

JIMAR – PFRP ANNUAL REPORT FOR FY 2007

P.I./Sponsor Name: Heidi Dewar and Jeffry Polovina

Project Proposal Title: **Long-Term Deployment of Satellite Tags on Swordfish using the California Harpoon Fleet**

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) The objectives of this project are four-fold.

The management of swordfish in the Pacific is hampered by the lack of data on stock structure and essential habitat in part because of the difficulties associated with studying these large, active and aggressive fish. The goals of this project were 4 fold. First, to determine the feasibility of using the California harpoon fleet to deploy pop-up satellite tags over long time periods. To do this, tags were to be deployed over periods of up to 10 months. The second was to test the retention rates with two different dart types. The third to use any data obtained to determine whether the region off California is in fact a region of mixed as suggested previously and examine essential habitat is different oceanographic regions. Finally, given the diving patterns of swordfish and associated difficulty of using light to determine latitude and longitude efforts will focus on using hydrographic features to estimate locations between tag and pop-up.

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):

In the first year of the program nearly 50 % of the satellite tags deployed did not report which represents a high rate of failure especially in comparison to previous studies using the same methods. Consequently the PI's were reluctant to place more

tags in the water before trying to resolve the issue of low recovery rates. Low recovery rates have also been noted in other species who regularly dive into cold, deep waters such as thresher sharks and bigeye tuna. The low recovery rates for these species, including swordfish, may be associated with either the time spent in cold temperatures at high pressure or with the number of temperature and pressure fluctuations that the tags must endure.

To address the potential for technological limitations of the PAT tags due to the behavior of swordfish (descending at dawn and returning to the surface at dusk) the PI's worked with Wildlife Computers and Dan Costa at the University of Santa Cruz, a scientist specializing in tagging elephant seals. Elephant seals spend long periods of time at depth in the cold waters of the North Pacific on their annual migrations. This was considered to be a good proxy for swordfish behavior. In the winter of 2005-2006 three tags provided gratis by Wildlife Computers were deployed on 2 elephant seals. The two tags that were recovered after 5 months functioned perfectly unfortunately providing no insight into our high failure rates. Another potential problem may be recapture of tagged fish by the local driftgillnet fleet although with the \$500 reward in place this is unlikely. This year (see below) we plan to try shorter deployments to reduce the non-reporting rates. It was the longer deployments where the problems were apparent.

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

Over the next fiscal year we plan to deploy a total of 19 tags. This includes two tags remaining from last year and an additional 5 tags purchased with excess funding. This will bring the total to 35 tags including those provided as a match by the Tagging of Pacific Pelagic program. All tags will be set to release after 6 months to reduce problems with non-reporting. Half of the tags will be deployed at the beginning of the season in July and half at the end in October or November. For comparison of tag retention using the different dart types, 13 will be deployed with one dart type and 6 with the other to balance out the darts deployed in previous deployments. Once all data has been recovered (in spring of next year) a synthetic analysis will be conducted to determine the essential habitat of swordfish, geographic movement patterns and whether location estimates can be improved using hydrographic features. These results will be published in 2 companion papers.

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

0

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

The Ups and Downs of Swordfish and Satellite Tagging. PFRP annual meeting.

University of Hawaii. November 2006.

Movements and Behaviors of Swordfish in the Atlantic and Pacific Oceans. Annual IATTC Tuna Conference. May 2007. Lake Arrowhead CA.

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

Provide titles of their thesis or dissertation):

0

7. Awards (List awards given to JIMAR employees or to the project itself during the period): 0
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		
	FY05	FY06	FY07	FY05	FY06	FY07	FY05	FY06	FY07
Peer-reviewed									
Non-peer reviewed	1	1							

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):
0

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): 0
- (ii) Number of employees/students that received 100% of their funding from an OAR laboratory and/or are located within that laboratory. 0
- (iii) Number of employees/students that were hired by NOAA during the past year:
0

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:
- Caption 2: