

# Final Report of Fishery Resource Grant Project 2018

**Project Title:** Determine Methods to reduce Bycatch of juvenile Atlantic Croaker (*Micropogonias undulates*) in Haul Seines (Continued)

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## Introduction

The juvenile Atlantic Croaker ( *Micropogonias undulates* ) population is being severely cut down in the summer months by haul seines in the Chesapeake bay. It is common for commercial haul seines to land thousands of pounds of fish. When these fish are processed a large percentage of the smallest fish are sold on the bait market for a low price of .04 cents per pound. The high amount of small baitfish harvested annually by haul seines is only hurting future harvest of larger, more valuable fish. The bait caught is mostly Croaker but also includes Spot (*Leiostomus xanthurus*), Spotted Seatrout (*Cynoscion nebulosus*), and Weakfish (*Cynoscion regalis*), all important recreational and commercial fish species in the Chesapeake Bay.

Previous studies to reduce landing of small fish in haul seines used larger mesh net within the seine (FRG 2016), and a culling table onboard the boat (FRG 2017). These gear modifications resulted in modest reductions of bait fish in some trials. The main objective of this project is to demonstrate a way that will reduce the catch of small baitfish in the commercial haul seine fishery through the use of an escape panel composed of larger than usually webbing in the pocket (holding pen) allowing fish to escape before being brought on board.

## Methods

When Haul seining a net stretching up to 1000 yard is used to corral fish into a holding pen. These holding pens range in size from 10' x 10' to 30' x 50'. The Haul seine used in this study was 1000 yards long. This net included 900 yards of three" mesh and a 100 yard section of 2 ¼" mesh used when the fish go into the pocket to reduce gilling. The two pockets used in this study were 20' x 40'. These pockets have three sides and a bottom. Once the fish have been pulled into the pocket from the seine using a wing (a 75' piece of small mesh net used to pull the fish from the seine to the pocket) the front of the pocket is lifted out of the water and held above the water line with wooden poles.

The first standard sized pocket is made of the traditional 1" mesh all around the pocket. The experimental pocket that was used was 1" mesh on the sides and bottom of the pocket. This pocket included an escape panel that was made of 3" net on the back of the pocket. This

escape panel stretched 20' across the back of the pocket and would go from top to bottom which would range anywhere from two to six feet deep depending on the area and the tide.

Once the fish were put into the pocket they would then stay in there for around four hours while the tide came up to allow a boat to come and load the fish on board. This was done 16 times over the summer with eight comparisons of the two pockets. Once fish were loaded on board they were then carried to Wanchese Fish Company where they were graded and weighed

The study was conducted in the lower portion of the Chesapeake Bay in the waters surrounding Poquoson Virginia. These bodies of water include Back River, Poquoson Flats, and Poquoson River.



*Figure 1. Standard pocket without escape panel after fish have been caught.*



*Figure 2. Experimental pocket after fish have been caught. During this time as the tide raises to allow the fished to be bailed there is around a four hour window for fish to escape.*



Figure 3. Close of the escape panel sewed into the pocket showing the difference in mesh size.



Figure 4. Fish that were just too big to escape out of the panel gilled in the webbing and were needed to be picked out.



Figure 5. Study area around Poquoson, Va

## Results

A total of 16 fishing trips were made in this study. No changes were made to the size of the escape panel so there would be ample data for knowing the effectiveness of the escape panel used. Below are the weights from each day showing the catch from all 16 trips.

### Comparison 1

#### Standard Pocket

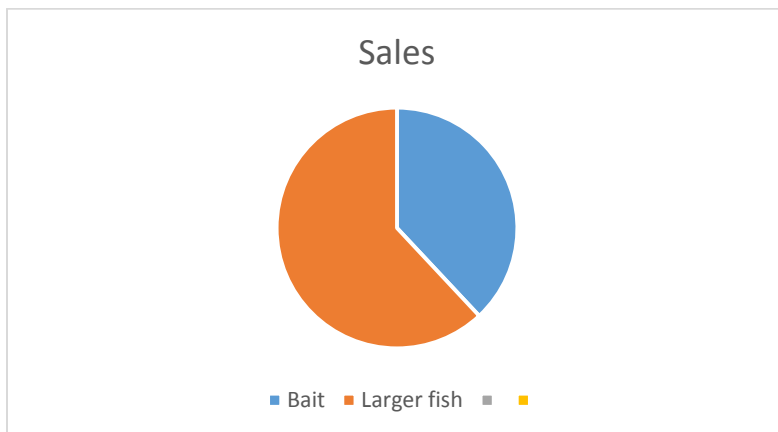
Bait-5875 lbs.

