Serfling, Steven A. June 1972. Recruitment, habitat preference, abundance, and growth of the puerulus and early juvenile stages of the California spiny lobster Panulirus interruptus (Randall). California State University, San Diego Master's Thesis.

ABSTRACT

Little is known about the early transitional and benthic life history stages of Panulirus interruptus or other spiny lobsters. The purpose of this study was to obtain basic ecological information about these important stages in order that their recruitment, survival, and growth might be better understood, and possibly improved, through habitat conservation and modification, and aquacultural methods. The problem was approached by three major lines of investigation conducted simultaneously.

Ecological and behavioral studies of the puerulus larval stage involved the development and testing of artificial and natural seaweed habitat traps, special paired neuston nets, and underwater night-lights for collecting and observing pueruli in nature. The results obtained indicate that pueruli first enter the coastal waters off San Diego during May, and continue to appear regularly through September, but with no apparent relationship to lunar or temperature cycles. Pueruli exhibit a strong attraction to floating habitat traps containing the seaweed Phyllospadix torreyi, and to bright lights at night. The results also suggest that the puerulus is a surface swimming pelagic form which actively seeks out intertidal areas for settlement and thereby functions in the recruitment of the preceding

phyllosoma stages to an area suitable for demersal life.

Studies of the habitat preference, distribution, and abundance of the early juvenile stages involved intertidal and subtidal searching and trapping in an attempt to locate and define the natural nursery grounds of the first and second year juvenile stages (< 40 mm Carapace Length). Juvenile stages larger than 42 mm C.L. were commonly seen in shallow rocky habitats with adult stages, but first and second year juveniles were extremely rare. One apparent nursery area of the early juvenile stages was located in a shallow surf grass habitat in a protected cove at Catalina Island. However, problems involved in sampling this typical habitat in other, less protected locations, made it difficult to determine if this is the primary nursery area for early juvenile stages.

Natural growth rates of the juvenile stages were determined by holding trials in live cages and aquaria, and estimated from shifts in size-frequency distributions of juveniles collected in nature. Results of these studies indicate that juveniles reach average sizes of approximately 22 and 44 mm C.L. after one and two years of growth, respectively.

Juveniles cultured at elevated temperatures in recirculating aquarium systems exhibited growth rates approximately 2.0 times greater at 23°C, and 3.1 times greater at 28°C, than estimated natural growth rates at ambient ocean temperatures. These higher rates were accomplished by reduced intermoult

periods rather than by greater increments per moult. Aquaculture of P. interruptus at elevated temperatures is feasible, but is impractical at this time because puerulus or post-puerulus stage individuals cannot be obtained in sufficient numbers from the field.