

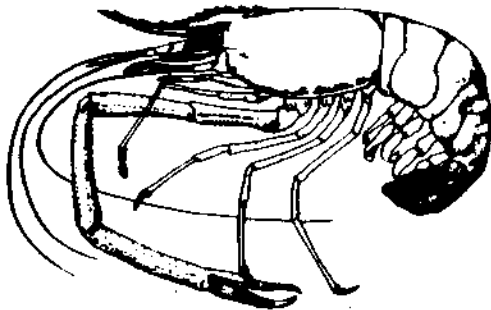
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MRTC-SGES

*Aquaculture
Technical Series*

**A New Floor-System for
Improved
Harvesting Efficiency in
Aquaculture**



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Sea Grant Depository

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INTRODUCTION

This pamphlet describes a harvest system that improves harvesting efficiency of some aquacultured species (e.g., freshwater prawns) by using a floor-net. The floor-net project was a cooperative effort of the University of Hawaii Sea Grant Extension Service and the University of Hawaii Agricultural Engineering Program.

BACKGROUND

Harvesting of the freshwater prawn *Macrobrachium rosenbergii* in Hawaii has been an inefficient and labor-intensive job. In the past, prawn-harvesting systems involved five to six workers who would drag a net through a stocked pond. At the end of the harvest, the two leading ends of the net were brought together and the trapped prawns collected. As the harvesters attempted to close the net, a large number of prawns would escape. This problem was compounded if the net lay across a tilapia hole, rock, footprint in the mud, or other pond-bottom irregularities. After the ends of the net were closed, harvesters would lift the net's lead-weighted line off the bottom, allowing more prawns to escape underneath.

A floor-net system was designed by UH researchers to alleviate the problems associated with prawn harvesting by:

1. Improving the ease of harvest;

2. Reducing the number of workers;
3. Reducing harvest time;
4. Facilitating the sorting of harvestable animals; and
5. Increasing harvest efficiency.

Findings indicate that finfish can be harvested using a similar system.

MATERIALS AND TOOLS

Harvest Net (Net that Moves Across the Pond)

24-by-140-ft net, 1-1/2 inch mesh, #9 twine, one-third basis (150 feet per 100 feet)

Floats (SB-6) placed at the top of the net, 9 inches apart. Floats are of 3-inch diameter, 3 inches long, and 11-ounce buoyancy.

3/8-inch polypropylene rope for top (float) line

Three 3/8-inch braided nylon ropes, running the length of the net for support at 6 inches and 14 inches from the top and 6 inches from the bottom

1 inch lead weight (about 250) spaced about 6 inches apart along the bottom of the net

Floor Net (Stationary Net)

6-by-160-ft net, 1-1/2 inch mesh, #9 twine

Floats same as for harvest net

Top (float) line same as for harvest net

Mud (bottom) line same as lead line for harvest net

Miscellaneous

25 to 30 4-ft wooden or bamboo stakes

Nets and baskets

4-inch diameter, 20 ft long PVC pipe, capped and sealed at both ends

PROCEDURE

Setting Up the Floor and Harvest Nets (Figure 1)

Place the floor net at the shallow end of the pond. Care should be taken when dragging the net into the pond. Drag net lead line first from shore. When net is in water, float line will be touching the pond shore. To secure net, manually push lead from lead line into the mud. If mud is soft, footprints in the mud will leave holes that the prawns can escape through and should be avoided. Grass and other aquatic plants in the pond and onshore will reduce harvesting efficiency and should be removed.

The harvest net should be placed in the deep end of the pond in the same manner as the floor net, with one exception. Do not push lead line into the mud. If the lead line does not reach the bottom of the pond, the water level is too high and animals will escape under the net during harvest. Lowering the pond water level the night before will solve this problem.

