

Annual Report for YEAR 2 of MULTI-YEAR Project

“CRYPTIC DENSITY DEPENDENCE: THE EFFECTS OF SPATIAL, ONTOGENETIC, AND INDIVIDUAL VARIATION IN REEF FISH”

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PROGRESS REPORT: In 2004 (the second year of our multi-year research program), we completed analysis of otoliths and body condition (lipid, protein and carbohydrate composition) of approximately 100 juvenile six bar wrasse (*Thalassoma hardwicke*) collected in 2003. Results of this study were presented at the 10th International Coral Reef Symposium (Okinawa JP, July 2004), and are further summarized in two manuscripts submitted for publication in the Proceedings of this meeting (final copies will be submitted to the Gump Research Station as soon as they are available).

In addition, we continued monitoring patterns of settlement and mortality of juvenile *T. hardwicke* on approximately 200 patch reefs on the north shore of Moorea (for description of methods *see* Shima 1999, 2001a,b, Shima and Osenberg 2003). This sampling facilitated a continuous time series of demographic data for *T. hardwicke* spanning the primary reproductive/settlement season, from January to July 2004, and will be analysed in 2005-2006 to estimate the effects of habitat attributes on settlement and mortality rates.

In addition, we completed a set of surveys at 17 locations around the island to estimate spatial variation in density and reproductive patterns of adult *T. hardwicke*.

Lastly, we continued to develop collaborative links with researchers at CRIOBE, and completed a set of experiments with Dr David Lecchini (CRIOBE) to determine sensory abilities and habitat preferences of post-larval *T. hardwicke*.

As this is a multi-year research program, analyses of these activities is ongoing, and final results and conclusions await integration and synthesis with additional research activities planned for 2005-2007.

REFERENCES CITED:

- Shima, J.S. 1999. Variability in relative importance of determinants of reef fish recruitment. *Ecology Letters* 2:304-310.
- Shima, J.S. 2001a. Recruitment of tropical wrasse: Roles of larval supply, habitat availability, and post-settlement mortality. *Ecology* 82:2190-2199.
- Shima, J.S. 2001b. Regulation of local populations of a coral reef fish via joint effects of density- and number-dependent mortality. *Oecologia* 126:58-65.
- Shima, J.S. and C.W. Osenberg. 2003. Cryptic density dependence: effects of spatio-temporal covariation between density and site quality in reef fish. *Ecology* 84:46-52.