

The background of the slide is a deep blue color with a subtle, wavy texture that resembles the surface of the ocean. The text is centered and rendered in a bold, white, sans-serif font with a slight drop shadow for readability.

# **Post-settlement Life History of Key Coral Reef Fishes in a Hawaiian Marine Protected Area Network**

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# Background

- In West Hawai'i, the most heavily targeted fishes for the aquarium trade are herbivorous acanthurid species.
- These abundant species play a major role in maintaining the ecological integrity of the reef system. By controlling algal growth, they promote increased coral cover and diversity and may reduce the probability of harmful invasive algal invasions.
- The West Hawai'i Aquarium Project was created to begin a large-scale monitoring program of protected and unprotected sites along West Hawai'i, and has produced a wealth of fish abundance and recruitment data over the past 5 years.
- However research regarding the basic biology of these acanthurid species has been neglected relative to some other species that are either important commercial food fishes or especially convenient subjects for the study of population biology.
- Through discussions with Bill Walsh, Larry Basch, Dave Shafer and other researchers working in West Hawaii, we were able to identify 4 major areas of study that will provide a more complete understanding of post-settlement processes and the basic life histories for these important fish species. This information should lead to more effective management.

# Species and priority:

1) yellow tang *Zebrasoma flavescens*

- Largest ornamental fish catch



2) kole *Ctenochaetus strigosus*

- Medium to low catch



3) brown surgeonfish *Acanthurus nigrofuscus*

- Very low catch, if any



# Long-Term Project Goals

- (1) Determine age structure and growth rates
- (2) Explore patterns of post-settlement survivorship/mortality and post-settlement movement
- (3) Determine specific habitat use/requirements soon after settlement
- (4) Estimate age at first reproduction, fecundity and reproductive seasonality

# What we've done so far:

- Species selection, including initial feasibility checks for annual rings in otoliths & testing marking of individual fish
- Site selection for collections – 4 sites with different levels of protection
- Collection ~100 of each species from sites in West Hawaii
- Removal of samples of otoliths, gonads, and guts

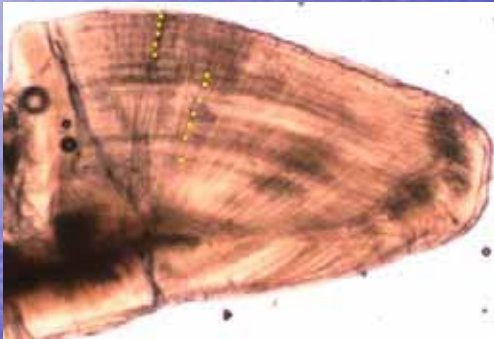
# Otolith annual rings:



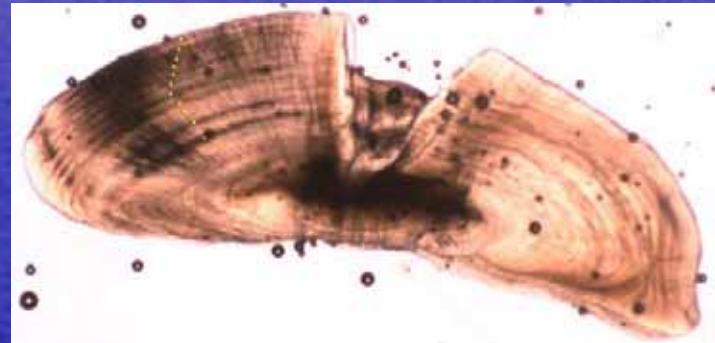
*Zebrasoma flavescens* 6 yrs



*Zebrasoma flavescens* 4 yrs



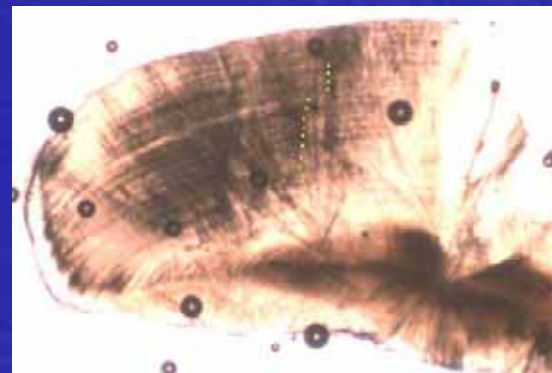
*Ctenochaetus strigosus* 12 yrs



*Ctenochaetus strigosus* 11 yrs



*Acanthurus nigrofuscus* 3 yrs



*Acanthurus nigrofuscus* 21 yrs

# What we plan to focus on over the next quarter:

- Otolith processing for aging
- Continue fish collections
- Start mark retention study and otolith annual ring validation at Coconut Island
- Training with aquarium collectors in Kona
- Presentation to West Hawaii Fisheries Council

# Acknowledgments:

Bill Walsh, Dave Shafer, Larry Basch, Howard Choat, Charles Birkeland, Dave Pence, Jan Dierking, Danielle Jayewardene, Brett Schumacher, Brent Carman, & John Coney.

EECB & HCFRU for initial funding