Fish Trawling in Louisiana Inshore Waters

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Prepared for
Gulf and South Atlantic Fisheries Development Foundation
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and
David Bankston
Louisiana Sea Grant College Program
Louisiana Cooperative Extension Service

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ACKNOWLEDGMENTS

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Finally, we wish to thank Noel Usannaz, of New Orleans, Louisiana. As coinvestigator of the project and owner/operator of the Gros Comme Ca, his unselfish work for a better fishing industry is commendable.

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INTRODUCTION

As shrimp catches per vessel become smaller with more boats in the fishery, alternatives are becoming necessary to maintain profitability. Trawling for fish is a logical choice, since very little vessel modification is necessary and few gear changes are required. Markets for sheepshead and black drum have greatly increased in recent years; during the fall of 1987, these fish brought an average of $0.20 per pound and $0.60 per pound, respectively. The additional income is especially helpful at the end of a poor shrimping season. Fish trawl catches improve as fish school during colder weather.

Trawling is traditionally conducted off the northeast and northwest coasts of the United States and in European waters for cod, haddock, hake, and other bottomfish. Such trawls are constructed with large-mesh webbing for the wings and the front of the trawl body, with a smaller mesh through the rest of the trawl. This reduces drag, allowing greater net speed over the bottom without excessive fuel consumption.

The purpose of this trawling project was to experiment with different mesh sizes and trawl designs and compare efficiency with the trawl developed by Noel Usannaz of New Orleans for use in the Lake Borgne area of southeast Louisiana. In 1983, Usannaz began using a 4-seam fish trawl made primarily of 4" stretch mesh to catch sheepshead and black drum. The experimental trawls used in this project included the following.

1. Trawls of the same design, made of 5" and 6" webbing, in order to help eliminate undersized sheepshead (10" and less)
2. A bibbed trawl of the same design and mesh size
3. A 2-seam design of the same mesh size
4. The same design with greater headrope flotation

METHODS

Vessel Description

The vessel used for the project was the Gros Comme Ca, from the port of New Orleans. The 56-foot wooden double-rigger was powered with a 671 Detroit diesel with a 3.75 gear reduction, using a 38 x 33 5-blade propeller. The vessel's beam was 20 feet wide with a 4-foot draft. Deck equipment and rigging were standard for inshore shrimping, with 42-foot outriggers. At 1650 rpm, the estimated speed was 3 knots for each tow during the project.

Gear Description

The gear used to pull the trawls during the project was standard for shrimp trawl use. The bridles were 3/8" cable, 160 feet long, and were used as warps from the outriggers for each tow during the project. The wooden doors were 5' x 30"; although the middle board is sometimes removed to reduce drag during fish trawling, it remained for this project. A 1/4" tickler chain (30" shorter than the leadline) was used to increase crab bycatch for extra income, although it is not necessary for fish trawling. Each net used during the project had a 115-foot lazyline of 1/2" polydacron rope.
Nets. All mesh sizes noted are stretch measurements. The standard trawl used for comparison was a 4-seam, semiballoon design. The wings, top, sides, and bottom panels were made of 4”-#15 nylon webbing. The extension was made of 1 3/4”-#15 nylon webbing. The bag was made of 4”-#60 plastic webbing. The headrope was 25 feet long, 1/2” polydacron rope, with five 4” urethane floats. The leadline was 33 feet long, 1/2” polydacron rope, with 1/4” chain hung 15 links for each 12 hangings (6 hangings on each side of leadline center). The leg ropes between the trawl and the doors were 10 feet. The G-strings between the headrope and leadline were 10 feet long.

Trawls with 5” and 6” webbing followed the same 4-seam design, except that the extension and bag webbing sizes remained the same.

The bib or tab used for two of the trials was made of 2”-#15 nylon webbing and was sewn to the trawl two mesh-rows behind the headrope.

The construction of the 2-seam trawl was made from the same materials as the 4-seam trawl (Figures 1 and 2).

