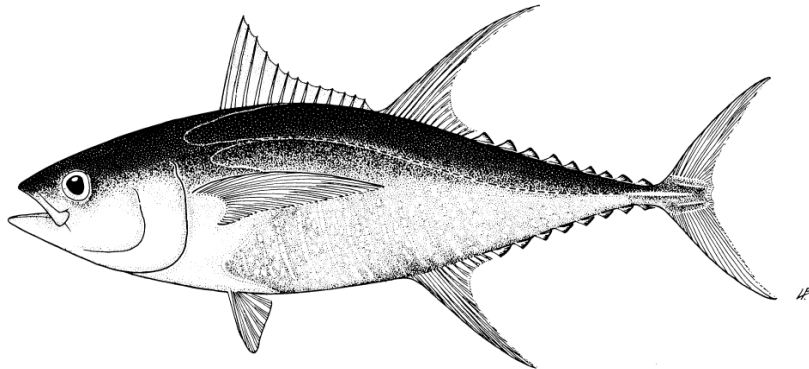


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Pelagic Fisheries Research Program

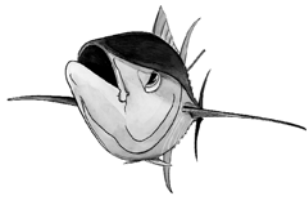
Program Overview and Current Research



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Pelagic Fisheries Research Program
Joint Institute of Marine and Atmospheric Research
University of Hawaii

June 2003



Pelagic Fisheries Research Program

Scientific Research in Support of Rational Fishery Management

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Background

The Pelagic Fisheries Research Program (PFRP) was established in 1992 at the time tunas, swordfish, and other “highly migratory” fish species were included in the Fisheries Conservation and Management Act. The mission of the PFRP is to conduct scientific research in support of rational fishery management policy. The PFRP augments the scientific information used by the Western Pacific Regional Fishery Management Council (WPRFMC) to formulate and administer fishery management plans.

The PFRP is a unit of the University of Hawaii’s Joint Institute for Marine and Atmospheric Research (JIMAR), one of eleven joint institutes¹ established in the United States by the National Oceanic and Atmospheric Administration (NOAA) to foster collaboration between academic scientists and NOAA. JIMAR was selected as the site for the PFRP because of its long and distinguished record of productive collaboration between University of Hawaii and NOAA’s National Marine Fisheries Service. The PFRP operates under the general direction of a Steering Committee composed of (1) Executive Director of WPRFMC, (2) Chair of the WPRFMC Scientific and Statistical Committee, (3) Dean of the UH School of Ocean and Earth Sciences and Technology, (4) Director of JIMAR, (5) Director of NMHS Honolulu Laboratory, and (6) Director of Fisheries Resources Division at NMFS Southwest Fisheries Science Center. The composition of Steering Committee assures that research sponsored by the PFRP is pertinent to WPRFMC priorities, meets highest scientific standards and is complementary to NMFS research programs. Day to day operation of the PFRP is the responsibility of a full time Program Manager.

Operations of the PFRP are considered by some to be a model of “best practice” for efficient and productive use of funds from congressional earmarks. Research projects are selected annually or biennially by a rigorous peer review process. The Steering

¹ <http://www.oar.noaa.gov/joints/joints.html>

Committee establishes research priorities which are circulated in a request for letters of intent. The Steering Committee reviews the letters of intent and invites full research proposals from selected letters. Each research proposal is reviewed by at least two independent scientists. The proposal reviews are further scrutinized by a three person panel of reviewers which then makes funding recommendations to the Steering Committee. Successful proposals are funded for periods of 1 to 3 years. Continuation of projects after their first year depends on evidence of satisfactory progress and availability of funds.

