

## **COP Format for Annual Progress Report**

A: Grant Number: NA03NOS4260044 HCRI 6

B: Amount of Grant: \$39,000

C. Project Title: Post-settlement Life History of Key Coral Reef Fishes in a Hawaiian Marine Protected Area Network

D. Grantee: Dr. James Parrish, Jeremy Claisse

E. Award Period: From 1 Nov 03 to 31 Dec 04

F. Period Covered by this Report: From 31 Jun 04 to 31 Oct 04

### **G. Summary of Progress and Expenditures to Date:**

#### **1. Work Accomplishments:**

##### a. Summary of progress:

From November 2003 to the present, we have made bimonthly collections of each of the focal species from specific sites in West Hawaii. From these fish we removed samples of otoliths, gonads, and guts, recorded size, and determined sex.

70 *Zebrasoma flavescens*, 60 *Ctenochaetus strigosus*, and 50 *Acanthurus nigrofuscus* otoliths have been cut and prepared for age determination. We are still in the process of reading the otoliths, but preliminary results suggest high growth rates in the first 3 years of life, followed by slow growth, but great longevity (several *Zebrasoma flavescens* are apparently 20+ years old)

This spring we began a study of retention by our focal species of identification marks made by injection of elastomer material into fish held in pens at Coconut Island, Oahu. So far, most marks have lasted 150 days and counting. At the same time, we began a process for validating age estimates based on reading rings in otoliths by marking the otoliths of these same fish specimens using oxy-tetracycline. Later, the fish will be sacrificed, otolith rings counted, and counts compared with known approximate ages of specimens.

From 15 May 04 to 15 Aug 04 (corresponding to the usual major settlement period for the focal species), we conducted a full-time summer

field season in West Hawaii, based in Kona. We began monitoring settlement of postlarval fish on a nearly daily basis. We performed weekly surveys of transects through different habitats and depths to explore the types of habitats used by various sizes/ages of fish. We tagged and released 54 yellow tang at Ke'ei and 28 at Wawaloli using the elastomer injection technique, so that each individual can be visually identified. Sizes of tagged fish ranged from 6 to 15 cm. At a recent survey in October, we were able to identify 50 of these fish at Ke'ei and 20 at Wawaloli, indicating very high site fidelity and relatively low mortality (natural and/or tag induced).

b. Planned work:

Over the next quarter we will continue reading otoliths that we have processed and developing age/size curves for each of the species. We will begin to look at the effects that protection from aquarium collection produces on the age structures of the populations at our 4 collection sites.

We plan another trip to Kona in December to continue the field survey work and to begin recapturing and remeasuring individuals to get direct measurements of growth.

We will begin extensive analysis of data from the census surveys and from fish tagging from the summer field season.

## 2. Applications

- a. Made a presentation about the project's work to the West Hawaii Fisheries Council in February 2004. Attended subsequent Council meetings as resource people. Made quarterly public presentations at Hawaii Coral Reef Initiative Research Program meetings. At the request of HCRI, participated in a HCRI-RP public education/outreach event at Waikiki Aquarium, focused on problems of invasive marine species.
- b. It is too early to make recommendations for management, however our data are being supplied to Dr. Bill Walsh for use in the 5-year legislative review report that DAR is preparing on effects of FRAs.
- c. Data to date: (1) size, weight and sex data collected for almost 200 of each of the focal species; (2) 1 Jun through 15 Aug: weekly surveys of fixed transects and nearly daily surveys of newly settled fish at 2 locations in West Hawaii; (3) 82 individually identifiable tagged yellow tang currently in the field and surveys of their location, growth, retention/survival; (4) otoliths from 70 *Zebrasoma flavescens*, 60 *Ctenochaetus strigosus*, and 50 *Acanthurus nigrofuscus* collected, processed and ready to be read for the record for ageing/growth purposes.

d. Partnerships: Extensive collaboration with Hawaii Division of Aquatic Resources in West Hawaii. Yellow tang samples for DNA analysis given to Dr. Noakes (Washington State University). Gut samples supplied to Ryan Okano (UH Manoa, Dept. of Botany) for his diet study of yellow tang. Extensive collaboration with Dr. Howard Choat and his lab at James Cook University at Townsville, Australia regarding otolith processing and reading.

### **3. Expenditures**

- a. Scheduled expenditures as of 30 Sep 04 are approximately \$31,634., including labor costs, equipment and supplies, travel and subsistence, and miscellaneous field and lab expenses.
- b. Actual expenditures charged against the project closely match what was scheduled.