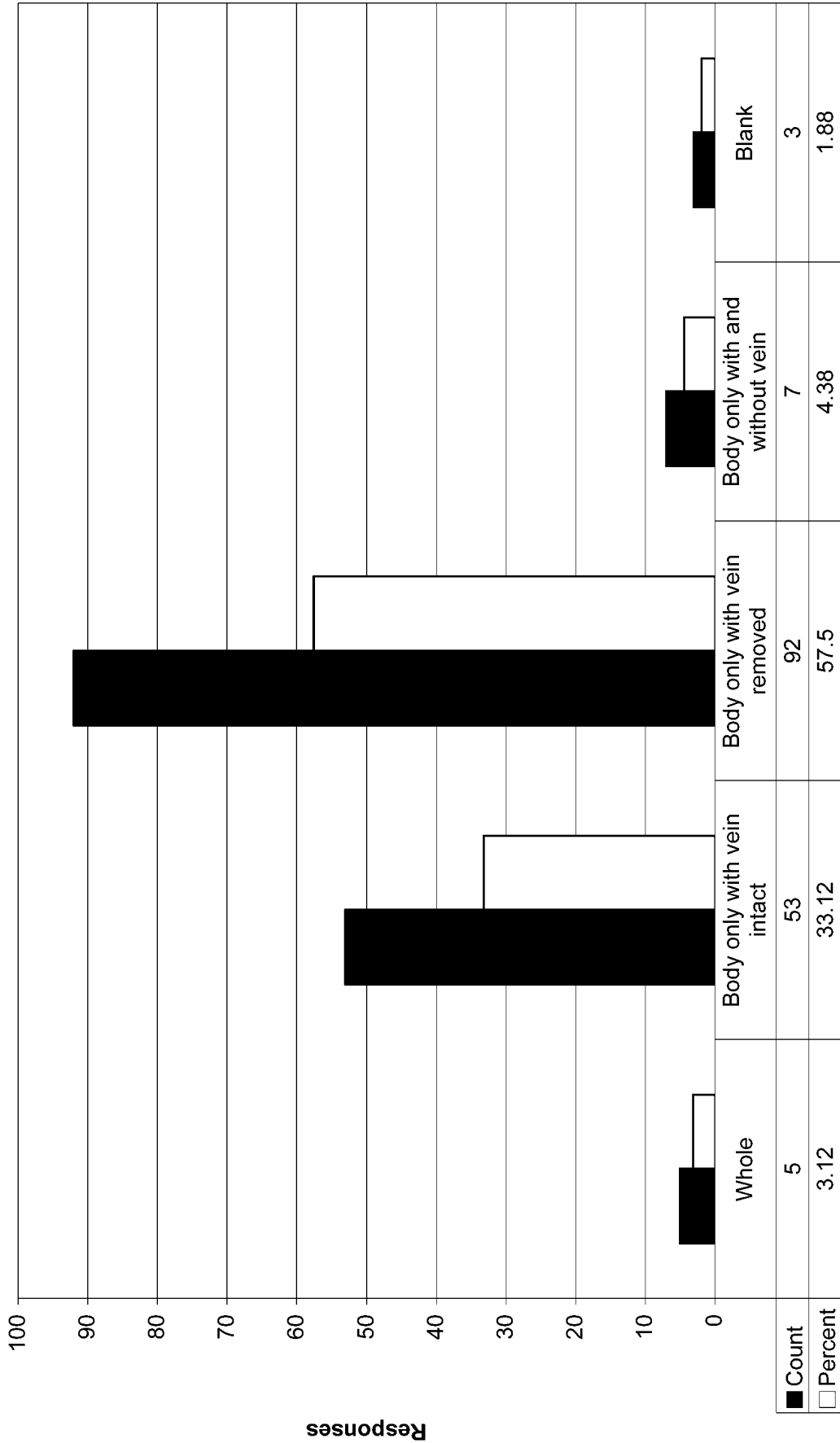
Frequency Ate

**How much shrimp do you usually eat at one meal?**

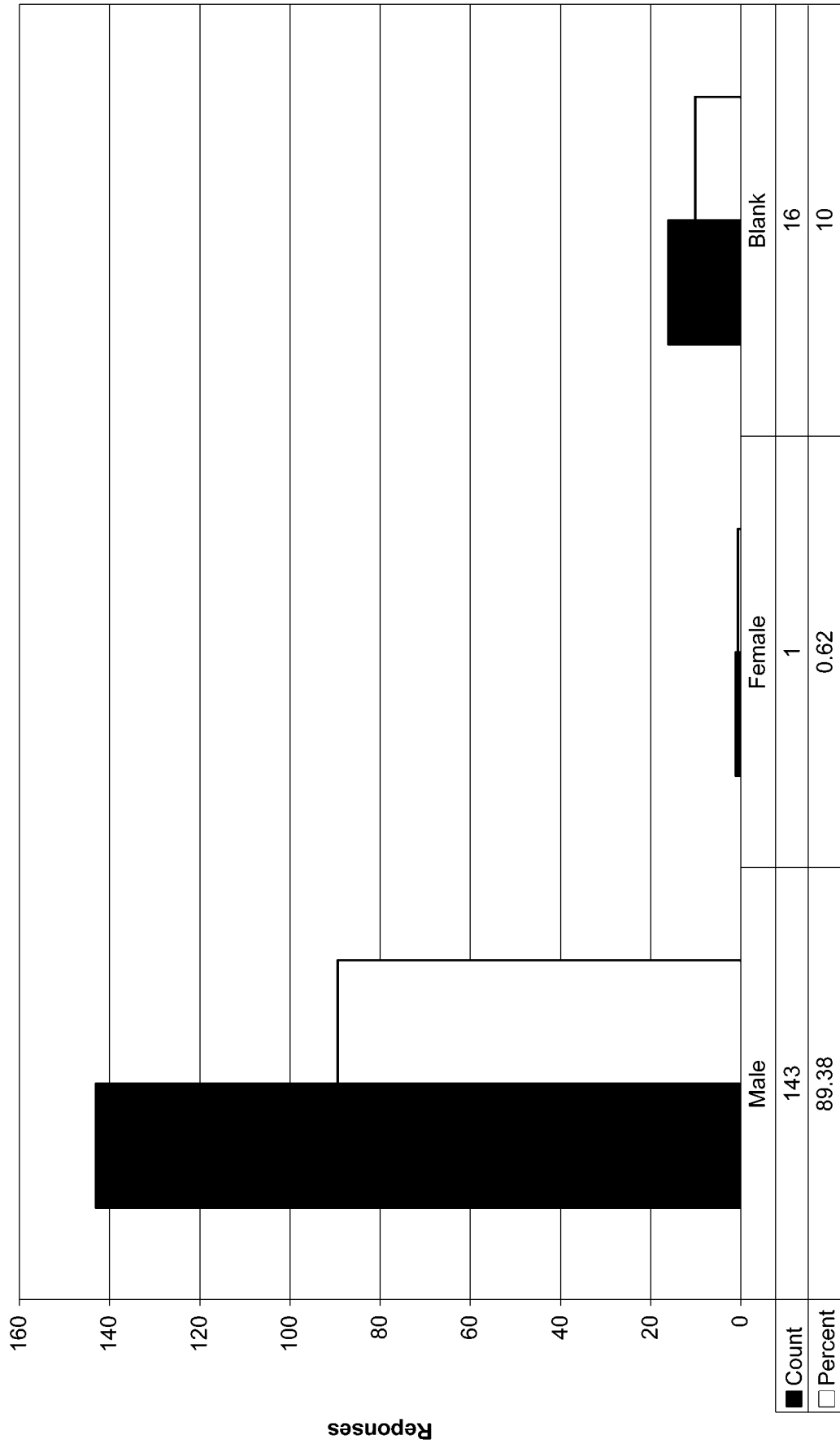
SCDNR Responses Only (n=160)