The PFRP funded its first research project in 1994. Since then, over seventy different research projects have been funded resulting in over scientific 250 publications, reports and conference presentations. The majority of these research projects have been conducted by scientists affiliated either with the University of Hawaii or the NMFS Honolulu Laboratory. In addition projects have been funded at ten different universities, two international organizations and in the private sector². The research disciplines include all major disciplines relevant to the management of fisheries for highly migratory species — biology, oceanography, statistics and modeling, and economic and social sciences. A list of current research projects can be found near the end of this document. The outsourcing model of operation as enabled the PFRP to operate for 10 years with an overhead of about 14% of the total budget.

² University of California, Bodega Marine Laboratory; College of William and Mary, Virginia Institute of Marine Science; University of Washington; Stanford University, Hopkins Marine Laboratory; University of Florida; University of Maryland; University of Montana; University of Guam; Queens University, Canada; Dalhousie University, Canada; PACMAR, Inc., Honolulu; SAIC, San Diego; Oceanic Fisheries Programme, Secretariat of the Pacific Community (Noumea); Inter-American Tuna Commission (La Jolla); Centre d'Ecologie Fonctionnelle et Evolutive, CNRS (France)

Current Projects

Biology

1. Describing the Vertical Habitat of Bigeye and Albacore Tunas and Post-Release Survival for Marlins in the Central Pacific Longline Fisheries with Pop-Up Archival Transmitting Tags PI: Jeffrey Polovina and Michael Seki
2. Ecological Characterization of American Samoa's Small-Scale Alia Albacore Longline Fishery PI: John Kaneko, Paul Batram and Elvin Mokoma
3. Evaluating Biochemical and Physiological Predictors of Long Term Survival in Released Pacific Blue Marlin Tagged with Pop-Up Satellite Archival Transmitters (PSATs) PI: Michael Musyl, Chris Moyes and Richard Brill
4. Instrumented Buoys as Autonomous Observatories of Pelagic Ecosystems PI: Kim Holland and Laurent Dagorn
5. Workshop on How to Improve Studies on the Collective Behavior of Pelagic Fish PI: Laurent Dagorn and Kim Holland
6. Distribution, Histories, and Recent Catch Trends with Six Fish Taxa Taken as Incidental Catch by the Hawai'i-Based Commercial Longline Fishery. PI: W. Walsh S. Pooley
7. Survivorship, migrations, and diving patterns of sea turtles released from commercial longline fishing gear, determined with pop-up satellite archival transmitters. PI: R. Brill G. Antonelis G. Balazs J. Polovina
8. Pop-Off Satellite Archival Tags to Chronicle the Survival and Movements of Blue Sharks following release from longline gear. PI: M. Musyl R. Brill
9. Developing Biochemical and Physiological Predictors of Long Term Survival in Released Blue Shark. PI: C. Moyes R. Brill M. Musyl
10. Trophic Ecology and Aggregation Behavior in Bigeye and Yellowfin Tuna in Hawaiian Waters. PI: K. Holland R. Young R. Brill L. Dagorn
11. Investigating the Life History and Ecology of Opah and Monchong in the North Pacific. PI: M. Seki

Sociology & Economics

12. A Sociological Baseline of Hawaii's Longline Fishery PI: Sam Pooley and Stewart Allen
13. Modeling Longline Effort Dynamics and Protected Species Interaction PI: PingSun Leung, Naresh Pradhan and Sam Pooley
14. Economic Fieldwork on Pelagic Fisheries in Hawaii. PI: S. Pooley
15. Regulatory Impact Analyses Framework for Hawaii Pelagic Fishery Management - a multilevel and multiobjective programming model. PI: X. Gu S. Pooley

