JIMAR – PFRP ANNUAL REPORT FOR FY 2007

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 model to explore tradeoffs between sea turtle take reductions and economic return for the Hawaii-based longline fishery. Through simulation analysis of multiple time and area closures, the study assesses possible policy options that allow fishing opportunity to be maximized without exceeding the caps on sea turtle interactions.

- 2. Progress during FY 2007 (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):
 - Developed a bio-economic model to explore tradeoffs between sea turtle take reductions and economic returns. Generalized Additive Models were applied to predict sea turtle interactions, and a cost function based on a regression analysis was built into the model to assess economic returns.
 - Preformed simulation analysis of time and area closures. The study assessed possible policy options that allow fishing opportunity to be maximized without exceeding the caps on sea turtle interactions. Several levels of fishing effort were

employed in the evaluations. The study provided a suite of feasible policy options for the management of the shallow-set Hawaii-based longline fishery that targets swordfish.

- Finished a draft of the technical report (for JIMAR publication) and a draft manuscript targeting journal publication. These drafts were under review and revision.
- 3. Plans for the next fiscal year (one paragraph):

The plan for FY2008 is to continue working on manuscripts for publications and to prepare new research proposal and apply for a new PFRP project regarding policy choices and impacts analysis under management of overfishing and climate change for the Hawaii-based longline fishery.

4. List of papers published in refereed journals during FY 2007.

N/A

- 5. Other papers, technical reports, meeting presentations, etc.
 - Li, S. and Pan, M. 2007. "Fishing Opportunities under the Sea Turtle Bycatch Caps using a Spatial Bio-economic Model for the Hawaii-based Longline Swordfish Fishery," Draft *Technical Report for JIMAR Contribution*.
 - Li, S. and Pan, M. 2007. Fishing opportunities under the sea turtle take cap using a spatial and temporal bio-economic model for the Hawaii-based longline swordfish fishery. 58th Tuna Conference, May 21-24, 2007. Lake Arrowhead, California.
 - Pan, M. and Li, S. 2007. Regulation designs in balancing the effectiveness in turtle avoidance and economic returns—a case study of the Hawaii-based longline swordfish fishery. CLIOTOP Working Group 5 Workshop "The Challenge of Change: Managing for Sustainability of Oceanic Top Predator Species" April 12-14, 2007. Marine Science Institute, University of California, Santa Barbara.
 - Li, S. and Pan, M. 2007. Evaluation of fishing opportunities under the sea turtle take caps using a spatial and temporal bioeconomic model – a case study for Hawaii swordfish fishery. North American Association of Fisheries Economists (NAAFE) Workshop, March 27-30, 2007, Universidad Marista de Mérida, Mexico.
 - Li, S., Pan, M. and Pooley, S. 2006. Fishing opportunities under the sea turtle take caps using a spatial and temporal bio-economic model PFRP Workshop, November 14 17, 2006. University of Hawaii.
 - Li, S., Pan, M. and Pooley, S. 2006. Fishing opportunities under the sea turtle take caps using a spatial bio-economic model for the Hawaii-based swordfish fishery. Internal report to *SSC Meeting*, October 3-5, 2006, Honolulu.

6. Graduates (Names of students graduating with MS or PhD degrees during FY 2007. 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):

	JI Lead Author			NOAA Lead Author			Other Lead Author		
	FY05	FY06	FY07	FY05	FY06	FY07	FY05	FY06	FY07
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):

N/A

- 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 of 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: Flow Diagram for Time and Area Closure Simulation Model

- Caption 2: A example of Trade-offs of sea turtle takes and economic returns under various policy alternatives
- 12. For multi-year projects, provide budget for the next year on a separate page. Contact Dodie Lau to confirm whether or not your project is to receive continuation funds (e.g., year 2, year 3), and for budget preparation assistance, <u>lau@hawaii.edu</u>