

JIMAR ANNUAL REPORT FOR FY 2008

P.I./SPONSOR NAME: Keith Bigelow, Mark Maunder, Adam Langley, Pascal Bach, John Sibert

NOAA OFFICE (Of the primary technical contact): Pacific Islands Fisheries Science Center

PROJECT PROPOSAL TITLE: Performance of Longline Catchability Models in Assessments of Pacific Highly Migratory Species

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):

The project will provide improved models of tuna and billfish resource abundance to the regional fisheries agencies (IATTC, NOAA Fisheries, NRIFS, SPC) or committees providing scientific advice to management bodies (ISC, Scientific Committee of the WCPFC). Standardized CPUE trends are highly influential in Pacific HMS assessments because the standardized trends represent the only indication of resource abundance in the absence of fishery independent indices. The removal of catchability and vulnerability effects will continue to be an important consideration in future Pacific HMS assessments. The project will develop improved longline catchability models for use in population assessments.

PROGRESS DURING FY 2008 (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):

The project proceeded with the research plan developed at the February 2007 workshop. A multispecies approach was conducted in collaboration with Japanese colleagues and presented to the annual PFRP workshop and a Billfish Working Group of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific. Two of the PIs (Bigelow/Maunder) published a paper on catchability comparisons

between depth and habitat which provided a corrective view on previous CPUE standardizations which naively assumed that catchability was depth-based.

One PI (Bach) and colleagues analyzed longline experiments within the ECOTAP program (F. Polynesia) and developed estimates of longline shoaling based on gear deployment strategies and oceanography. In particular, geometric forcing (*i.e.* transverse versus in-line) between current velocity and the longline set was shown for the first time from *in situ* experimental fishing data. The statistical habitat-based standardization model (statHBS) was distributed to four users/institutions during the fiscal year.

The project has one objective to merge the statHBS (ADMB) code with R-software in order to make the model more user friendly. There was little progress on this objective due to difficulties encountered in recruiting a scientific programmer.

PLANS FOR THE NEXT FISCAL YEAR (One paragraph):

The uncommitted balance (\$155k) will concentrate on three aspects during the next fiscal year: 1) continuation of a multispecies approach in a statistical framework to predict longline gear depth and standardized CPUE; 2) conducting fish population simulations and applying various CPUE standardization techniques; and 3) investigating the parameterization of the deep-scattering layer for bigeye tuna as an alternative to ambient temperature and oxygen in habitat-based approaches.

LIST OF PAPERS PUBLISHED IN REFERRED JOURNALS DURING FY 2008, 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.

Bigelow, K.A., and M.N. Maunder, 2007. Does habitat or depth influence catch rates of pelagic species? *CJFAS* 64:1581–1594.

OTHER PAPERS, TECHNICAL REPORTS, ETC.:

Bach, P., Gaertner, D., Menkes, C., Romanov, E., and Paulo Travassos, 2008. Effects of the gear deployment strategy and current shear on pelagic longline shoaling. Submitted to *Fish. Res.*

Kanaiwa, M., Bigelow, K., and K. Yokawa, 2008. A comparison of gear configuration and capture by hook, depth and habitat for Japanese training vessel and Hawaii-based tuna longline fisheries. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific/Billfish WG, ISC/08/BILLWG-1/03, 21 p.

Kanaiwa, M., Bigelow, K., and K. Yokawa, 2008. A comparison of observed catenary angles and estimated angles with a statistical habitat-based standardization model with a multiple species approach. International Scientific Committee for Tuna and

Tuna-Like Species in the North Pacific/Billfish WG, ISC/08/BILLWG-1/04, 17 p.

GRADUATES (Names of students graduating with MS or PhD degrees during FY 2008;
Titles of their Thesis or Dissertation): None

AWARDS (List awards given to JIMAR employees or to the project itself during the
period): None

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		1	
Non-Peer Reviewed			3

PERSONNEL:

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

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):

- Caption 1:

- Caption 2: