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THE ATLANTIC TUNA FISHERIES, 1963[1/]

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ABSTRACT

The Atlantic landings of tunas and bonitos increased threefold from 1956 to 1963. In 1963, the total Atlantic catch was estimated at 257,600 metric tons. The increase can be traced to the expansion and modernization of the older tuna fisheries and the development of new fisheries. The latter category includes the African surface fishery, Northwest Atlantic purse-seine fishery, and the Japanese Atlantic long-line fishery.

The present report summarizes the recent trends in landings of the commercially important tuna species in the Atlantic, describes the statistics on landings and the fishing methods employed in the various tuna fisheries, and presents an initial attempt to assess the magnitude of the Atlantic tuna resources by comparing the Atlantic landings with Pacific landings.

CONTENTS

Tunas support one of the most widespread and most rapidly growing fisheries in the world today. In 1948, the total world catch of tunas, including bonitos, was 308,450 metric tons.[2/] The largest portion of the catch came from coastal waters, and only in the Pacific did the range of the fisheries extend far beyond the immediate shores. Since 1948 new tuna fisheries have developed, old ones have undergone modernization and expansion, and the landings of tunas and bonitos[3/] have quadrupled. About 1.25 million tons were landed in 1963.

In recent years a large part of this growth took place in the Atlantic Ocean. The total catch of tunas and bonitos from the Atlantic was 81,400 tons in 1956. By 1963, only 7 years later this take had more than tripled to 257,600 tons.

Although some of the growth in the Atlantic can be attributed to modernization and expansion of the older fisheries, the largest increase came from three new fisheries--the Japanese Atlantic long-line fishery, the African surface fishery, and the Northwest Atlantic purse-seine fishery.

Descriptions of some of the tuna fisheries in the Atlantic are available, and some analytical studies have been carried out. Wilson (1965) described the development of the Northwest purse-seine fishery. Lima and Wise (1963) analyzed data from the long-line fishery off South America. For the eastern tropical Atlantic, LeGuen, Poinsard, and Troadec (1965) re-

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1/An earlier draft of this manuscript was distributed as a background paper for the Second Session of the FAO Working Party for the Rational Utilization of Tuna Resources in the Atlantic Ocean.

2/All weights presented in this report are in the metric system unless stated otherwise. A metric ton equals 2,205 pounds.

3/Includes species listed under the category of Tunas, Bonitos, Skipjack in the FAO Yearbook of Fishery Statistics (FAO 1964).

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viewed the surface fishery off Pointe-Noire (Congo-Brazzaville). There is still, however, lack of general information and statistics on the Atlantic tuna fisheries.

The objectives of this report are to: (1) present and discuss the recent trends in landi of the principal tuna species; (2) review briefly the major fisheries in the Atlantic with em phasis on newly developed fisheries; and (3) compare Atlantic landings with Pacific landin to gain some insight into the magnitude of the potential tuna resources in the Atlantic.