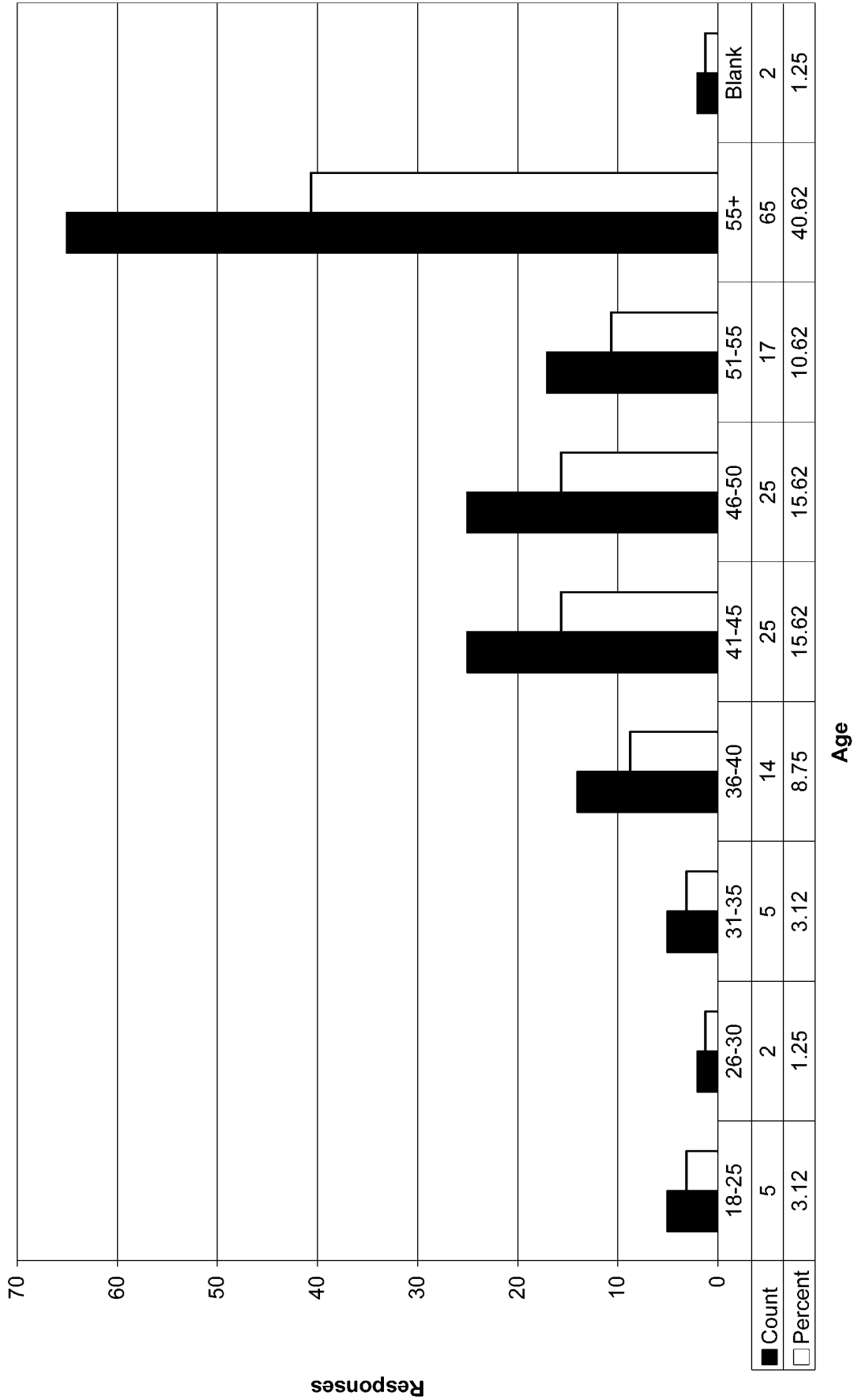
**How do you typically prepare the shrimp you eat?**  
 SCDNR Responses Only (n=160)