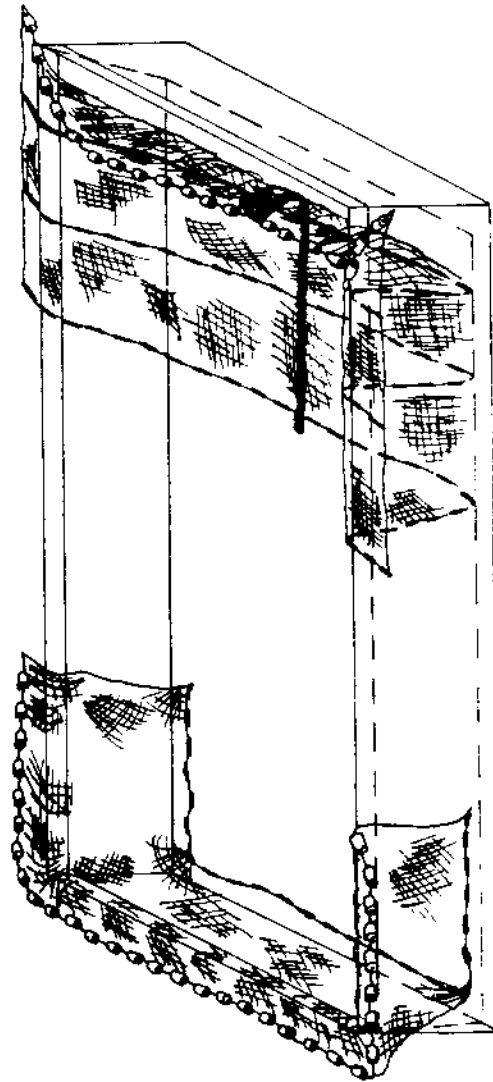


Figure 1. Setting up the floor and harvest nets

Using the Harvest Net (Figure 2)

Begin the harvest by having four workers walk the harvest net toward the shallow end, one person at each edge and two others in the middle of the net. All workers should wrap the lead line around one leg and drag the net. Never pull from the float line because this will lift the lead line off the bottom and the animals will escape. The two harvesters in the middle of the net must move along the net and take up any slack. Figure 2 shows the net with "peaks and valleys." The peaks are the leading edges of the net, where the people are pulling.

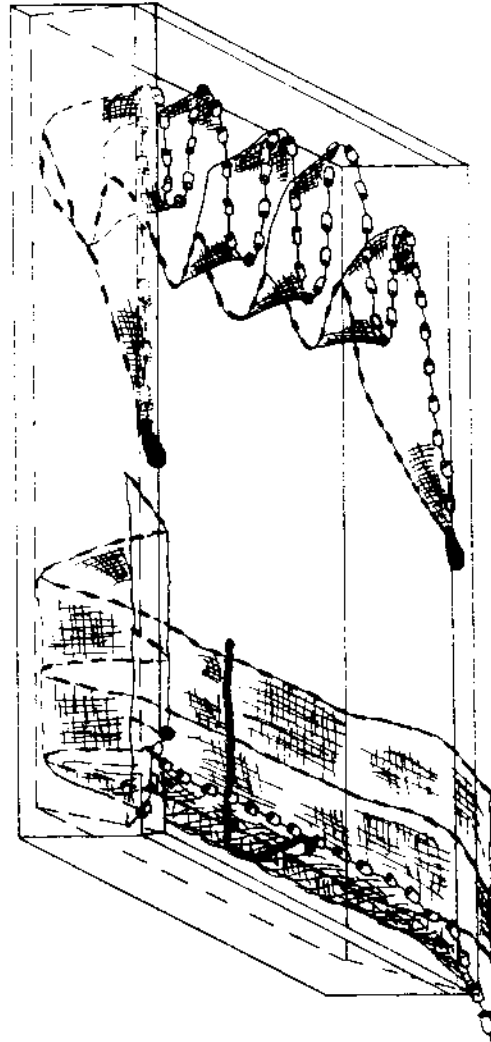


Figure 2. Using the harvest net

Positioning the Harvest Net Onto the Floor Net (Figure 3)

As the harvest net is dragged over the floor net, the lead weights of the harvest net could become entangled in the floor net. To prevent this, gently drag the harvest net over the floor net by slowing the rate of pull on the harvest net and by using hands instead of feet to pull the harvest net. Having the lead weights of the floor net pushed into the mud prior to the harvest is another way of preventing entanglement.