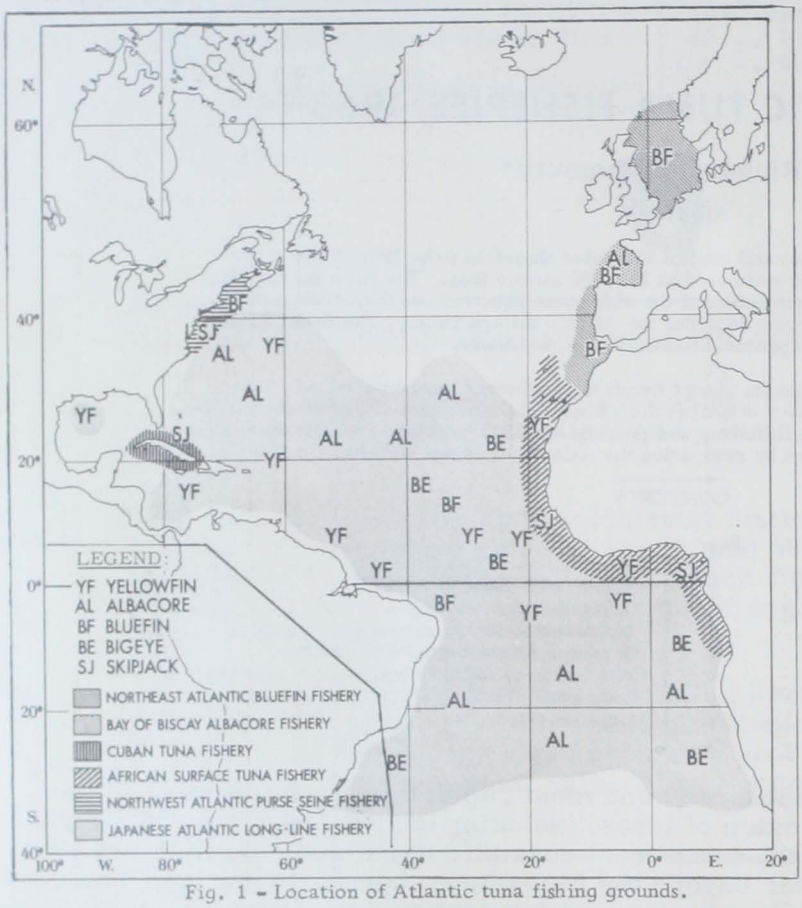

Fig. 1 - Location of Atlantic tuna fishing grounds.

This discussion is limited to five species of tunas and tuna-lik fishes considered to be of worldwi importance: yellowfin (Thunnus al cares), albacore (T. alalunga), blue (T. thynnus), bigeye (T. obesus), an skipjack (Katsuwonus pelamis). It convenient to treat the Atlantic fis eries by area, as follows: (1) Nort east Atlantic bluefin fishery; (2) Ba of Biscay albacore fishery; (3) Cub tuna fishery; (4) African surface tu fishery; (5) Northwest Atlantic purs seine fishery; and (6) Japanese Atl tic long-line fishery. Figure 1 sho the general location of these fisher ies. The numerous subsistence fis eries located along the coasts of co tinents and islands are not discusse Also omitted are fisheries for whi information is not readily available from the literature, such as the po and-line fishery in the Azores Isla

A brief description of the dif ent methods of fishing discussed this report may be appropriate. four basic methods of tuna fishing the Atlantic are pole and line, pur seine, long line, and traps.

The pole-and-line method is used in surface fishing and is also commonly known as li bait fishing. Small fish are tossed into the midst of a tuna school to attract the tunas to th fishing boat. Fish are caught with barbless hooks attached to a length of line on a bamboo pole. Rawlings (1953) provided a good description of the method employed on a small scal in Cuba, and Godsil (1938) gave an excellent account of the large pole-and-line tuna fisher then operating out of California.

The purse seine also is employed for surface fishing. Here a large net is set around school of tuna and by a "pursing" arrangement the bottom of the net is closed to prevent e cape of the fish. After the net has been pursed the catch is brailed onto the fishing boat. McNeely (1961) gave an excellent description of the present purse-seine gear and method employed in the eastern Pacific.

The pelagic long-line gear was developed by the Japanese and is used to catch the lar size tunas and billfishes. The gear consists of a series of mainline sections suspended irc the surface of the water by floats. Attached to the mainline at intervals are dropper lines with hooks baited with fresh or salted fish. The depth of fishing is variable and dependent the length of line (mainline, float line, and dropper), the distance between buoys, and the pr vailing currents. In most long-line fishing, however, the hooks are placed at depths of 200 700 feet. The gear is set in the early morning and is allowed to drift free of the ship. Hau

is usually started in the early afternoon. A Japanese boat usually fishes about 2,000 hooks per day. The total length of long-line fished on one set may equal about 50 nautical miles. Shiro (1950) reviewed the historical development of commercial long-line gear in Japan.

The traps used in tuna fishing along coastal waters of the Atlantic are described briefly in this paper in the section on the Northeast Atlantic bluefin fishery.

TRENDS IN TUNA LANDINGS, 1956-63

Landings of the five principal species of tuna from the Atlantic Ocean and adjacent seas[4/] for 1956-63 are shown in figure 2. In this and subsequent discussions on landings the reader is referred to comments on the availability and accuracy of world catch statistics (Chapman 1964). Chapman pointed out that "It is questionable whether the totals (landing figures) thus arrived at are closer than ten or fifty percent of being accurate."

YELLOWFIN: Prior to 1956, the yellowfin tuna resources of the tropical Atlantic were not commercially exploited. FAO records (FAO 1964) show only 200 tons of yellowfin landed from the Atlantic in 1956, all by U.S. vessels. Undoubtedly, yellowfin were taken in subsistence fisheries located along the coastal waters of the tropical Atlantic. These catches were included, however, either in the totals of other species or were not reported to FAO. As the African surface fishery and the Japanese long-line fishery developed, the landings of yellowfin tuna steadily increased from 2,100 tons in 1956 to 74,700 tons in 1963. Catches declined somewhat in 1961 and 1962 but increased again in 1963. The decline in 1961 and 1962 was attributed to the relatively low yellowfin catches by the Japanese long-line fishery.

Although the contribution of the African surface tuna fishery to the total yellowfin catch has increased recently, most of the annual landings have come from the Japanese long-line fishery. In 1963, the Japanese fishery landed 55 percent of the Atlantic yellowfin catch.

ALBACORE: Albacore and bluefin tunas made up most of the Atlantic tuna catch prior to 1956. In 1956, albacore landings for the Atlantic were 37,700 tons. With the exception of a small quantity reported from Angola, all came from the important albacore fish-

