

THE SOUTH PACIFIC LONG-LINE FISHERY FOR ALBACORE TUNA, 1954-64

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ABSTRACT

This report presents a brief history and the present status of the South Pacific tuna long-line fishery based in American Samoa. From a modest beginning with a fleet of only 7 Japanese long-line vessels, this fishery has grown steadily, and by 1963 it comprised about 100 vessels from Japan, Republic of Korea, and the Republic of China. The annual landings of albacore tuna, the principal species caught, increased from 744,500 pounds in 1954 to 30 million pounds in 1963. The catch declined in 1964 to 23.5 million pounds, owing to the combined effects of a decrease in catch per effort and a drop in fishing effort. Preliminary analysis suggests that the entrance of a strong year-class in early 1964 has contributed in large part to the decline in catch (by weight) per unit of effort in 1964.

In 1949, a small cannery was built on the north shore of Pago Pago Bay, Tutuila Island, American Samoa. Except for two trial runs, the cannery was never operated, owing to the failure of attempts to supply it with tuna by live-bait fishing and purse seining in the surrounding waters. The U. S. Department of the Interior subsequently purchased the plant and offered the cannery for lease. In 1953, a California tuna-packing firm bid for and obtained a lease on the plant with an option to renew it. (Van Campen 1954. "Tuna fishing at American Samoa, January-April 1954.") This transaction marked the beginning of the tuna fishery in American Samoa and the beginning of a South Pacific long-line fishery for albacore. In January 1954, seven Japanese tuna vessels began long-line fishing around American Samoa to supply tuna to this cannery. In 1963, a second California tuna-packing company began canning tuna in American Samoa.

Starting with a modest fleet of 7 long-liners in 1954, the operation grew steadily and by the latter part of 1958, a total of 30 long-line fishing vessels was based at American Samoa. The number of vessels reached a peak in 1963, when about 100 vessels were operating. As of December 1964, a total of 68 vessels was operating in this fishery.

The composition of the fishing fleet, in terms of the country of origin of the vessels, has changed over the years. In the early years of the fishery, the fleet was composed entirely of long-liners from Japan. In 1962, vessels from the Republic of Korea began operating in the area and in 1964, vessels from the Republic of China joined the fleet. The 68-vessel fleet operating in December 1964 was composed of 40 vessels from Japan, 17 from the Republic of Korea, and 11 from the Republic of China.

Because of the very rapid development of this fishery, a data-collecting system was established to monitor the effects of the fishery on the resource. Through the cooperation of Governor H. Rex Lee of the Government of American Samoa, the Samoa Department of Agriculture and the tuna-processing industries, a field station was established in April 1963. Manned by personnel from the U. S. Bureau of Commercial Fisheries Biological Laboratory Honolulu, Hawaii, the field station is effective not only in conducting biological sampling of catches, but also in obtaining catch and operational data from vessel operators who deliver their catches to the canneries. This report is partially based on data obtained through this field station.

The geographical expansion of the fishery is illustrated in figure 1. At the outset of the fishery in 1954, the vessels fished relatively close to American Samoa in an area of approximately 100,000 square miles. By 1956, considerable fishing already took place as far south as latitude 28° S., in waters southeast of the Tonga Islands. The greatest expansion of fishing grounds was in 1958, however, when vessels extended fishing eastward to the vicinity of the

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Note: This article is part of a more comprehensive report being prepared on the American Samoa-based fishery.

Marquesas Islands. Presently, the vessels are fishing in an extensive area from the Equator in the north to as far south as 30° S., and from about 175° E. longitude in the west to as far east as longitude 120° W., or an area of about 8 million square miles. Vessels fish as far as 3,000 nautical miles from their base.

Except for the first few years, when yellowfin tuna dominated the catch, albacore has been the predominant species in the catch. Albacore tuna are being delivered to the canneries in a ratio of about 4:1 by weight over yellowfin. Among the tunas, albacore usually commands the highest price. In American Samoa, commercial fishermen have geared their effort towards catching that tuna species. Fishing grounds are selected where albacore are most plentiful and not necessarily where the greatest aggregate total of tuna of all species can be caught.