Small Croaker-9460 lbs.

Medium Spot-73 lbs.

Speckled Trout-9 lbs.

Houndfish-34 lbs.



#### Experimental Pocket

Bait-1550lbs.

Small Croaker-2890lbs.

Small Spot-150lbs

Sheepshead-2lbs.

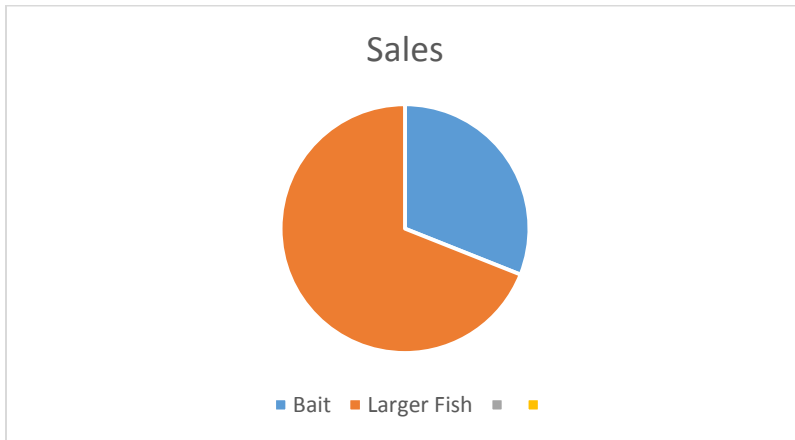
Speckled Trout-20lbs.

Spadefish-10lbs.

Houndfish-367lbs.

Bluefish-5lbs.

Roundhead-2lbs.



### **Comparison 2**

#### **Standard Pocket**

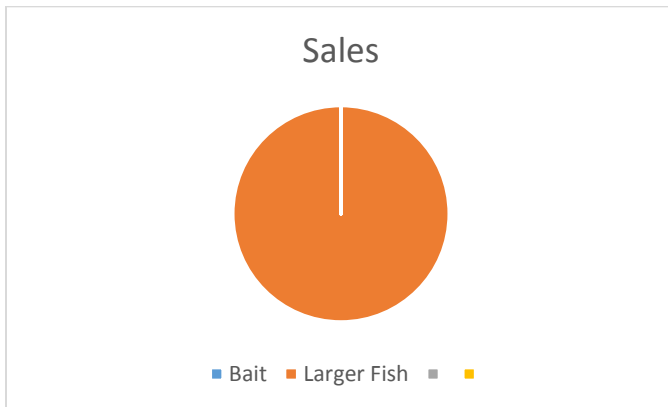
Medium Croaker-330lbs.

Medium Spot-17lbs.

Mullet-3lbs.

Houndfish-1050lbs.

Bluefish-12lbs.



#### **Experimental Pocket**

Medium Spot-99lbs.

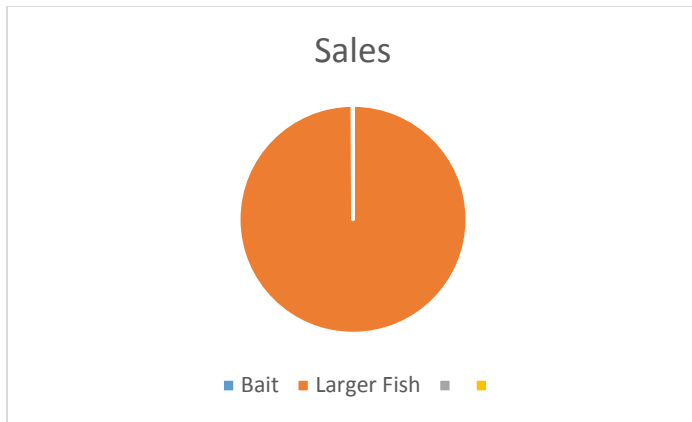
Large Croaker-1262lbs.

Croaker-155lbs.

Spadefish-72lbs

Houndfish-660lbs.

Bluefish-4lbs.



### **Comparison 3**

#### **Standard Pocket**

Bait-9350lbs.

Small Croaker-4925lbs.