Oceanography & Ecosystem

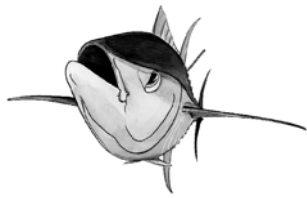
16. Trophic Structure and Tuna Movement in the Cold Tongue-Warm Pool Pelagic Ecosystem of the Equatorial Pacific PI: Valerie Allain, Robert Olson, Felipe Galvan Magana and Brian Popp
17. Oceanographic Characterization of the American Samoa Longline Fishing Grounds for Albacore, *Thunnus alalunga* PI: Michael Seki and Jeffrey Polovina
18. The Role of Oceanography in Bigeye Tuna Aggregation and Vulnerability in the Hawaii Longline Fishery from Satellite, Moored and Shipboard Time Series. PI: J. Polovina R. Brainard B. Qiu M. Seki P. Flament
19. Development of Oceanographic Atlases for Fisheries and Resource Management of the Exclusive Economic Zones of the U.S. Pacific Islands. PI: R. Brainard D. Foley J. Sibert

Protected Species

20. A General Bayesian Integrated Population Dynamics Model for Protected Species PI: Mark Maunder
21. Integrated Statistical Model for Hawaiian Albatross Populations PI: Daniel Goodman and Jean-Dominique Lebreton
22. Development of a Hierarchical Model to Estimate Sea Turtle Rookery Contributions to Mixed Stocks in Foraging Habitats PI: Ben Bolker, Karen Bjorndal and Alan Bolten
23. Direct Tests of the Efficacy of Bait and Gear Modifications for Reducing Interactions of Sea Turtles with Longline Fishing Gear in Costa Rica PI: Yonat Swimmer

Statistics & Modeling

24. Mixed-Resolution Models for Investigating Individual to Population Scale Spatial Dynamics. PI: Patrick Lehodey, Jeffrey Polovina, David Kirby and Raghu Murtugudde
25. Comparisons of Catch Rates for Target and Incidentally Taken Fishes in Widely Separated Areas of the Pacific Ocean PI: William A. Walsh and Sam Pooley
26. Causes of Rapid Declines in World Billfish Catch Rates. PI: Ransom Myers and Peter Ward
27. Recreational Fisheries Meta Analysis - Preliminary Steps. PI: P. Dalzell S. Pooley
28. Incorporating oceanographic data in stock assessments of blue sharks and other species incidentally caught in the Hawaii-based longline fishery. PI: P. Kleiber



Pelagic Fisheries Research Program

Request for Proposals

June 23, 2003

The Pelagic Fisheries Research Program (PFRP) sponsors research on pelagic fisheries to provide the Western Pacific Regional Fishery Management Council (WPRFMC) with scientific information to support development of optimal management policies for fisheries for tunas and billfish in Hawaii, American Samoa, Guam, and Commonwealth of the Northern Mariana Islands. The PFRP is soliciting letters of intent to submit proposals to conduct research on pelagic fisheries in this region. Total funds to be awarded are likely to be approximately \$1,000,000. Individual awards may be as large as \$200,000, but higher awards can be made to support projects of exceptional quality.

The PFRP is soliciting letters of intent to conduct research on all subjects relevant to the management of pelagic fisheries and specifically emphasizes the following four general areas of research:

1. Ecosystem-based fishery management

Ecosystem-based fishery management is has been widely promoted by fishery management agencies and NGOs and will soon be the preferred mode of fishery management. However, most current discussions of ecosystem-based fishery management are rather vague and offer little guidance for development of policies that can be practically applied to the management of pelagic species. Humans are essential constituents of fisheries ecosystems. Understanding of the of dependencies between human systems and the natural production systems of the oceans is essential for development of effective ecosystem-based fishery management.

Pelagic fisheries in Hawaii exploit a large number of species (4 tunas, 2 marlins, swordfish, mahi mahi, opah, monchong, ono), and incidentally catch 4 species of turtles and 2 species of albatross. These animals appear to occupy higher trophic levels in the surface-pelagic ecosystem, and many of the current controversies be attributed to this fact. PFRP has sponsored projects that addresses the biology and stock dynamics of several and incidental catch species, natural production systems that support the exploited populations, and the revenue produced by the aggregate catch.

Further work is required in the areas of **ecosystem modeling, policy development, trophodynamics, and dynamics fishing communities** to support development of comprehensive ecosystem-based management policies for fisheries in the surface pelagic ecosystem.