The extra headrope flotation added during the project consisted of urethane floats measuring 10” long and 22” round (circumference). During trial #3, one float was placed on the headrope just before each wing. During trial #4, two floats were added on to the front of each wing during the first three tows.

FISHING TECHNIQUES

The trawls were fished in a normal shrimping fashion for double-rigging. After each 1-1/2 hour tow, the nets were retrieved until the boards reached the ends of the outriggers, at which time the speed was increased to wash the catch to the back of the trawl. The catches from each side of the vessel were separately weighed onboard and recorded. A 16-foot test trawl was used off the port side but its catch was not included in the total catch of that side. The size ranges of the fish were periodically recorded. Small sheepshead (under 12” long) and bycatch were weighed and counted before being returned to the water.

RESULTS AND DISCUSSION

As with shrimping, tuning the standard 4-seam fish trawls was conducted so that both trawls would be performing equally prior to comparing other webbing sizes and designs. During trial #1, the starboard trawl’s tickler chain was found to be too short, after results showed a 32% higher sheepshead catch on the port side. This was reduced to 10% during trial #2 after the adjustment (Tables 1 and 2).

Extra headrope flotation was compared during trials #3 and #4. Trial #3 showed a 16% higher sheepshead catch with the extra flotation, but trial #4 was reversed, with a 4% higher catch with the standard trawl. Data from tow #1 were not used because of gear fouling. There was a substantially higher black drum catch during both trials with the extra flotation on the starboard side—20% higher during trial #3 and 60% higher during trial #4 (Tables 3 and 4). Generally, fish catch by trawls increases as the headrope height increases. This may have been the case with black drum on the starboard side. The drum catch of tow #3 during trial #4 is particularly noticeable.

Although a double-rigged vessel was used, there is no absolute guarantee that both sides were equal with equal gear, since vessel turning and the schooling capabilities of fish
Figure 1. Four-seam trawl schematic.
Figure 2. Two-seam trawl schematic.
can influence the catch. Double-rigged vessels in shallow water are considered to have less of an impact on a trawl's catch, however, than a single-rigged vessel.

Different trawl designs were compared during trials #5 and #6. During both trials, the standard 4-seam trawl on the port side caught more than the starboard 2-seam trawl - 24% higher during trial #5 and 18% higher during trial #6. Two-seam fish trawls are considered to be ideal (personal communication, Jim Barrett, National Marine Fisheries Service, Pascagoula), though in this case the 4-seam trawl proved superior.

Different mesh sizes were used during the trials #7 through #10. Both trawls were 4-seam designs, but the starboard trawl was built of either 5” or 6” webbing in the wings and trawl body. The port-side trawl with 4” webbing caught more fish during every two in all four trials, probably because the fish were caught by their gills in the 5” and 6” webbing. The larger webbing was used in an attempt to eliminate small sheepshead from the catch, but they were gilled along with larger sheepshead and other fish.

A bib was used with a 4-seam trawl during trials #11 and #12 on the starboard side. Although bibbed trawls generally catch more fish, this design did not appear to do so. No consistent difference occurred between the two trawls.

OTHER RESULTS

The highest catches during the project were 20-40 lbs. of sheepshead and black drum, produced by 30-minute test trawls. The test trawl catch commonly contained shrimp, croakers, mullet, stingrays, menhaden and other herring-like species. The resulting fish trawl bycatch consisted mainly of stingrays, mullet, and small sheepshead. Very few, if any, shrimp, spotted seatrout, red drum or other commercial species were caught by the fish trawls, although these species were often found in the test trawl catch. This is remarkably different from shrimp trawling, making fish trawls extremely efficient gear.

Through the course of the project, weather conditions were noted, including wind speed and direction, water color, temperature, and salinity. While trawling in shallow inshore waters, it appeared that single-rigged vessels performed better than double-rigged vessels in muddier waters. A higher percentage of black drum was caught in muddy water. Colder waters produced better results. The water temperature in Lake Borgne during the colder period of this study was 41° F, and the salinity was 10 parts per thousand, or about 30% seawater.