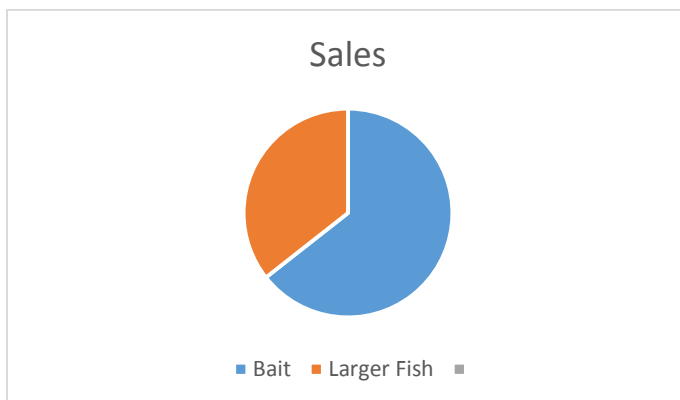
Small Spot-194lbs.

Houndfish-2lbs.

Speckled Trout-38lbs.

Spadefish-1lb.

Bluefish-7lbs.



#### **Experimental Pocket**

Bait-2150lbs.

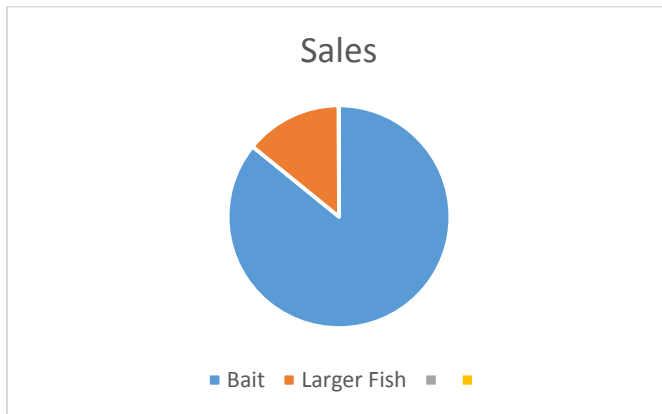
Small Croaker-295lbs.

Small Spot-25lbs.

Spadefish-5lbs.

Speckled Trout-14lbs.

Cobia-14lbs.



#### **Comparison 4**

##### **Standard pocket**

Bait-2670lbs.

Small Croaker-1335lbs.

Small Spot-239lbs.

Striped Bass-4lbs.

Houndfish-60lbs

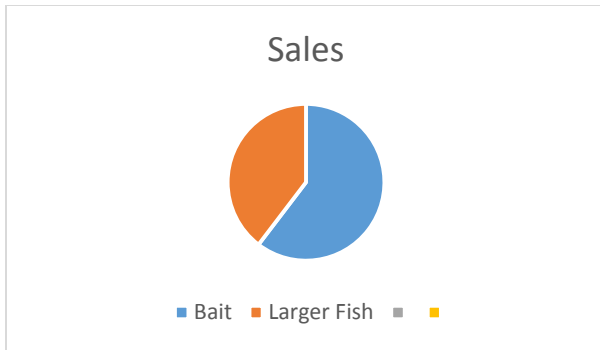
Spadefish-44lbs.

Speckled Trout-39lbs.

Bluefish-24lbs.

Roundhead-4lbs.

Flounder-4lbs.



### **Experimental Pocket**

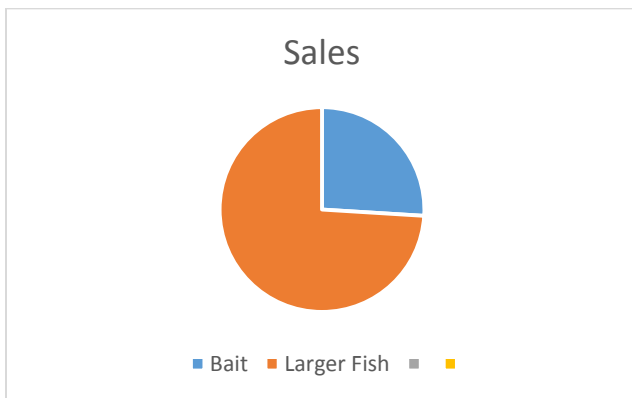
Bait-4050lbs.

Croaker-10150lbs.

Medium Croaker-1163lbs.

Houndfish-15lbs.

Small Spot-213lbs.



### **Comparison 5**

#### **Standard Pocket**

Bait-922lbs

Croaker-200lbs.

Small Croaker-647lbs.

Medium Spot-17lbs.

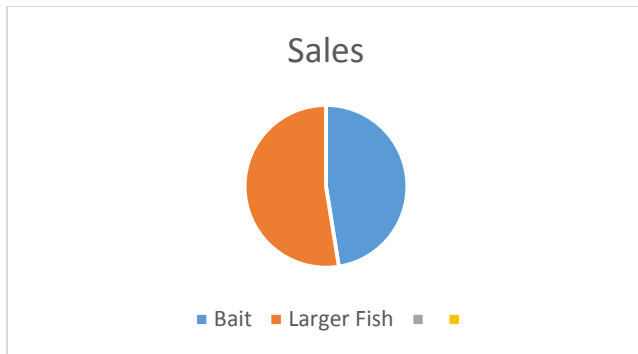
Small Spot-50lbs.

Speckled Trout-5lbs.

Roundhead-2lbs.

Spadefish-97lbs.

Bluefish-2lbs.



### **Experimental Pocket**

Bait-116lbs.

Medium Croaker-132lbs.

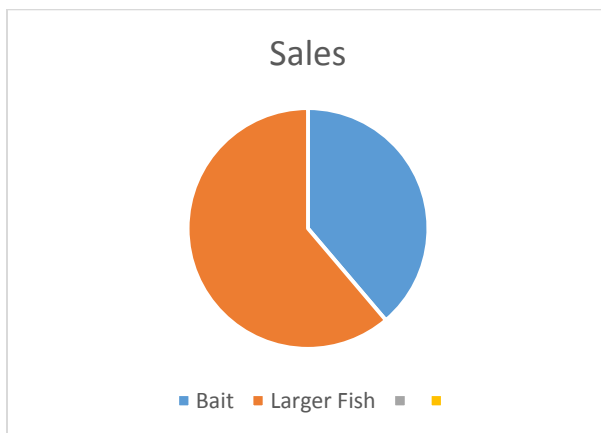
Flounder-3lbs.

Spanish Mackerel-6lbs.

Bluefish-10lbs.

Speckled Trout-10lbs.

Small Spot-22lbs.



### **Comparison 6**

#### **Standard Pocket**

Bait-10485lbs

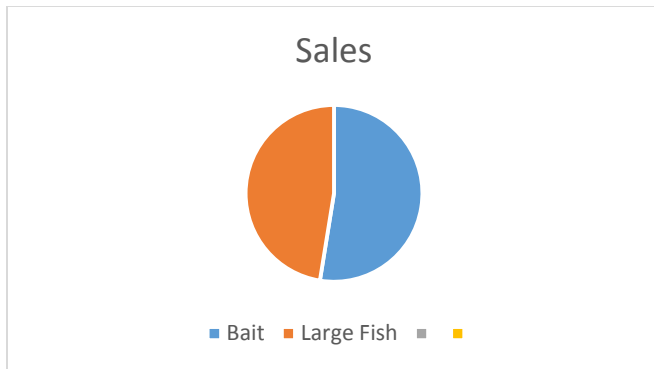
Croaker-8905lbs.

Small Spot-534lbs.

Speckled Trout-3lbs.

Spadefish-7lbs.

Bluefish-17lbs.



### **Experimental Pocket**

Bait-1175lbs.

Small Croaker-1350lbs.

Croaker-193lbs.

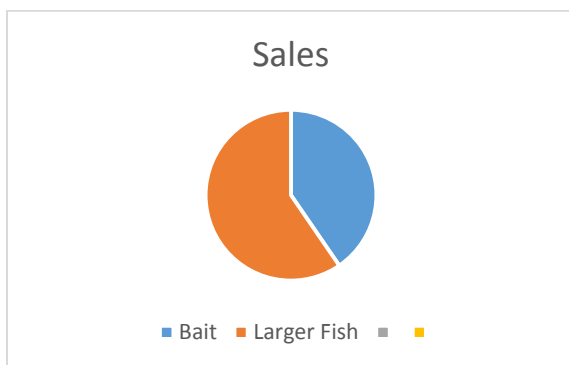
Medium Croaker-50lbs.

Small Spot-105lbs.

Bluefish-15lbs.

Roundhead-3lbs.

Speckled Trout-15lbs.

