UNIVERSITY OF CALIFORNIA

SANTA CRUZ

CONCEPTUAL TOOLS FOR MANAGING TWO MONTEREY BAY FISHERIES

A thesis submitted in partial satisfaction
of the requirements for the degree of

MASTER OF SCIENCE

in

MARINE SCIENCES

by

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June 2003

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Conceptual tools for managing two Monterey Bay fisheries

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Abstract

I developed two conceptual models addressing fishery questions in the Monterey Bay motivated by 1) the California Market Squid (*Loligo opalescens*) and 2) marine reserves as a recovery and management tool. The model for California Market Squid incorporates the close ties between environmental variability and squid life history. Inclusion of environmental factors in the model provides a biological mechanism contributing to the large fluctuations that occur in the fishery. Furthermore, I predict that removal of 30% of the unspawned SSB may drive the population to extinction within 30 generations.

Reserves are generally agreed to be good for habitat and ecosystem conservation; however, specific measures of success, such as increases in yield or size at age have been difficult to generalize across reserves. I identify density dependent body growth and displaced fishing effort as potential explanations for the variable outcomes. I predict that density dependent body growth will reduce length at age inside reserves, even if mean length in the reserve increases. I also predict that although reserves increase yield, nothing maximizes yield as well as conservative fishing practices, and that displaced fishing effort decreases benefits of reserves, indicating the need to reduce effort, as well as create reserves.

Acknowledgements

This publication was supported in part by the National Sea Grant College Program of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration under NOAA Grant #NA06RG0142, project #R/F-186, through the California Sea Grant College Program; and in part by the California State Resources Agency. The views expressed herein do not necessarily reflect the views or any of those organizations.