OTHER TRAWLS AND METHODS USED

Other trawls and methods were used on vessels operating nearby during this project. Flat 50-foot shrimp trawls and Mongoose shrimp trawls with or without a 4” mesh bag were used. All of these trawls reportedly caught fish, but ones with small mesh bags had much larger bycatches. Also, fuel consumption may have been greater with the increased drag of the smaller webbing. Faster speeds and longer warps also produced good results.

CONCLUSIONS

Over the 12 trawling days, 28,040 lbs. of salable fish were caught, including test trawl catch. The total sheepshead catch was 25,618 lbs. and the black drum catch was 2,422
lbs. At prices of $0.20 for sheepshead and $0.60 for black drum, over $6,500 was earned, not including the sale of a small amount of crab and mullet bycatch.

Catching fish during colder weather, when the inshore shrimp season is nearly over, helped 12 vessel operators and their crews in Louisiana's Lake Borgne area salvage a below-average trawling season, allowing many of them economic survival through the following winter.
TABLE 1. Trial #1, October 30, 1987

<table>
<thead>
<tr>
<th>TOW #1</th>
<th>STARBOARD SIDE (standard 4&quot;, 4-seam trawl)</th>
<th>PORT SIDE (standard 4&quot;, 4-seam trawl)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>346 lbs. sheephead</td>
<td>859 lbs. sheephead</td>
</tr>
<tr>
<td></td>
<td>8 lbs. black drum</td>
<td>15 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>14 lbs. small sheephead</td>
<td>39 lbs. small sheephead</td>
</tr>
<tr>
<td></td>
<td>13 lbs. stingrays</td>
<td>26 lbs. stingrays</td>
</tr>
<tr>
<td></td>
<td>2 lbs. spot</td>
<td>2 lbs. spot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 lbs. mullet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #2</th>
<th>813 lbs. sheephead</th>
<th>1075 lbs. sheephead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 lbs. black drum</td>
<td>21 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>35 lbs. small sheephead</td>
<td>63 lbs. small sheephead</td>
</tr>
<tr>
<td></td>
<td>1/2 lb. stingrays</td>
<td>1/2 lb. stingrays</td>
</tr>
<tr>
<td></td>
<td>1 pinfish</td>
<td>1 pinfish</td>
</tr>
<tr>
<td></td>
<td>1 hardened catfish</td>
<td>1 mullet</td>
</tr>
<tr>
<td></td>
<td>1 menhaden</td>
<td>2 cigarfish</td>
</tr>
<tr>
<td></td>
<td>1 spot</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #3</th>
<th>312 lbs. sheephead</th>
<th>688 lbs. sheephead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>29 lbs. black drum</td>
<td>13 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>26 lbs. small sheephead</td>
<td>48 lbs. small sheephead</td>
</tr>
<tr>
<td></td>
<td>3 mullet</td>
<td>2 mullet</td>
</tr>
<tr>
<td></td>
<td>2 spot</td>
<td>3 spot</td>
</tr>
<tr>
<td></td>
<td>1 sea robin</td>
<td>1 hardhead catfish</td>
</tr>
<tr>
<td></td>
<td>1 croaker</td>
<td>1 croaker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 pinfish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 southern puffer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #4</th>
<th>229 lbs. sheephead</th>
<th>701 lbs. sheephead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 lbs. black drum</td>
<td>10 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>15 lbs. small sheephead</td>
<td>37 lbs. small sheephead</td>
</tr>
<tr>
<td></td>
<td>2 lbs. stingrays</td>
<td>2 lbs. stingrays</td>
</tr>
<tr>
<td></td>
<td>3 spot</td>
<td>7 spot</td>
</tr>
<tr>
<td></td>
<td>1 southern flounder</td>
<td>1 sand seatrout (4&quot;)</td>
</tr>
<tr>
<td></td>
<td>1 hardhead catfish</td>
<td>1 mullet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 red drum (16&quot;)</td>
</tr>
</tbody>
</table>