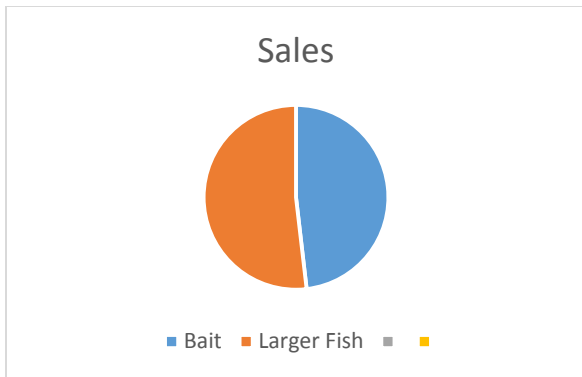


### **Comparison 7**

#### **Standard Pocket**

Bait-3730lbs.

Small Croaker-4015lbs.



### **Experimental Pocket**

Bait-1800lbs.

Flounder-6lbs.

Small Croaker-1700lbs.

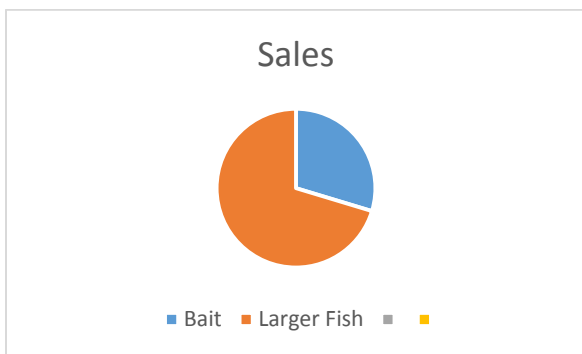
Large Medium Croaker-2000lbs.

Small Spot-370lbs.

Spadefish-8lbs.

Speckled Trout-31lbs.

Bluefish-153lbs.



### **Comparison 8**

#### **Standard Pocket**

Bait-3076lbs.

Small Croaker-1900lbs.

Small Spot-342lbs.

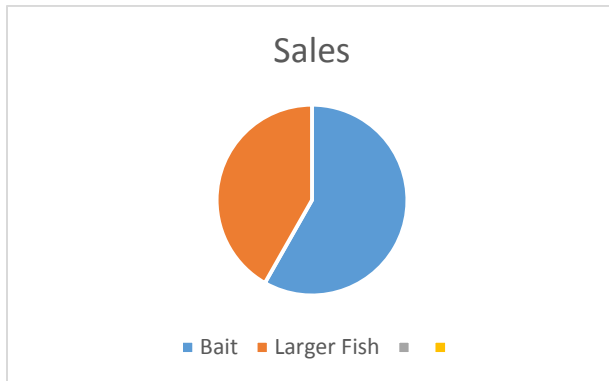
Menhaden-200lbs

Spadefish-50lbs.

Speckled Trout-16lbs.

Flounder-7lbs.

Bluefish-35lbs.

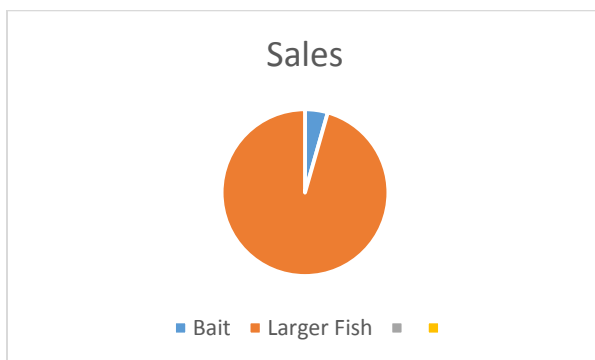


### **Experimental Pocket**

Bait-150lbs.

Small Croaker-2300lbs.

Medium Croaker-950lbs.

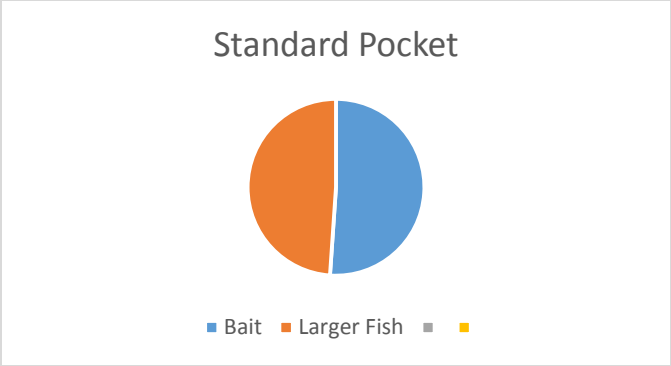


### **Total Weights**

#### **Standard Pocket**

Bait-36,308lbs.

