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Project Title: Development of a live fish market through the use of a new live holding gear that will reduce fish mortality.

#### Fishery Resource Grant Final Report Statement

This project started out slowly because so much labor and materials were needed for the design and implementation of the project. The purpose of this project was to develop a live fish market through the use of new live holding gear that would also reduce fish mortality. There is a need for watermen to learn how to keep their fish product alive, as opposed to the current practice of icing fish down. Fish that are iced down will only keep for twenty-one days, as far as safe consumer food consumption is concerned. The market buyer knows this and the market price reflects this. If the watermen were able to develop a process in which to hold the fish alive and sell the product alive, it would create a fresher and higher value product. It would also increase the time that the waterman could hold his product, and negotiate a higher price at the market.

I placed two 5000-gallon holding tanks in the ground and designed a closed loop water recirculation system with a biological filtration system, large enough to handle the volume of water and density of fish that I planned to hold in the tanks. With the initial design of the system, I only planned on one pound of fish per gallon as a stocking density. I added an aeration system to the holding tanks, which enabled me to increase my holding density to two to three pounds of fish per gallon. I experimented with the salinity levels, based on the amount of fish per volume of water, to determine what salinity was needed for the prevention of fish skin problems in the tanks. The average range of salinity that was optimum in my tanks was 2-3 parts per thousand. As I observed the catfish in the holding tanks, I noticed that the cooler the water temperature, the fish exhibited less stress and maintained a level weight. I reduced the density of fish in the holding tanks to about one pound per gallon and found that they were less likely to stick each other and therefore could be held longer. I discovered that the Mississippi Blue Catfish will not tolerate our Virginia Bullhead Catfish in the same holding tanks, and in fact the blue cats killed the bullheads. By purging these catfish in the holding tanks, I found that they lost their wild, oily taste as I had anticipated, thus improving their marketability.

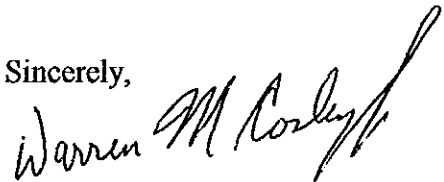
The catfish market is mainly a fall, winter and spring endeavor, which works well with the cooler water temperatures both in the rivers and in the holding tanks. After the spring

run of catfish is over, the holding tanks can be used for holding croaker, spot and other saltwater species. I have had quite a few watermen, mostly pound netters, interested enough to come by and examine my holding system to see if it would work for them. They expressed an interest in this type of system, not only for holding food fish, but also to hold bait fish, for which there seems to be a good live market.

I designed and constructed the live holding transport pen and set it in the river. This device was used not just for holding fish, but also for transporting fish from the trap to the pick-up ramp. The transport pen worked well in the river, but I discovered when it was used as a holding pen during purging that the web size of the net flooring was too small. The mesh size in the floor needs to be larger to allow food particles from the catfish purging to pass through the net. As part of the conditions of the Special Permit issued by the VMRC, I was not allowed to feed any fish being held in the holding pen in the river any type of man-made food or chopped chum. Consequently, as the fish purged in the holding pen, it was food they had ingested prior to capture by me in the wild. Other than this problem, the holding pen worked very well. I have had several inquiries from other watermen, interested in the holding pen design for their possible use.

My recommendation from this project includes the use of aeration to supplement the closed-loop recirculating system with a biological filter. The salinity level of the water in the recirculating system must be maintained at two to three parts per thousand in order to keep the fish healthy and stressfree. What really impressed me the most was the versatility of the system for holding so many different commercial species alive and in good market condition. I see this type of system as a future for commercial watermen in holding their live product for a fresh market and a higher priced product. This will also decrease wastage in the seafood industry.

Sincerely,

A handwritten signature in black ink, reading "Warren M. Cosby Jr." with a stylized flourish at the end.

Warren M. Cosby Jr.