Total crab catch for Trial #1 was 132 lbs.
**TABLE 2. Trial #2, November 18, 1987**

<table>
<thead>
<tr>
<th></th>
<th>STARBOARD SIDE</th>
<th>PORT SIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(standard 4”, 4-seam trawl)</td>
<td>(standard 4”, 4-seam trawl)</td>
</tr>
<tr>
<td><strong>TOW #1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 lbs. sheepshead</td>
<td>23 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>42 lbs. black drum</td>
<td>22 lbs. black drum</td>
</tr>
<tr>
<td><strong>bypatch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 stingrays</td>
<td>6 stingrays</td>
</tr>
<tr>
<td></td>
<td>2 southern flounders</td>
<td>1 southern flounder</td>
</tr>
<tr>
<td></td>
<td>1 croaker</td>
<td>1 hardhead catfish</td>
</tr>
<tr>
<td></td>
<td>1 shrimp</td>
<td>1 red drum (12”)</td>
</tr>
<tr>
<td><strong>TOW #2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>108 lbs. sheepshead</td>
<td>150 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>56 lbs. black drum</td>
<td>61 lbs. black drum</td>
</tr>
<tr>
<td><strong>bypatch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>69 lbs. small sheepshead</td>
<td>60 lbs. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>10 stingrays</td>
<td>16 stingrays</td>
</tr>
<tr>
<td></td>
<td>2 southern flounders</td>
<td>1 southern flounder</td>
</tr>
<tr>
<td></td>
<td>1 shrimp</td>
<td>1 shrimp</td>
</tr>
<tr>
<td></td>
<td>1 croaker</td>
<td>1 croaker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 menhaden</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 hardhead catfish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 red drum (23”, 14”, 14”)</td>
</tr>
<tr>
<td><strong>TOW #3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>71 lbs. sheepshead</td>
<td>111 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>41 lbs. black drum</td>
<td>51 lbs. black drum</td>
</tr>
<tr>
<td><strong>bypatch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>82 lbs. small sheepshead</td>
<td>82 lbs. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>1 mullet</td>
<td>3 mullet</td>
</tr>
<tr>
<td></td>
<td>1 southern kingfish</td>
<td>1 sea robin</td>
</tr>
<tr>
<td></td>
<td>1 red drum (15”)</td>
<td>1 spotted seatrout (15”)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 shrimp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 spot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 stingrays</td>
</tr>
</tbody>
</table>

Total crab catch for Trial #2 was 191 lbs.
<table>
<thead>
<tr>
<th></th>
<th>STARBOARD SIDE</th>
<th>PORT SIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4&quot;, 4-seam trawl with extra headrope flotation)</td>
<td>(standard 4&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td>TOW #1</td>
<td>55 lbs. sheepshead</td>
<td>35 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>85 lbs. black drum</td>
<td>55 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>103 lbs. small sheepshead</td>
<td>90 lbs. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>10 stingrays</td>
<td>6 stingrays</td>
</tr>
<tr>
<td>TOW #2</td>
<td>11 lbs. sheepshead</td>
<td>8 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>28 lbs. black drum</td>
<td>11 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>10 lbs. small sheepshead</td>
<td>19 lbs. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>12 stingrays</td>
<td>4 stingrays</td>
</tr>
<tr>
<td>TOW #3</td>
<td>420 lbs. sheepshead</td>
<td>310 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>105 lbs. black drum</td>
<td>80 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>110 lbs. small sheepshead</td>
<td>80 lbs. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>4 stingrays</td>
<td>4 stingrays</td>
</tr>
<tr>
<td>TOW #4</td>
<td>305 lbs. sheepshead</td>
<td>210 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>22 lbs. black drum</td>
<td>20 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>22 lbs. small sheepshead</td>
<td>40 lbs. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>4 stingrays</td>
<td>8 stingrays</td>
</tr>
<tr>
<td>TOW #5</td>
<td>120 lbs. sheepshead</td>
<td>100 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>8 lbs. black drum</td>
<td>8 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>50 lbs. small sheepshead</td>
<td>40 lbs. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>8 stingrays</td>
<td>8 stingrays</td>
</tr>
</tbody>
</table>
### TABLE 4. Trial #4, November 23, 1987

