

JIMAR ANNUAL REPORT FOR FY 2009

P.I./SPONSOR NAME: Kevin Weng, Tim Essington

NOAA OFFICE (Of the primary technical contract): NMFS, PIFSC

PROJECT PROPOSAL TITLE: Intraguild predation, cannibalism, and the productivity of tuna populations

FUNDING AGENCY: NOAA

NOAA GOAL (Check those that apply):

- To protect, restore, and manage the use of coastal and ocean resources through ecosystem-based 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

PURPOSE OF THE PROJECT (One paragraph): This project seeks to (1) construct a comprehensive database of the feeding habits of pelagic apex predators (2) use those data to identify the life history stages, locations and time periods when predation on commercially-valuable tuna is most pronounced (3) develop simple population models to gauge the impacts of predation on fisheries reference points.

PROGRESS DURING FY 2009 (One-two paragraphs, including a comparison of the actual accomplishments to the objectives established for the period, and the reasons for the slippage if established objectives were not met): We have completed the database and initial analysis of feeding habits data. An important component of the database is the inclusion of historical data from the 1950's and 1970's, not as data summaries but as raw data. This has dramatically increased our power to describe important predators on tunas, the sizes of tunas being consumed, and to evaluate the implications of changing predator fields on the productivity of tunas. We have found that bigeye tuna are rarely consumed by large fish (marlins, sharks, larger tunas) but that yellowfin and especially skipjack tuna comprise a significant component of the feeding habits of large bodied pelagic predators. Moreover, consumption is directed at body sizes that are near or exceed the size at recruitment, indicating that these predators may directly impact the productivity of these species. Finally, we have used these data to assess changes in the prey fields of tunas and other predators, using the fish as "biological samplers" that can provide an indicator of changes in prey communities. Notably, we find the first documented evidence for increasing cephalopod abundance over the four decades of data.

PLANS FOR THE NEXT FISCAL YEAR (One paragraph): We will finalize publications: at least two publications are planned for the next fiscal year. The first describes the magnitude and composition of tuna as prey in apex predator stomachs, the second uses tuna (principally yellowfin) and other large-bodied predators as samplers of the prey community to assess changes therein. Age and size-structured population models will be constructed thereafter to evaluate the extent to which fisheries reference points might be vulnerable to changes in apex predator biomass.

LIST OF PAPERS PUBLISHED IN REFERRED JOURNALS DURING FY 2009, in the following format: (Author or authors with last name and initials, publication year: Article title. *Journal name*, volume, page range.) For example: Charney, J.G., and A. Eliassen, 1964: On the growth of the hurricane depression. *J. Atmos. Sci.*, 21, 68-75.
None

OTHER PAPERS, TECHNICAL REPORTS, ETC.: none

GRADUATES (Names of students graduating with MS or PhD degrees during FY 2009; Titles of their Thesis or Dissertation): none completed during FY 2009

AWARDS (List awards given to JIMAR employees or to the project itself during the period):

PUBLICATION COUNT (Total count of publications for the reporting period and 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 |
|-------------------|----------------|------------------|-------------------|
| Peer Reviewed | 0 | 0 | 0 |
| Non-Peer Reviewed | 0 | 0 | 0 |

PERSONNEL:

For projects that awarded subcontracts in the fiscal year, please provide the number of supported postdocs and students from each subgrantee.

This project supported one Ph.D. student at the University of Washington

IMAGES AND CAPTIONS (We will also be including images for the annual report.

Please send two of your best high-resolution, color images (photo, graphic, schematic) as a **JPEG or TIFF (300 dpi)** with a caption for each image. If you do not have an electronic version of the image, a hardcopy version may be dropped off at the JIMAR office located in the Marine Sciences Building, Room 312):

No photos or images available at this time. We are preparing a piece for the PFRP newsletter currently and that may have some graphical content.