Some specific topics of interest include:

- a. “Data rescue”, discovery, verification, and documentation of long-term data sets pertaining to fisheries for pelagic species. Preference will be given to historical data sets extending to the time period prior to 1940 and to data sets relevant to fisheries for large pelagic species.
 - b. Analysis of long-term (≥ 50 years) data on fisheries for pelagic species.
 - c. Development and application of statistical models for multi-species fisheries with preliminary emphasis on the well-documented and verified data from the Hawaii longline fishery.
 - d. Development of operational metrics of ecosystem performance and condition.
 - e. Social and economic aspects dimensions of ecosystem-based fishery management and the impact of variation in fisheries production, whether do to changes in fish populations or to changes in fisheries regulations, on fishing communities.
 - f. Identification of practical policies for implementing ecosystem-based fisheries management for pelagic fisheries. What might work? What might not work?
 - g. The effects of improved fish handling on reduction of by-catch and discards.
 - h. Potential application of LIDAR technologies to enumeration of prey density for pelagic species.
2. Integrated statistical models of protected species population dynamics

The impacts of interactions between fishing operations and protected species have reached the point where sustainability of fisheries depends on quantitative assessment of the effects of specific fishing operations on the dynamics of protected species populations. Such assessments are problematical for most protected species using currently available population models.

- a. Integrated statistical models for North Pacific loggerhead sea turtle populations. At a minimum such a model would integrate data from nesting beaches, from tagging (both conventional and electronic) studies, and on encounter rates with the Hawaii longline fleet and would provide statistical estimates with uncertainty measures of all population dynamics parameters. Applicants will need to demonstrate the ability to develop a collaborative research project with the relevant data holders.
 - b. Collaborative assembly of stock-wide data bases for other marine turtle populations.
3. Dynamics of tuna aggregation.

Aggregation is a continuing priority for the PFRP. Approximately 80% of the Pacific catch of skipjack, yellowfin and bigeye tuna is obtained from aggregations of fish around floating objects, yet little is known about the relationships between stock dynamics and aggregation. Current PFRP research in this field exploits unique features of Hawaii as a “natural laboratory” for the study of aggregation and emphasizes trophic

considerations in different type of aggregation. The PFRP is seeking to extend these studies to both drifting and moored FADs in the equatorial tuna fisheries in the Pacific.

Application Process

- c. Interested specialists should submit a letter of intent to prepare a proposal by **August 8, 2003**. The letter should be no more than five pages long, should contain a brief description of the work to be proposed, and an estimate of its approximate cost. Annual costs of projects can be as high as \$200,000, but higher costs will be considered for exceptional projects. Proposals for projects expected to extend for several are welcome, but funds can only be allocated on an annual basis. Such projects should be structured to ensure that measurable results are presented on an annual basis.
- d. The PFRP Steering Committee will review the letters of intent for relevance to PFRP and WPRFMC priorities. Certain research projects will be selected and the authors will be invited to prepare full proposals.
- e. Research proposals will be sent out for peer review.
- f. A special panel will be convened to review the research proposals and peer review comments, and to make funding recommendations to the PFRP Steering Committee.
- g. Final decisions on awards will be taken in October, 2003.

Applicants must transmit letters of intent electronically in “pdf” format. Correspondence should be addressed to the PFRP Program Manager, Dr. John Sibert, Joint Institute for Marine and Atmospheric Research, School of Ocean and Earth Science and Technology, University of Hawaii at Manoa, 1000 Pope Road, Honolulu, HI 96822, email sibert@hawaii.edu

Further Information

The PFRP is currently sponsoring research projects on the biology of tunas and billfishes, on the oceanographic environment of pelagic fish, on the influence of environment on fishery performance, and on social and economic factors influencing fisheries. A list of projects supported by the PFRP, publications and other information can be obtained from the PFRP web <http://imina.soest.hawaii.edu/PFRP/>