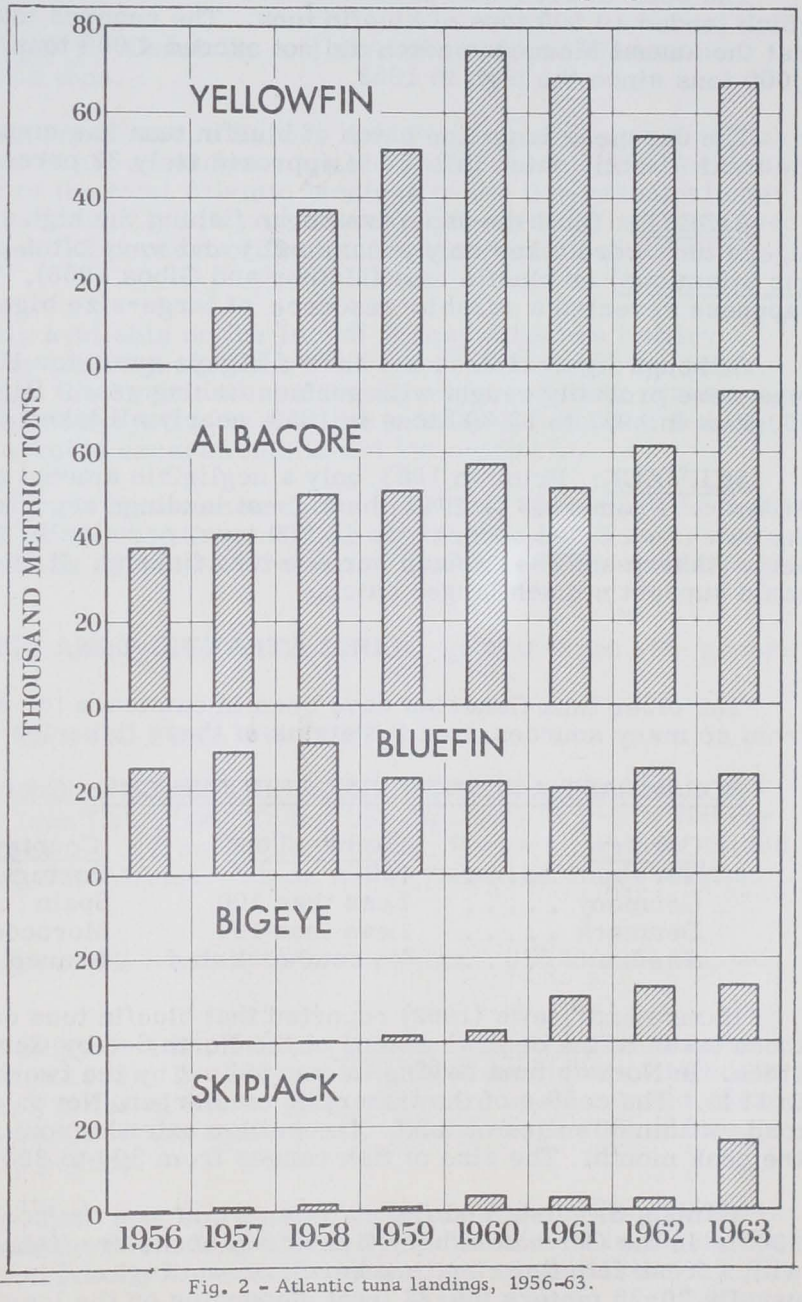

Fig. 2 - Atlantic tuna landings, 1956-63.

4/ Including the Mediterranean Sea.

ery in the Bay of Biscay. From 1956 to 1963, the catch increased from 37,700 tons to 74,500 tons, principally due to the increased effort of the Japanese long-line fishery. The Japanese have increased their share of Atlantic albacore landings from about 2 percent in 1957 to 37 percent in 1963.

BLUEFIN: The Atlantic bluefin tuna landings increased from 25,200 tons in 1956 to a high of 31,100 tons in 1958, followed by a noticeable decline from 1959 to 1963. For 1959-63 the annual landings averaged 22,900 tons. From his examination of the long-term trends, K. Tiews (personal communication) reported that the recent landings were considerably lower than for the 1952-55 period, when the average annual bluefin landing for the Atlantic (excluding Mediterranean catches) was 33,000 tons.

The peak in 1958 was primarily due to the excellent catches in the Moroccan fishery, which landed 10,500 tons of bluefin tuna. The records (data provided by K. Tiews) indicate that the annual Moroccan catch did not exceed 4,900 tons in 1950-57 and has not exceeded 6,000 tons since the high in 1958.

The Japanese long-line catch of bluefin tuna has steadily increased from 0.3 percent of the total Atlantic catch in 1957 to approximately 32 percent in 1963.

BIGEYE: Until the Japanese began fishing the high seas of the tropical Atlantic Ocean, bigeye tuna were taken only occasionally and were often confused either with blackfin (Thunnus atlanticus) or bluefin tuna (Mather and Gibbs 1958). The deep-fishing gear used by the Japanese revealed a sizable resource of large-size bigeye tuna in the Atlantic.

Although figure 2 does not show a bigeye catch for 1956, small quantities of small bigeye tuna were probably caught with surface fishing gear. Bigeye landings have increased from 500 tons in 1957 to 13,300 tons in 1963, nearly all taken by the Japanese long-line fishery.

SKIPJACK: Prior to 1963, only a negligible amount of skipjack tuna was landed from the Atlantic. From 1956 to 1962, the highest landings reported were 3,300 tons in 1960. In 1963, the catch increased suddenly to 16,700 tons, principally taken by the Northwest Atlantic purse-seine fishery and the African surface tuna fishery. It is generally believed that this resource could support a much larger catch.

OLDER ATLANTIC TUNA FISHERIES

The older tuna fisheries have been in existence for a long time. Information is available from so many sources, that the status of these fisheries need be reviewed only briefly.

NORTHEAST ATLANTIC BLUEFIN FISHERY: Countries and size of catch in 1963 were:

Country	Metric Tons	Country	Metric Tons
Norway	100	Portugal	400
Germany	Less than 100	Spain	7,900
Denmark	Less than 100	Morocco	1,500
Sweden	No catches listed	France	500

Hamre and Tiews (1962) reported that bluefin tuna caught off the Norwegian coast and those taken in the central waters of the North Sea by German fishermen come from the same stock. In Norway tuna fishing is carried out by the two-boat purse-seine method, introduced in 1946. The center of the fishery is off Bergen, Norway, and the bulk of the bluefin catch is made within 30 miles of land. The season extends from mid-July to September, with August the peak month. The size of fish ranges from 300 to 800 pounds.