<table>
<thead>
<tr>
<th>STARBOARD SIDE</th>
<th>PORT SIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4&quot;, 4-seam trawl with extra headrope flotation)</td>
<td>(standard 4&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td><strong>TOW #1</strong></td>
<td><strong>TOW #2</strong></td>
</tr>
<tr>
<td>461 lbs. sheephead</td>
<td>178 lbs. sheephead</td>
</tr>
<tr>
<td>10 lbs. black drum</td>
<td>12 lbs. black drum</td>
</tr>
<tr>
<td><strong>bycatch</strong></td>
<td><strong>bycatch</strong></td>
</tr>
<tr>
<td>34 lbs. small sheephead</td>
<td>30 lbs. small sheephead</td>
</tr>
<tr>
<td>2 mullet</td>
<td>7 stingrays</td>
</tr>
<tr>
<td>2 menhaden</td>
<td>3 mullet</td>
</tr>
<tr>
<td>3 stingrays</td>
<td>1 menhaden</td>
</tr>
<tr>
<td>1 croaker</td>
<td>10 stingrays</td>
</tr>
<tr>
<td>948 lbs. sheephead</td>
<td>229 lbs. sheephead</td>
</tr>
<tr>
<td>73 lbs. black drum</td>
<td></td>
</tr>
</tbody>
</table>

The starboard trawl and boards during tow #1 were fouled with a gill net.

<table>
<thead>
<tr>
<th><strong>TOW #3</strong></th>
<th><strong>TOW #4</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>493 lbs. sheephead</td>
<td>583 lbs. sheephead</td>
</tr>
<tr>
<td>303 lbs. black drum</td>
<td>31 lbs. black drum</td>
</tr>
<tr>
<td><strong>bycatch</strong></td>
<td><strong>bycatch</strong></td>
</tr>
<tr>
<td>53 lbs. small sheephead</td>
<td>60 lbs. small sheephead</td>
</tr>
<tr>
<td>5 stingrays</td>
<td>8 stingrays</td>
</tr>
<tr>
<td>1 sea robin</td>
<td>1 mullet</td>
</tr>
<tr>
<td>1 croaker</td>
<td>1 spotted seatrout (8&quot;)</td>
</tr>
<tr>
<td>1 spotted seatrout (8&quot;)</td>
<td>1 spotted seatrout (5&quot;)</td>
</tr>
<tr>
<td>470 lbs. sheephead</td>
<td>617 lbs. sheephead</td>
</tr>
<tr>
<td>63 lbs. black drum</td>
<td>22 lbs. black drum</td>
</tr>
<tr>
<td>63 lbs. small sheephead</td>
<td>76 lbs. small sheephead</td>
</tr>
<tr>
<td>8 stingrays</td>
<td>6 stingrays</td>
</tr>
<tr>
<td>4 mullet</td>
<td>2 mullet</td>
</tr>
<tr>
<td>1 sea robin</td>
<td>1 spotted seatrout (5&quot;)</td>
</tr>
</tbody>
</table>

