

## **Fishing the spawning grounds of the California market squid**

### **Roger Hanlon**

Results of NURP-sponsored research on the behavior of the California market squid at their spawning grounds in Monterey Bay have recently been published in *Fishery Bulletin* and *Marine Biology* (references below). This nearshore fishery is under the management of the California Dept of Fish & Game, but that agency lacks resources for research. The study reported in this paper was conducted by Roger Hanlon (Marine Biological Laboratory, Woods Hole) and John Forsythe (National Resource Center for Cephalopods, Univ of Texas), with funding from the West Coast & Polar Regions Undersea Research Center (NOAA/NURP).

The California market squid (*Loligo opalescens*) is currently the target of the largest fishery on the U.S. West Coast (excluding Alaska), in terms of both weight and dollar value. These squid are fished directly on their nearshore spawning grounds. Management of this fishery is based on assumptions drawn largely from observations by commercial fishermen and television documentary filming. However, these assumptions have not been confirmed by systematic studies, and data on squid reproduction in other parts of the world suggests that some of them may be incorrect.

This study used remotely operated vehicles (ROVs) to collect systematic video data on the behavior of the market squid at their spawning grounds, both during the day and at night. Field operations were conducted in April-May 2000, Sept 2000, and August 2001. The observations clearly showed that normal mating and egg-laying behavior occurs only during the daytime, ending at dusk. This directly contradicts one of the longstanding assumptions about this species, that the squid are thought to spawn at night and therefore daytime fishing activity would not interfere with spawning and egg laying. This idea apparently arose because previous observations have been made at night using artificial lighting. Further, the study found that when mating and egg-laying concluded for the day, females appeared healthy and rejoined schooling groups, rather than becoming senescent or moribund as assumed.

#### References:

John Forsythe, Nuutti Kangas, and Roger T. Hanlon (2004): Does the California market squid (*Loligo opalescens*) spawn naturally during the day or at night? A note on the successful use of ROVs to obtain basic fisheries biology data. *Fisheries Bulletin*, **102**, pp. 389-392.

Roger T. Hanlon, Nuuti Kangas, and John W. Forsythe (2004): Egg-capsule deposition and how behavior interactions influence spawning rate in the squid *Loligo opalescens* in Monterey Bay, California. *Marine Biology*, **145**, pp. 923-930.

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