**What is your gender?**  
SCDNR Responses Only (n=160)

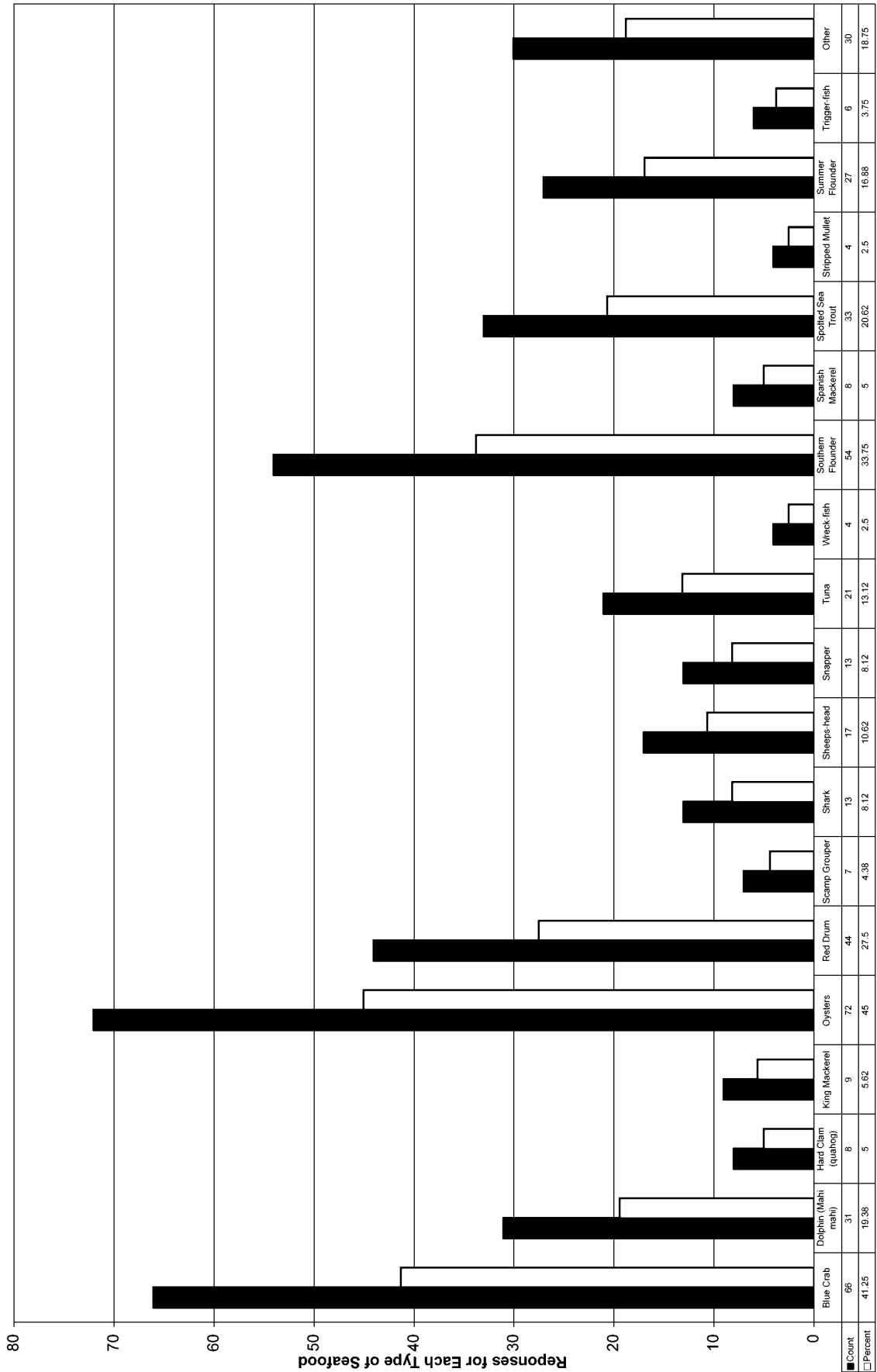


**What is your age?**  
SCDNR Responses Only (n=160)



