

JIMAR ANNUAL REPORT FOR FY 2000
(Project 653540)

PROJECT TITLE: **Analyzing the Technical and Economic Structure of Hawaii's Pelagic Fishery**

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1. Purpose of Project

The main objective of the proposed study is to determine the technological and economic interrelationships in Hawaii-based longline, troll, and handline pelagic fisheries using a multi-product dual revenue function approach. A secondary objective is to provide a preliminary test of incorporating these estimated relations into the existing allocation model. The specific objectives of the project include:

1. Compile existing secondary trip-level information on revenue, landings and prices by species as well as other trip characteristics, including trip lengths, seasonality, and target for Hawaii-based longline, troll, and handline pelagic fisheries contained in NMFS logbook and HDAR (Hawaii Division of Aquatic Resources) catch records;
2. Conceptualize and specify multi-product dual revenue function models longline and troll/handline fisheries and develop their estimation procedures;
3. Test for input-output separability and non-jointness-in-inputs of the harvesting technology of Hawaii-based longline, troll, and handline pelagic fisheries;
4. Estimate own and cross-price supply and effort elasticities;
5. Estimate the multi-species economies of scope, species-specific economies of scale, multi-species economies of scale, species-specific marginal costs and cost elasticities;
6. Assess the impact of area-closure by conducting separate analyses of the data collected before and after the implementation of area-closure regime and comparing the estimates for the two periods; and
7. Incorporate the estimated relations into the existing mathematical programming allocation model as a demonstration on how the estimated relations can be used.

2. Progress during FY 2000

Most of project work during 2000 is related to collection, compilation and organization of necessary data for the study. NMFS logbook and HDAR catch records are the key sources

of data for the longline fishery. However for other commercial pelagic fisheries (handline and troll), HDAR data is the only source of information. The NMFS logbook provides information on fishing effort (such as trip length, number of sets, number of hooks, light sticks, etc.) and environmental factors (temperature, wind speed, longitude, latitude, etc.), while the HDAR data provides information on total pounds of fish caught and sold and revenue by species. Besides these data, additional vessel-specific information for longline vessels (such as tonnage, horsepower, size, etc.) are obtained from the data maintained by the U.S. Coastguard.

Since the necessary data for the longline fishery come from two different sources, most of work so far has focused toward merging the two datasets. The HDAR data (pounds of fish sold/caught and revenues) are basically maintained at the trip level, while NMFS logbook provide data at the set level. Therefore, the initial task involved the transformation of the logbook data from set level to trip level. Then the data from the two sources were combined based on vessel name, permit number, the hauling date of last set, and the date of submission of catch records to HDAR. For the period from 1991 to 1998, the total trip-level longline observations in the NMFS logbook and HDAR datasets were 10,597 and 8,618, respectively of which we are able to match 6,666 (i.e., respectively about 77% and 63% of total observations). Reasons for not matching include underreporting, combining multiple trips when reporting to HDAR, and entry of wrong vessel names. With this, almost 80% of data preparation work for the longline fishery has been completed.

The HDAR data for the non-longline pelagic fisheries (troll and handline) have also been obtained. As soon as the data preparation for the longline is finished, we will start working on the non-longline data.

3. Work Plan for the Next Fiscal Year

1. Complete data compilation for both longline and non-longline fleets and conduct some descriptive analysis for data reliability and consistency;
2. Identify and estimate variables (such as fishing effort and the number of species) in the revenue function and specify and estimate the revenue function model separately for longline and non-longline gears and for different targets;
3. Test for input-output separability and non-jointness-in-inputs of the harvesting technology of Hawaii-based longline, troll, and handline pelagic fisheries;
4. Estimate own and cross-price supply and effort elasticities;
5. Estimate the multi-species economies of scope, species-specific economies of scale, multi-species economies of scale, species-specific marginal costs and cost elasticities; and
6. Report write-up, including preparation of one or two articles for journals and international conferences.