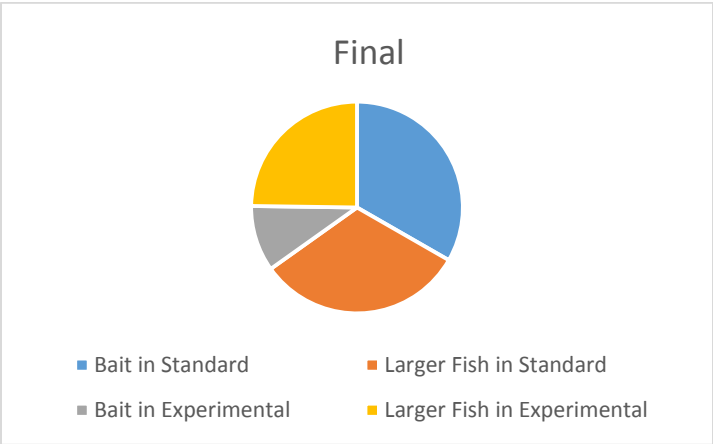
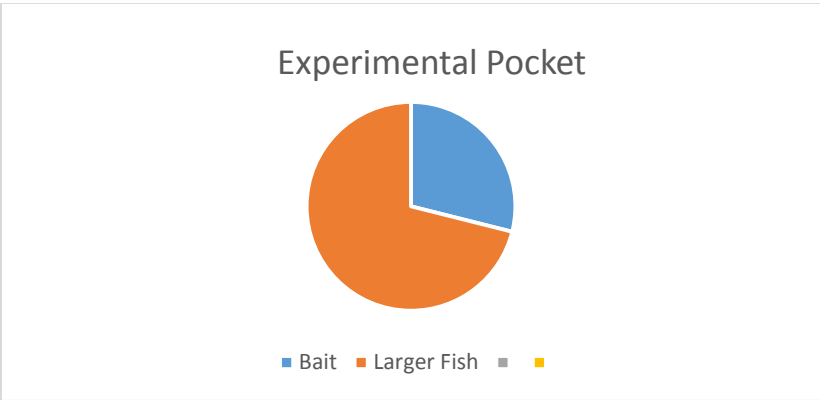
Larger Fish-34,759lbs.



**Experimental Pocket**

Bait-10,991lbs.

Larger Fish-27,018lbs.



**Project Result Summary**

The Hope of this study was to allow the smaller bait sized fish to escape the pocket before bailing onboard. The goal was to determine if the mesh size used was proper to allow the correct class of fish to escape while keeping the larger fish in the pocket. The experimental

pocket was used eight times alongside of the standard pocket that was also used eight times. All of the comparisons that were done were within three days of each other and in the same area. A haul would be done and all of the fish would be put into either the standard or experimental pocket. Whichever pocket that was not used would be used soon after and in the same location thus completing one of the eight comparisons. When we began using the experimental pocket we first tried to purse the fish into the direction of the escape panel. Doing this forced all of the fish into it which at first sounded like it would be the best way of reducing catch of bait. The only thing forcing the fish to the escape panel did was force the fish into gilling in nearly every mesh. When the fish were not pressured into the escape panel the larger ones that could not completely escape would usually not gill making the use of the panel more efficient (figure. 4).

We found that the use of an escape panel could be a very effective and efficient way of reducing bait harvests in haul seines. The escape panel used was not the right sized mesh to be a perfect size for the panel. Most times when the panel was used there was a noticeably less amount of fish in the pocket before bailing after a few hours allowing the fish to escape. The problem faced with this escape panel is that the mesh sized was too large and allowed a lot of “small” croaker to escape and not just the desired “bait”. A reduction in the mesh size of the escape panel by 1/4” or possibly even 1/8” would more than likely make an escape panel that could be very useful.

The standard pocket that was used this year caught around 50% bait and 50% larger fish. The experimental pocket caught around 33% bait and 66% larger fish. This data shows that the escape panel was effective in allowing bait to escape. The experimental pocket also only caught around 40% of the fish that were harvested in over the study and the standard was responsible for around 60%. There was also less larger fish harvested in the experimental pocket due to an improper mesh size allowing bigger fish to escape.

More work needs to be done with escape panels to limit the amount of small croaker harvested in haul seines. Once an escape panel can be perfected it could then be added to the larger meshed seines (FRG 2016) and a finished culling table which was worked with but not perfected (FRG 2017) both of which have been shown to reduce bait harvested.

#### Acknowledgment

This work was performed with help from commercial fishers George Trice IV and V. Project field management and report preparation was performed by George Trice V. and Bob Fisher (VIMS Marine Advisory Services).