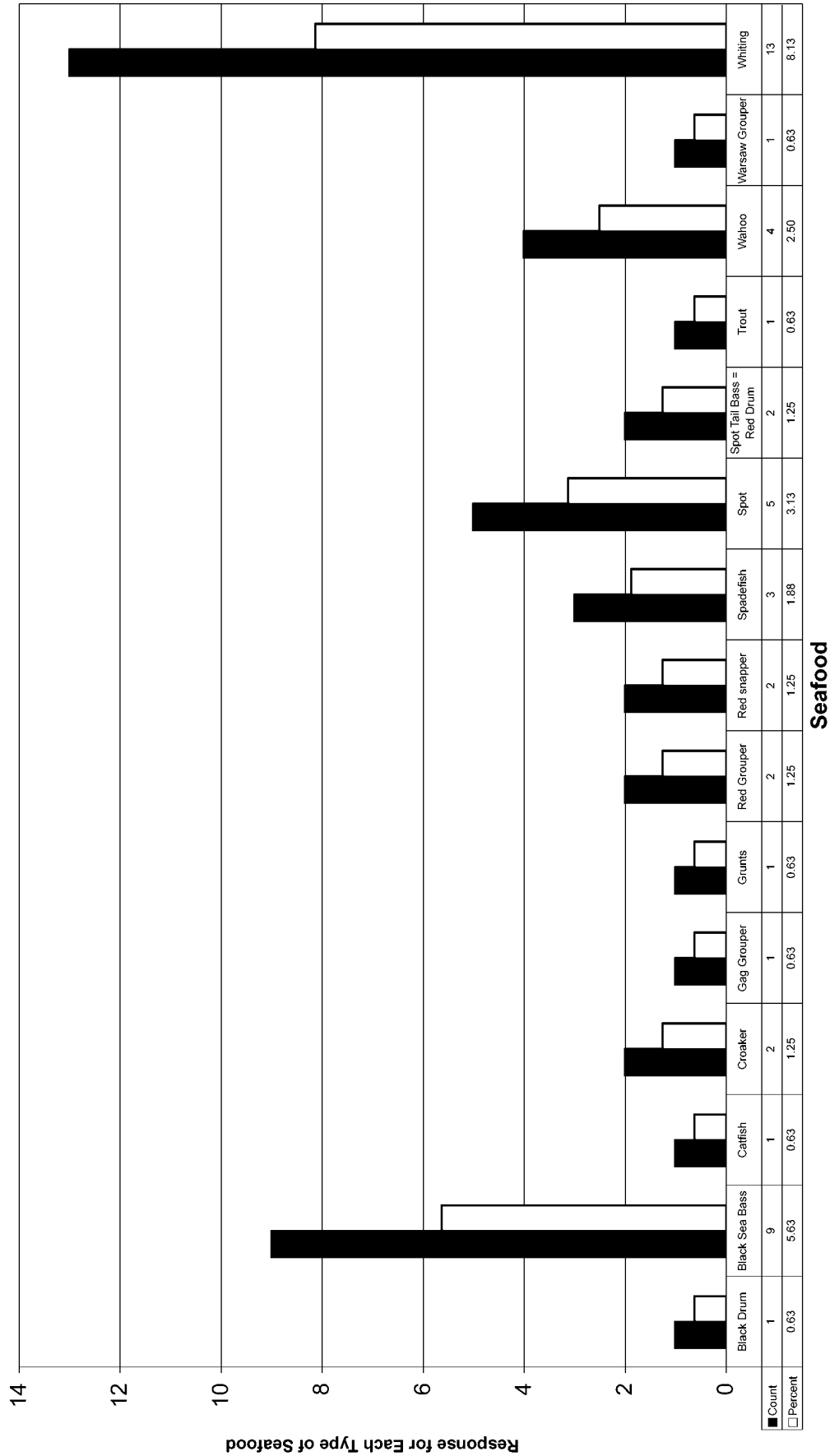
**In the last 12 months,  
what other locally caught seafood did you eat?**

SCDNR Responses Only (n=160)

