

# RECENT DEVELOPMENTS IN PERUVIAN FISHERIES

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The Peruvian fishery for anchoveta (*Engraulis ringens*) is the world's largest by weight. Annual publications of the Food and Agriculture Organization of the United Nations (FAO) contain the landing statistics. International oceanographic expeditions have studied and reported biological and physical aspects of the rich upwelling area off Peru, which provides the plankton diet of anchoveta.

Most non-FAO publications on this fishery are in Spanish. Also, the distribution of material to libraries in the northern hemisphere is limited, and distribution of certain FAO working documents is necessarily restricted. These facts serve to reduce availability of information.

In June 1970, I completed a 1-year tour with FAO at the Instituto del Mar del Peru, in Lima's seaport of Callao. I have selected for this article some recent, reportable general developments in Peruvian fisheries.

## ANCHOVETA

Strong recruitment of this species was evident by early December 1969. High catches--sometimes exceeding 300,000 metric tons weekly--characterized the last half of the 1969-70 season. Official landing statistics await publication but will be on the order of 11 million metric tons. Other species also enter the meal plants: in one atypical case, I observed a set of 50 tons estimated to be 20% "pejerrey," an atherinid normally caught for table food by inshore gillnetters.

The seiners, many with a hold capacity of 350 tons and with even larger ones now being built (Commercial Fisheries Review, 1969), can be filled under ideal conditions from a single set. Typically, the catches are pumped into barges anchored offshore because the beach is shallow and Peru has few harbors. In turn, huge volumes of fish and water are pumped ashore where the fish are weighed and processed.

Considerable differences between plant layout and the high costs of installing magnets or more sophisticated equipment--efficient

enough to recover reasonably high proportions of internal tags from the high volumes processed--greatly complicate early prospects for quantitative tagging experiments. In August 1970, however, the first coastwide release of tagged fish (about 200,000) was nearly complete under Peruvian/FAO cooperation. The objective is to find preliminary information on the degree of intermingling between fish from different areas to help decide if the major northern (Chimbote) and central (Callao-Pisco) parts of the stock should be managed as a single unit.

Fishing occurs year round in the far southern area off Ilo and Mollendo near Chile; this area contributes less than 10% of total landings. The other areas typically have a closure of about 2 months (usually July-August, but mid-May to August in 1970). In addition, shorter and earlier closures have been enforced the past few years to take better economic and biological advantage of an apparent excess of growth over natural mortality for fish shorter than 12 cm.; recruitment commences on fish about 7.5 cm. long. In connection with these closures and a general weekend shutdown, management is based

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mainly on quotas derived from scientific investigation. To improve overall economic efficiency, it is possible that plant quotas on meal production also will be introduced beginning September 1 for the 1970-71 season.

The population of guano birds competes with man for the resource. It has rebounded slowly since the drastic southward incursion of warm tropical waters, or El Niño, along the Ecuador-Peru coast during early 1965 (Bjerknes, 1966, Figure 5d; Quinn and Burt, 1970). The bird population was below 5 million in December 1969, down from over 25 million estimated from past censuses before fishery blossomed (personal communication with Dr. R. Jordán, Instituto del Mar del Peru). About 11 tons of anchoveta are required to produce a ton of guano (bird droppings) and about 6 to yield a ton of higher-priced fishmeal. Therein lie a host of fascinating biological and economic problems of great interest to Peruvian, FAO, and other investigators, and to naturalists. Economists point out that fishmeal is second only to copper in generating income to Peru--nearly \$250 million annually. The penalty for killing a guano bird still is severe; it was capital punishment during Inca days.

#### TABLE FISH

Perhaps the most striking economic feature of Peruvian table fish is the high ratio of retail to wholesale prices--often 5 or 10 to 1. The greatest potential and present pro-

duction is off northern and north-central Peru, where the 100-meter depth curve is farthest from the arid, sandy coastline. Some 75 species are landed--about 30 each month of the year. Bonito are the most important in both landed weight and value. More efficient and cheaper methods of harvesting, processing, transporting, and selling are being sought actively under a new Peruvian FAO marketing project.

Increased capture and better utilization of table fish is of special interest to the Ministry of Fisheries, which went into effect during February 1970. Its director, General Tantaléan, has ambitious plans. For example, the Danish government already has contracted to build 12 new freezer plants. Still uncertain following the devastating earthquake of May 31, 1970, however, is the extent to which plans for fisheries and other sectors can be implemented on an acceptable schedule to provide more protein and income for Peru's 13 million people.

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