Danish, Swedish, and German fishermen use the hook-and-line method of fishing (Tiews 1963). In the German fishery five or six hooks are fished from each boat. Each hook is baited with a fresh fish (herring, mackerel, or whiting) and is positioned at a predetermined depth, usually 20-25 meters (66-82 feet), depending on the length of dropper line attached to a float.

The gear is then allowed to drift free of the boat. The season for this fishery extends from mid-August to the end of October. The size of tuna caught ranges from 400 to 700 pounds.

In the lower latitudes of the Atlantic, bluefin tuna are taken mostly by traps operated along the coasts of Spain, Portugal, and Morocco. These traps are large rectangular nets which extend from shore out into the sea. The entire fishery depends on movement of the bluefin along the coasts during their seasonal migration. In Spain the fishing season extends from May to mid-August. The average size of bluefin taken exceeds 250 pounds.

In addition to the trap fishery, bluefin are taken in commercial quantities by troll gear off Portugal. The pole-and-line method with small fish as bait is used by French fishermen in the Bay of Biscay from June to August. Bluefin tuna taken in the Portuguese fishery are small, ranging from approximately 6 to 30 pounds. Those taken in the Bay of Biscay fishery are larger, from 15 to 75 pounds.

BAY OF BISCAY ALBACORE FISHERY: Countries and size of catch in 1963 were: Spain - 28,300 tons, and France - 14,400 tons.

Until the mid-1950's, the Bay of Biscay albacore fishery was the largest single tuna fishery in the Atlantic. Albacore landed by France and Spain totaled 35,700 tons in 1956, which represented approximately 56 percent of the total Atlantic landings of the five principal species discussed in this paper. In 1963, although the Bay of Biscay albacore catch had increased to 42,700 tons, this take represented only 22 percent of the total Atlantic catch of the five principal species.

Very little information is presently available on the Bay of Biscay albacore fishery. Until 1946, albacore were caught only by trolling. In 1947, the French introduced the pole-and-line method (Postel 1963). Although the French were recently reported to be experimenting with purse seines, the pole-and-line system is still the principal method of fishing. Information on the results of the purse-seine experiments is not yet available.

The albacore season extends from June to November. The fish first appear off the northwest coast of Spain in June (Postel 1963). In July they migrate into the Bay of Biscay, move inshore and to the northwest in August and September, return to the Bay of Biscay in October, and leave the bay in November.

Albacore taken by the Bay of Biscay fishery are small. The largest of three size groups is less than 25 pounds.

NEWER ATLANTIC TUNA FISHERIES

Development of new fisheries in the middle 1950's brought to the Atlantic the same mobility that characterizes some Pacific tuna fisheries. Today the Japanese long-line fishery covers a large part of the Atlantic. Tuna boats from Spain, France, Portugal, and the United States travel great distances to fish off West Africa. These newer fisheries merit detailed discussion.

CUBAN TUNA FISHERY: The catch of the early 1950's was about 1,500 tons of skipjack and blackfin tunas.

A small pole-and-line fishery for skipjack and blackfin (Thunnus atlanticus) tunas was first developed in Cuba in 1940 (Rawlings 1953). In 1956 the tuna fleet consisted of 18 boats. This fishery is coastal, mostly within 15 miles of shore. Skipjack make up 75 percent of the catch off the north coast but only 25 percent off the south coast. The average size of fish for both species was reported to be about 3 pounds.

In addition to the live-bait fishery, Cuba now has a small long-line fishery (Buesa 1964). The state-operated fleet presently consists of five long-liners which were built in Japan. In 1963, the total catch was 2,088 tons; presumably tunas made up the bulk of the take.

