

AN EVALUATION OF METHODS FOR DETERMINING  
MOVEMENTS OF SHRIMP

PHASE II - SHRIMP HOLDING STUDIES

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By: Gerald T. Lukas  
Fish Commission of Oregon

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INTRODUCTION

Successful laboratory rearing of adult pink shrimp (*Pandalus jordani*) requires a knowledge of the optimum conditions of factors such as shrimp density, water temperature and salinity. A one-year study by the Fish Commission at the Newport laboratory was conducted to establish criteria necessary to hold shrimp in aquariums at minimum mortality. The information gained from this study can be applied to both laboratory and field studies. The results will be reported in detail in a final report now in preparation. This annual report is presented as an interim summary only.

MATERIALS AND METHODS

The study was conducted in a control temperature room at the Newport laboratory. Pink shrimp were held in 18 fiberglass aquariums with a capacity of approximately 23-gallons each. A framework was constructed to hold three aquariums stacked one over the other. Each stack of three aquariums shared a common reservoir and filter. A submerged pump in the reservoir recirculated the salt water through the aquariums at a flow of 1.5-gallons per minute.

Live pink shrimp for the study were obtained from the trawl catches of commercial shrimp fishermen.

Two basic experiments were conducted during the laboratory study. The first was a test to determine survival at four different shrimp density levels. During the experiment, shrimp were held at a temperature and salinity which nearly matched natural conditions. The second experiment was designed to measure survival at three different salinity and temperature levels.

## RESULTS

The analysis of the density experiment indicated that there were no differences in survival after 30-days. The four levels of density tested were 13.6, 10.0, 6.5 and 3.3 shrimp per square foot.

One temperature-salinity test was completed. Shrimp were held at three different salinity levels (25,30, and 35<sup>o</sup>/oo) at a temperature of 44F. Temperatures ranged from 43-53F at various times during the test because of operating difficulties with the control temperature room. But for the most part, they were  $\pm 1^{\circ}$  of the set point temperature of 44F. Analysis of the results show that the shrimp held in 25<sup>o</sup>/oo salinity suffered a significantly greater mortality in the first five days than did shrimp at 30 and 35<sup>o</sup>/oo salinity. No significant differences in mortality occurred between day 6 and 20 for the shrimp held in the three salinity levels.

Problems which developed with the temperature controls in the control temperature room have prevented continuation of the temperature-salinity experiments. Two additional tests are planned and will be conducted when the control temperature room problems are solved.

## DISCUSSION

The two tests conducted thus far have provided basic information essential for maintenance of shrimp held in aquariums in the laboratory. Additional temperature-salinity tests are planned which will be useful for both laboratory and field studies. One test will be run at a temperature which matches maximum ocean surface temperatures found over the shrimp grounds.

The final report for shrimp holding studies will be written after the planned temperature-salinity tests are completed. Additional information regarding observations on shrimp behavior in the aquariums and feeding will be included in the final report.