

## **JIMAR – PFRP ANNUAL REPORT FOR FY 2006**

P.I./Sponsor Name: Dr. Minling Pan, Pacific Islands Fisheries Science Center  
Associate P.I. Dr. Shichao Li, JIMAR, University of Hawaii

Project Proposal Title: Spatial Modeling of the Tradeoff between Sea Turtle Take  
Reduction and Economic Returns to the Hawaii Longline Fishery

Funding Agency: NOAA

NOAA Goal (Check those that apply):

- ☒ To protect, restore, and manage the use of coastal and ocean resources through ecosystem-base management
- ☐ To understand climate variability and change to enhance society's ability to plan and respond
- ☐ To serve society's needs for weather and water information
- ☐ To support the nation's commerce with information for safe, efficient, and environmentally sound transportation

### **1. Purpose of the Project (one paragraph)**

Construct a bio-economic modeling of multiple time-area closures to evaluate the tradeoff between sea turtle take reduction and economic returns to the Hawaii-based longline fishery. This bio-economic modeling of multiple time-area closures can be applied to protecting other endangered species and to managing bigeye / yellowfin tuna catch for the Hawaii longline fishery.

### **2. Progress during FY 2006 (One-two paragraphs, including a comparison of the actual accomplishments to the objectives established for the period, and the reasons for slippage if established objectives were not met):**

- Designed and programmed flexible and multiple time-area closures to allow the model to assess closures that are combinations of different areas (by one degree of latitude and/or longitude) and seasons (1 to 12 months) by specific set types;
- Applied regression statistics to identify the variables that significantly contribute to variable costs of longline fishing. Along with set type (deep set or shallow set), number of sets, length of vessels, and average distance of sets to ports significantly affect variable costs of each trip.

- Built a cost function into the model to measure the changes of net revenue to the fisheries under different closure options.

3. Plans for the next fiscal year (one paragraph):

- Run the refined sea turtle take General Additive Models with 12 year period (1994 to 2005) data while replacing three trip types (tuna, swordfish and mixed) with two set types in order to investigate the spatial and seasonal tradeoff between turtle take reduction and economic returns (in terms of net returns) before and after the new regulation;
- Select optimal closure scenarios from sorted simulations by “efficient frontier”;
- Evaluate economic impacts of potential regulatory options for the sea turtle take cap using the refined sea turtle take General Additive Models developed by the current project;
- Document the metadata for public access, data sharing with other PFRP projects, and the model modification; write JIMAR research report and peer-reviewed paper(s), and evaluate the possible application of the model to other protected species.

4. List of papers published in refereed journals during FY 2006.

N/A

5. Other papers, technical reports, meeting presentations, etc.

Li, S, Minling Pan, and Samuel G. Pooley. 2005. *Rethinking Time/Area Closure for Turtle Take Reductions – Tradeoff between Turtle Take Reductions and Economic Impacts*. Principal Investigators Workshop, November 14 – 15, 2005. University of Hawaii.

Li, S, Minling Pan, and Samuel G. Pooley. 2006. *Spatial Modeling of the tradeoff between Sea Turtle Take Reduction and Economic Returns to the Hawaii Longline Fishery*. 57<sup>th</sup> Tuna Conference, May 22-25, 2006. Lake Arrowhead, California.

6. Graduates (Names of students graduating with MS or PhD degrees during FY 2006.

Provide titles of their thesis or dissertation):

N/A

7. Awards (List awards given to JIMAR employees or to the project itself during the period):

N/A

8. Publication Count (Total count of publications for the reporting period and previous periods categorized by NOAA lead author and Institute (or subgrantee) lead author and whether it was peer-reviewed or non peer-reviewed (not including presentations):

	JL Lead Author			NOAA Lead Author			Other Lead Author		
	FY04	FY05	FY06	FY04	FY05	FY06	FY04	FY05	FY06
Peer-reviewed									
Non-peer reviewed									

9. Students and Post-docs (Number of students and post-docs that were associated with NOAA funded research. Please indicate if they received any NOAA funding. For institutes that award subcontracts, please include information from your subgrantees):

10. Personnel:

- (i) Number of employees by job title and terminal degree that received more than 50% support from NOAA, including visiting scientists (this information is not required from subgrantees):  
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- (ii) Number of employees/students that received 100% of their funding from an OAR laboratory and/or are located within that laboratory.  
N/A
- (iii) Number of employees/students that were hired by NOAA during the past year:

N/A

11. Images and Captions. (JIMAR will be including images in the annual report. Please send two of your best high-resolution, color images (photo, graphic, schematic) as a JPEG or TIFF with a caption for each image. Hardcopies of images can be dropped off at the JIMAR office if no electronic versions are available.



● Caption 1: Landings of Hawaii Longline Fishery at an Oahu Pier



● Caption 2: Oahu's Fish Auction Market, Hawaii