Total crab catch for Trial #4 was 120 lbs.
<table>
<thead>
<tr>
<th></th>
<th>STARBOARD SIDE</th>
<th>PORT SIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4&quot;, 2-seam trawl)</td>
<td>(standard 4&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td>TOW #1</td>
<td>131 lbs. sheepshead</td>
<td>353 lbs. sheepshead</td>
</tr>
<tr>
<td>bycatch</td>
<td>12 stingrays</td>
<td>8 stingrays</td>
</tr>
<tr>
<td></td>
<td>1 spotted seatrout (5&quot;)</td>
<td>1 spotted seatrout (6&quot;)</td>
</tr>
<tr>
<td></td>
<td>1 menhaden</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 southern kingfish</td>
<td></td>
</tr>
<tr>
<td>TOW #2</td>
<td>219 lbs. sheepshead</td>
<td>337 lbs. sheepshead</td>
</tr>
<tr>
<td>bycatch</td>
<td>6 lbs. small sheepshead</td>
<td>1 sea robin</td>
</tr>
<tr>
<td></td>
<td>6 menhaden</td>
<td>1 menhaden</td>
</tr>
<tr>
<td></td>
<td>6 mullet</td>
<td>2 mullet</td>
</tr>
<tr>
<td></td>
<td>1 flounder</td>
<td>1 spot</td>
</tr>
<tr>
<td></td>
<td>16 stingrays</td>
<td>4 stingrays</td>
</tr>
<tr>
<td>TOW #3</td>
<td>124 lbs. sheepshead</td>
<td>102 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>1 lb. small sheepshead</td>
<td>1 lb. small sheepshead</td>
</tr>
<tr>
<td></td>
<td>10 stingrays</td>
<td>5 stingrays</td>
</tr>
<tr>
<td></td>
<td>7 mullet</td>
<td>5 mullet</td>
</tr>
</tbody>
</table>