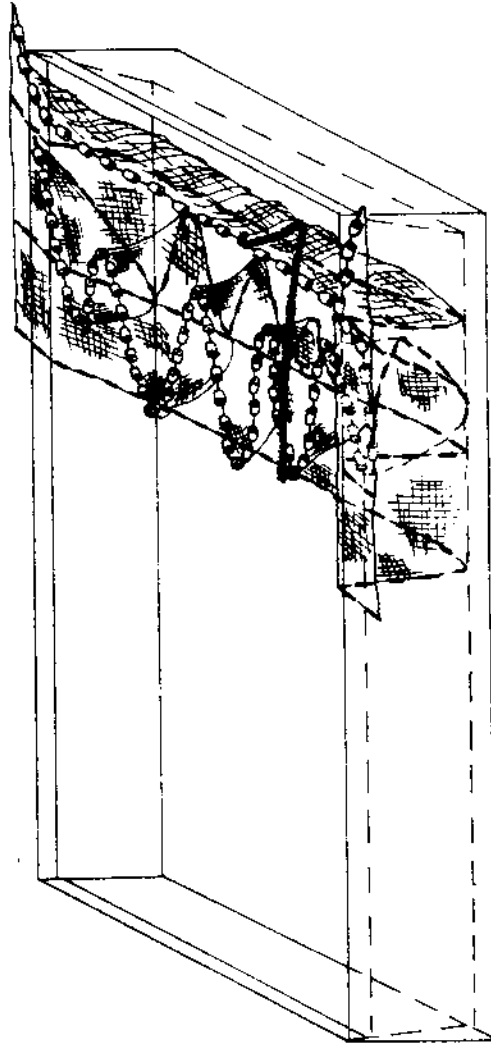


Figure 3. Positioning the harvest net onto the floor net

Staking the Floor Net (Figure 4)

Once the harvest net is on the floor net, movement of the harvest net can stop. Workers now must stake the floor net's lead line, removing it from the mud and lifting it section by section onto a stake. Make sure the stakes are firmly planted in the mud. Prawns and fish are now captured between the two nets. Animals that are not of harvestable size will escape between the large mesh of the net. Once the stakes are in place, the harvest net can be removed by lifting it over the floor net and onto the shore. The captured animals are now in the floor net between the stakes and the shore.

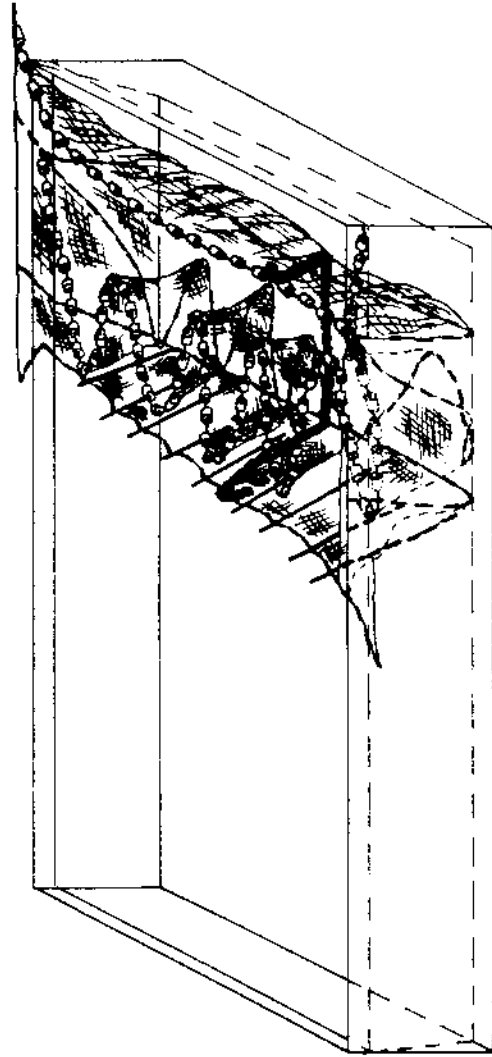


Figure 4. Staking the floor net

Using the PVC Pipe (Figure 5)

When the harvest net is removed, the capped PVC pipe can be placed underneath the floor net. The floating pipe is used to concentrate the prawns at one end of the net, which then eases removal from the pond. As the pipe nears the end of the net, workers can use buckets and handnets to remove the animals.