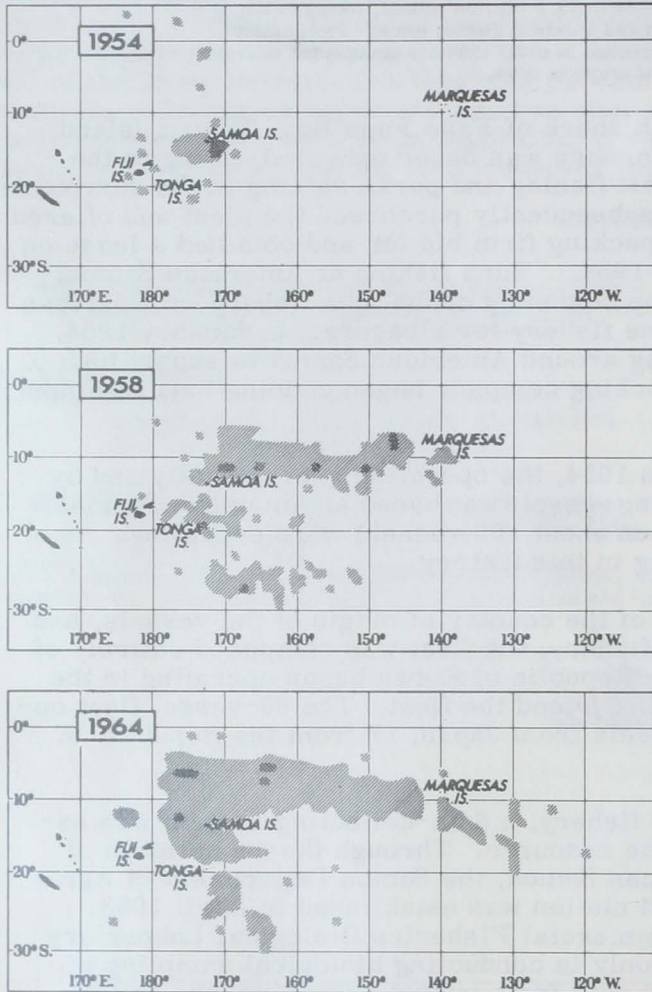


Fig. 1 - Locations fished by vessels from American Samoa, 1954, 1958, and 1964

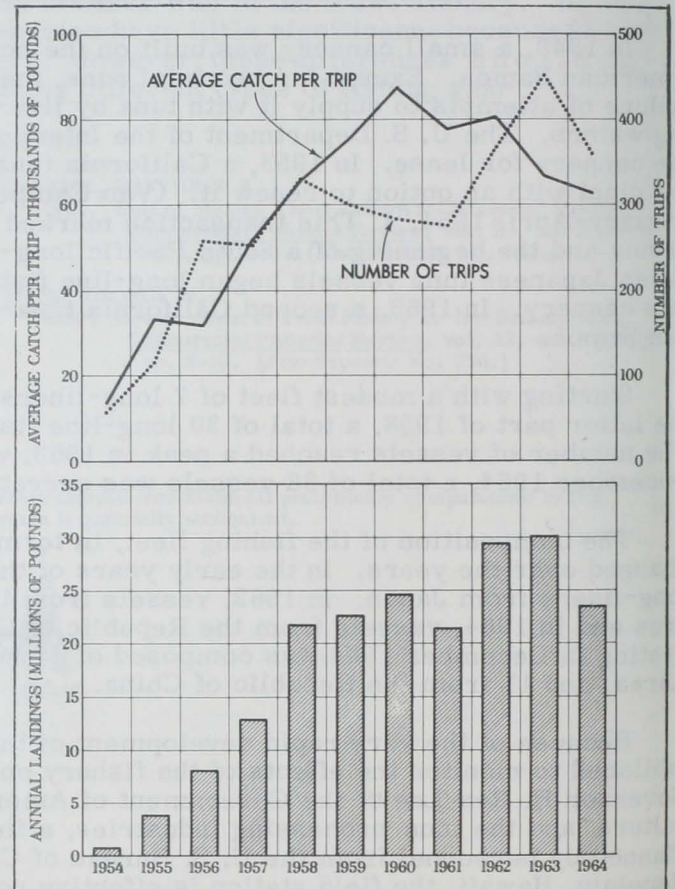


Fig. 2 - Annual albacore landings, annual total number of fishing trips, and average albacore catch per trip by vessels based in American Samoa, 1954-64.