Total crab catch for Trial #5 was 90 lbs.
TABLE 6. Trial #6, December 1, 1987

<table>
<thead>
<tr>
<th></th>
<th>STARBOARD SIDE</th>
<th>PORT SIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4&quot;, 2-seam trawl)</td>
<td>(standard 4&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td>TOW #1</td>
<td>116 lbs. sheepshead</td>
<td>143 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>8 lbs. black drum</td>
<td>26 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>5 mullet</td>
<td>10 mullet</td>
</tr>
<tr>
<td></td>
<td>4 stingrays</td>
<td>8 stingrays</td>
</tr>
<tr>
<td></td>
<td>5 lbs. small sheepshead</td>
<td>2 lbs. small sheepshead</td>
</tr>
<tr>
<td>TOW #2</td>
<td>117 lbs. sheepshead</td>
<td>171 lbs. sheepshead</td>
</tr>
<tr>
<td>bycatch</td>
<td>2 mullet</td>
<td>1 mullet</td>
</tr>
<tr>
<td></td>
<td>5 stingrays</td>
<td>5 stingrays</td>
</tr>
<tr>
<td>TOW #3</td>
<td>6 lbs. sheepshead</td>
<td>33 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>2 stingrays</td>
<td>4 stingrays</td>
</tr>
<tr>
<td>TOW #1</td>
<td>STARBOARD SIDE (5&quot;, 4-seam trawl)</td>
<td>PORT SIDE (standard 4&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td></td>
<td>197 lbs. sheepshead</td>
<td>264 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>17 lbs. black drum</td>
<td>59 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>5 stingrays</td>
<td>4 stingrays</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOW #2</td>
<td>219 lbs. sheepshead</td>
<td>233 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>8 stingrays</td>
<td>5 stingrays</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOW #3</td>
<td>341 lbs. sheepshead</td>
<td>485 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>2 lbs. black drum</td>
<td>6 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>6 stingrays</td>
<td>6 stingrays</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOW #4</td>
<td>277 lbs. sheepshead</td>
<td>288 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>20 lbs. black drum</td>
<td>35 lbs. black drum</td>
</tr>
<tr>
<td>TOW #1</td>
<td>STARBOARD SIDE (5&quot;, 4-seam trawl)</td>
<td>PORT SIDE (standard 4&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td></td>
<td>191 lbs. sheepshead 37 lbs. black drum</td>
<td>234 lbs. sheepshead 27 lbs. black drum</td>
</tr>
<tr>
<td>bycatch</td>
<td>20 lbs. stingrays</td>
<td>30 lbs. stingrays</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>309 lbs. sheepshead 35 lbs. black drum</td>
<td>430 lbs. sheepshead 29 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>25 lbs. bycatch</td>
<td>10 lbs. bycatch</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #3</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>320 lbs. sheepshead 13 lbs. black drum</td>
<td>372 lbs. sheepshead 20 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>7 lbs. bycatch</td>
<td>5 lbs. bycatch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #4</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>148 lbs. sheepshead 5 lbs. black drum</td>
<td>219 lbs. sheepshead 30 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>10 lbs. bycatch</td>
<td>15 lbs. bycatch</td>
</tr>
<tr>
<td>TOW #1</td>
<td>STARBOARD SIDE (6&quot;, 4-seam trawl)</td>
<td>PORT SIDE (standard 4&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td></td>
<td>159 lbs. sheepshead</td>
<td>194 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>15 lbs. black drum</td>
<td>25 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>10 lbs. bycatch</td>
<td>20 lbs. bycatch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>233 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>10 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>25 lbs. bycatch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>66 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>6 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>40 lbs. bycatch</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TOW #3</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80 lbs. sheepshead</td>
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<tr>
<td></td>
<td>10 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>35 lbs. bycatch</td>
</tr>
<tr>
<td></td>
<td>STARBOARD SIDE</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td></td>
<td>(6&quot;, 4-seam trawl)</td>
</tr>
<tr>
<td>TOW #1</td>
<td>268 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>20 lbs. black drum</td>
</tr>
<tr>
<td></td>
<td>13 lbs. bycatch</td>
</tr>
<tr>
<td>TOW #2</td>
<td>322 lbs. sheepshead</td>
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<tr>
<td></td>
<td>60 lbs. black drum</td>
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<tr>
<td>TOW #3</td>
<td>186 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>65 lbs. black drum</td>
</tr>
<tr>
<td>TOW #1</td>
<td>STARBOARD SIDE</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>(4&quot;, 4-seam trawl with bib)</td>
</tr>
<tr>
<td></td>
<td>314 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>15 lbs. black drum</td>
</tr>
<tr>
<td>TOW #2</td>
<td>100 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>12 lbs. black drum</td>
</tr>
<tr>
<td>TOW #3</td>
<td>192 lbs. sheepshead</td>
</tr>
<tr>
<td></td>
<td>15 lbs. black drum</td>
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</table>
**TABLE 12. Trial #12, December 31, 1987**

<table>
<thead>
<tr>
<th></th>
<th>STARBOARD SIDE</th>
<th>PORT SIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(4&quot;., 4-seam trawl with bib)</td>
<td>(standard 4&quot;., 4-seam trawl)</td>
</tr>
<tr>
<td><strong>TOW #1</strong></td>
<td></td>
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</tr>
<tr>
<td>lbs. sheepshead</td>
<td>358</td>
<td>323 lbs. sheepshead</td>
</tr>
<tr>
<td>lbs. black drum</td>
<td>30</td>
<td>25 lbs. black drum</td>
</tr>
<tr>
<td>lbs. mullet</td>
<td>30</td>
<td>30 lbs. mullet</td>
</tr>
<tr>
<td><strong>TOW #2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lbs. sheepshead</td>
<td>435</td>
<td>417 lbs. sheepshead</td>
</tr>
<tr>
<td>lbs. black drum</td>
<td>35</td>
<td>27 lbs. black drum</td>
</tr>
<tr>
<td><strong>TOW #3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lbs. sheepshead</td>
<td>400</td>
<td>433 lbs. sheepshead</td>
</tr>
<tr>
<td>lbs. black drum</td>
<td>30</td>
<td>30 lbs. black drum</td>
</tr>
</tbody>
</table>