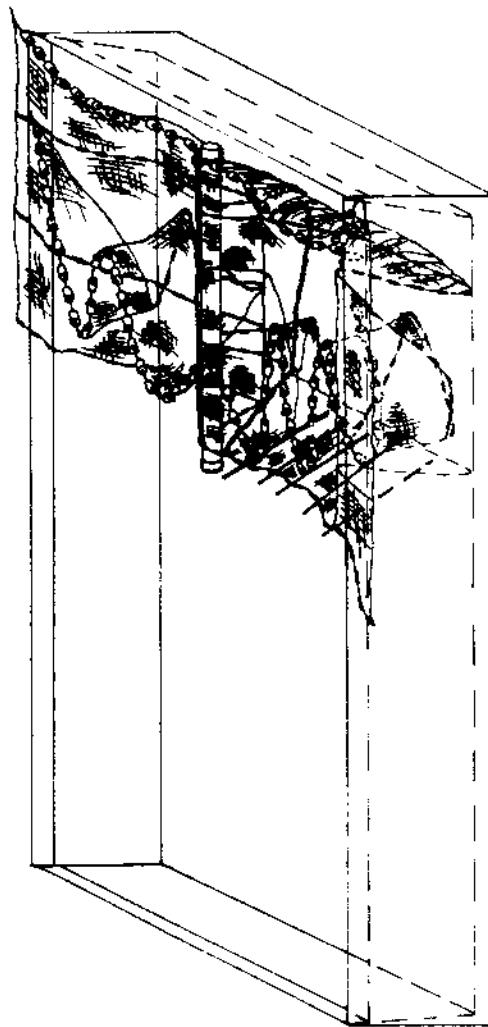


Figure 5. Using the PVC pipe

***Separating the Harvest Bag from Floor Net
(Figure 6)***

The original design of the floor net included two sections connected by a zipper. When the PVC pipe crossed under the zipper, the other portion of the net was disconnected and the remaining section with the prawns was lifted out of the water by a crane or pulley. This step is optional; most farms in Hawaii that use this technology do not remove the zipper.

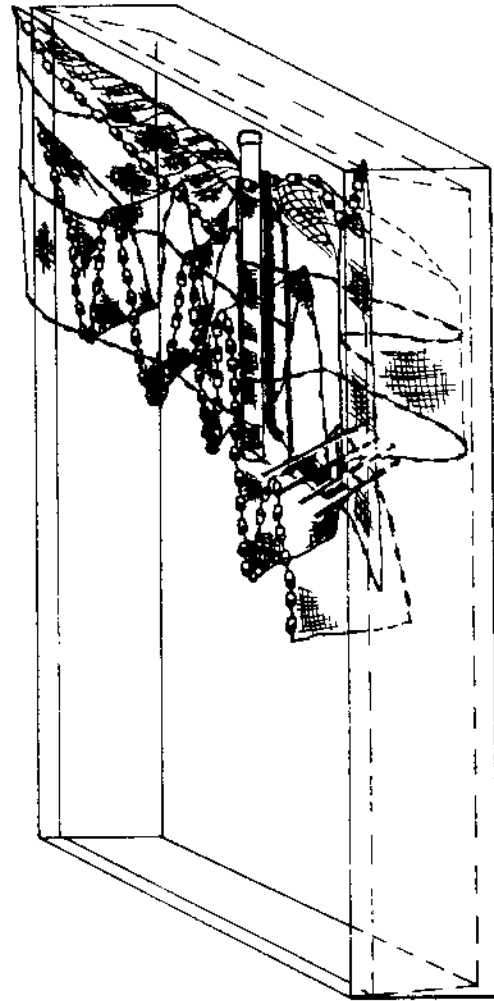


Figure 6. Separating the harvest bag from floor net

CONCLUSION

Improved harvesting efficiency is only one part of a successful aquafarm operation. Increasing stocking rates of juvenile prawns, sampling on a regular basis, and harvesting all lead to increased yields and knowledge about your pond. Weekly prawn sampling using a technique developed by researchers at the Hawaii Anuenue Fisheries Center (Figure 7) shows how to record data. Measurements of prawns are in centimeters from prawn eye stalk to telson (tip of tail). Tape recorders are used to record data while in the pond. The data can later be transcribed to data sheets.

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