The total annual landings of albacore tuna by vessels based in American Samoa, the total number of fishing trips made each year, and the average catch of albacore per fishing trip are shown in figure 2. (Note: Albacore landings data are based on date of capture rather than on date of delivery and may therefore disagree slightly with other published statistics.) The annual catch of albacore increased steadily since the start of the fishery, from 744,500 pounds in 1954 to 30 million pounds in 1963. In 1964, the catch declined to 23 million pounds. In general, the annual landings have tended to fluctuate according to fishing effort (number of trips). Between 1958 and 1960, however, landings increased despite a decrease in fishing effort. The rise was due to an increase in the average catch per fishing trip (a more refined measure of effort is not available prior to 1962). The rather sharp drop in landings in 1964 resulted from the combined effects of a decrease in average catch per fishing trip and a drop in fishing effort.

An analysis of available data from American Samoa indicates that catch per unit of effort, in terms of numbers of albacore taken per 100 hooks fished, has not shown any upward or downward trend during 1963 and 1964. On the other hand, the weight of albacore landed per 100 hooks declined significantly in 1964 (fig. 3). The decline was largely due to a decrease in mean size of fish taken by the fishery in 1964 as compared to 1963 and earlier (fig. 4).

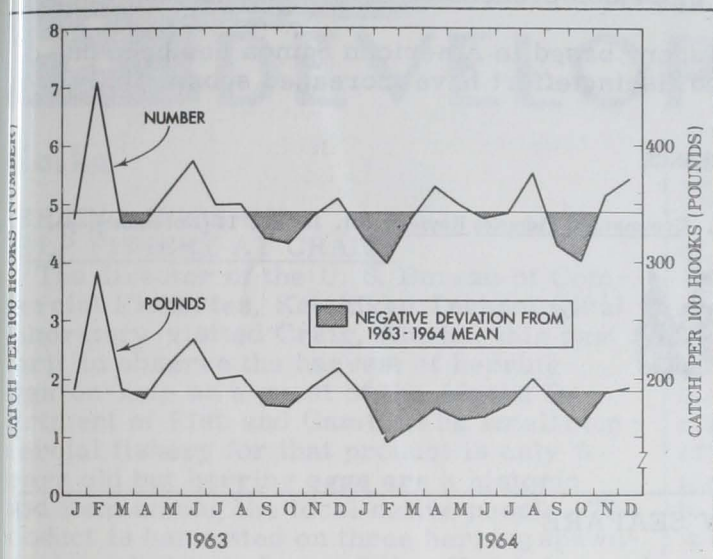


Fig. 3 - Catch per 100 hooks of albacore, in numbers and in weight, for 1963 and 1964, from data of vessels based at American Samoa.

The available data indicate that the catch of albacore tuna has decreased in recent years, mostly in terms of weight of fish taken per unit of fishing effort. The decrease in mean sizes of albacore in 1964 was due to a complete change in size composition from 1963. The very smallest fish available to the fishery increased sharply (albacore under 85 centimeters or 33.5 inches in length numbered an estimated 9,045 in 1963 and 88,509 in the 1964 catches) and the numbers of the largest fish decreased (63,183 fish larger than 100 centimeters or 39.4 inches in 1963, but only 35,273 in 1964). In other size categories, fish between 86 and 90 centimeters (33.9 to 35.4 inches) increased greatly from 101,299 in 1963 to 214,826 in 1964, while fish between 91 and 100 centimeters (35.8 to 39.4 inches) decreased from 606,586 to 307,908.

Although changes in sex ratio, as well as shifts in fishing grounds, could greatly affect the mean sizes of fish taken (the average weight of male albacore is 4 to 10 pounds more than that of females; size of albacore in the South Pacific increases progressively from the Equator to around latitude 25° S.), the data for 1963 and 1964 indicate that those factors played only a small part in the size decrease of 1964. The proportion of male albacore tuna decreased only slightly from 64.3 percent of the sampled fish in 1963 to 62.1 percent in 1964. Similarly, the fishing effort in the area between latitude 15° S. and latitude 25° S., where the albacore are the largest, decreased slightly from 15.4 percent of total fishing trips in 1963 to 12.1 percent in 1964.