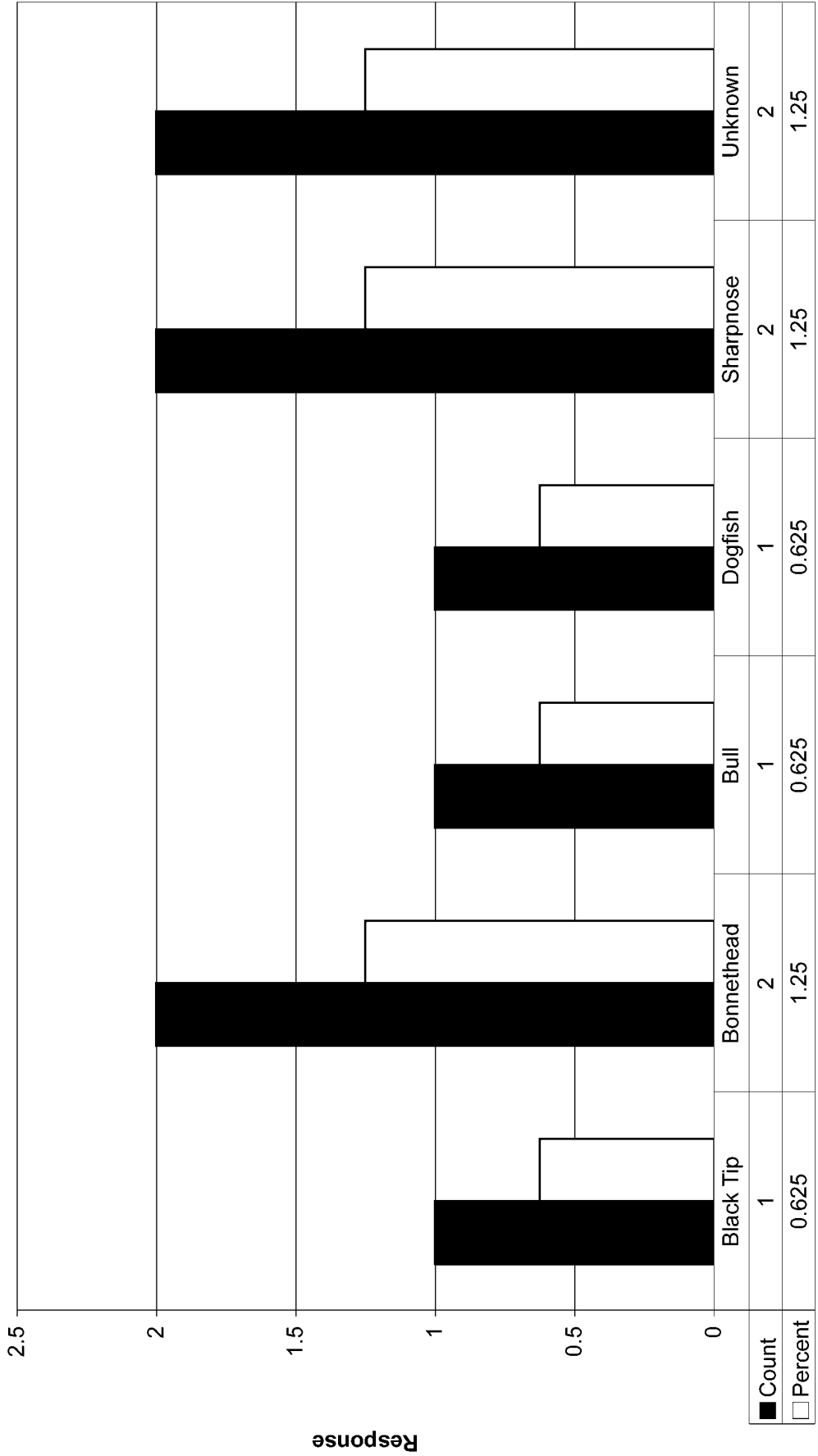


Seafood

**In the last 12 months,  
what other locally caught seafood did you eat?  
Response = Other SCDNR Responses Only (n=160)**



**In the last 12 months,  
what other locally caught seafood did you eat?  
Response = Shark SCDNR Responses Only (n=160)**



**Shark Species Consumed**