It appears that the decline in catch rate, in terms of weight of albacore taken per unit of effort, has resulted primarily from (1) some presently unexplainable movement of larger fish away from the areas of the fishery, particularly during February-May 1964, and (2) the entrance into the fishery in early 1964 of an abundant year-class. A preliminary analysis of the data suggests that the strong year-class contributed in large part to the decline in catch (weight) per unit of effort. If so, it may be expected that the catch (weight) per unit of effort will rise in subsequent seasons as the large year-class passes through the fishery.

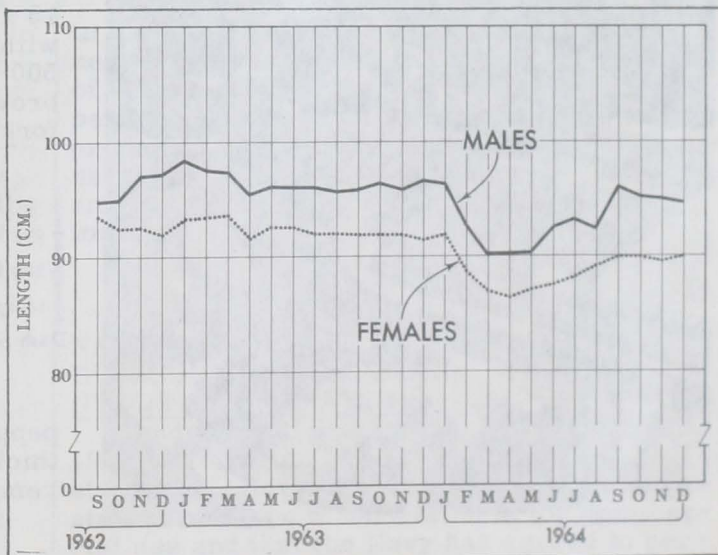


Fig. 4 - Monthly mean sizes of albacore, by sex, landed at canneries in American Samoa, September 1962 to December 1964.

This report is based largely on data collected at the field station established in American Samoa, and covers only the operations of the Samoa-based vessels. A considerable amount of

Japanese fishing effort is expended in the South Pacific which has not been considered in this study, at least partly because of the unavailability of data. Also, conclusions based solely on data from the relatively small American Samoa-based fishery (various estimates place its relative effort in the South Pacific at from 20 to 60 percent and variable from year to year) may not be entirely valid. To overcome this objection, South Pacific data from other sources are being incorporated where possible in the more comprehensive study being made.

In summary, the history of the long-line fishery based in American Samoa has been one of steady growth. The catch, area of fishing, and fishing effort have increased substantially over the years.

REFERENCE

VAN CAMPEN, WILVAN G.

1954. Tuna Fishing at American Samoa, January-April 1954. Commercial Fisheries Review, vol. 16, no. 11 (November), pp. 1-9.



HEARTY SEAFARE



HEARTY SEAFARE

12 (4 ozs. each) frozen, raw, breaded fish portions	$\frac{1}{4}$ cup melted fat or oil $\frac{3}{4}$ teaspoon paprika
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Place frozen, raw, breaded portions in a single layer on well-greased cooky sheets, 15 x 12 inches. Pour fat over fish. Sprinkle with paprika. Bake in an extremely hot oven, 500° F., for 10 to 15 minutes or until fish is brown and flakes easily when tested with a fork. Serve with Egg Sauce. Serves 6.

EGG SAUCE

$\frac{1}{4}$ cup butter or margarine	2 cups milk
$\frac{1}{4}$ cup flour	2 hard-cooked, eggs, chopped
$\frac{1}{4}$ teaspoon salt	2 teaspoons chopped parsley
Dash pepper	2 teaspoons lemon juice

Melt butter; blend in flour, salt, and pepper. Gradually add milk and cook until thick and smooth, stirring constantly. Add remaining ingredients; heat. Serves 6.

This recipe developed by home economists of the Bureau of Commercial Fisheries is from a 19-page, full-color, cookery booklet (Top O' the Mornin' with Fish and Shellfish, Test Kitchen Series No. 16) recently released by the Bureau of Commercial Fisheries, U. S. Department of the Interior. For 25 cents you can buy a copy from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20240.