AFRICAN SURFACE FISHERY: Countries and size of catch in 1963 were:

Country	Yellowfin	Skipjack
	(Metric Tons)	
France	8,800	2,200
Spain	6,600	2,200
Japan	2,200	2,200
Portugal	1,100	-

Until 1955 yellowfin and skipjack tunas were taken only in small quantities by subsistence fisheries located along the coast of Africa and the coastal waters of the offshore islands. In late 1955, six pole-and-line fishing tuna boats from France began fishing off Senegal. They were successful in catching commercial quantities of tuna in these waters and returned the following season. The fishery has grown since its modest start in 1955, and the fleet in 1963 was reported to consist of 90 French, 50 Spanish, 7 Japanese, and a few Portuguese tuna boats. In addition to yellowfin and skipjack, small quantities of bigeye tuna are also landed by this fishery. The increase in fishing intensity was accompanied by a geographical expansion of the fishery as far south as Angola. In the initial stages of development, the fishery off Senegal was seasonal, from October to February. Expansion of fishing grounds towards tropical waters extended the fishing season.

Presently the African tuna fishery is a pole-and-line operation. Recently several attempts have been made to introduce purse seines, but this method, so successful in the eastern Pacific, has thus far failed in the African fishery. In late 1964, Japan sent a purse-seine team to Africa to try two-boat purse seining, reportedly without much success.

NORTHWEST ATLANTIC PURSE-SEINE FISHERY: Bluefin tuna occur seasonally along the Atlantic coast of the North American continent. This species long has been the basis of a small fishery in the New England area. Along the Maine coast bluefin are taken by harpoon; off Massachusetts this species is taken by hook and line in the northern sectors and by traps in Cape Cod Bay. Prior to development of the purse-seine fishery, the catch averaged about 800 tons per year.

Wilson (1965) has documented the development of the Northwest Atlantic purse-seine fishery. The present discussion will be limited, therefore, to the results of the 1964 fishing season and some general comments on the fishery.

Purse seiners from the eastern Pacific tuna fishery first appeared in the Atlantic in 1962 and caused several changes in the fishery. Prior to 1962, fishing was restricted to Cape Cod Bay and the adjacent coastal waters, and the catch consisted almost entirely of bluefin. The greater capabilities of the larger purse seiners led to extension of the fishing area farther offshore, and the discovery of commercial quantities of skipjack. In 1963, skipjack made up 35 percent of the total tuna catch of 8,281 tons (Wilson 1965). In 1964, skipjack became the predominant species in the landings and made up 55 percent of the total of 9,810 tons.

Countries and size of catch in 1964 were:

Country	Skipjack	Bluefin
	(Metric Tons)	
United States	5,000	4,000
Canada	360	450

In 1964, the tuna fleet operating in the Northwest Atlantic consisted of 13 medium and large purse seiners which normally fish in the eastern Pacific, 6 small purse seiners based in New England, and 2 small purse seiners from Canada.

Medium and large purse seiners fished an aggregate of 521 days in 1964 and made an average daily catch of 13.8 tons. By species, 7.8 tons of skipjack and 6.0 tons of bluefin were caught per fishing day. The season generally extends from June to September and covers the Continental Shelf from the Gulf of Maine to Cape Hatteras.

The size of bluefin taken by the purse-seine fishery varies from 60 to over 200 pounds. ipjack tuna range from 5 to 15 pounds; the majority weigh from 5 to 7 pounds.

JAPANESE ATLANTIC LONG-LINE FISHERY: Size of catch in 1963 was:

	Metric Tons		Metric Tons
Yellowfin	35,000	Bluefin	7,400
Albacore	27,700	Bigeye	13,300

The Japanese long-line fishery started in the Atlantic with an exploratory cruise by a esearch vessel off the coast of South America in December 1955 (Nakagome and Suzuki 1963). n the basis of this and several other successful exploratory cruises in 956, the Japanese commercial fleet egan fishing in the tropical Atlantic n 1957. Despite the great distance rom Japan to Atlantic tuna fishing rounds, the progressive increase in ishing effort and landings attest to a ighly successful fishery.

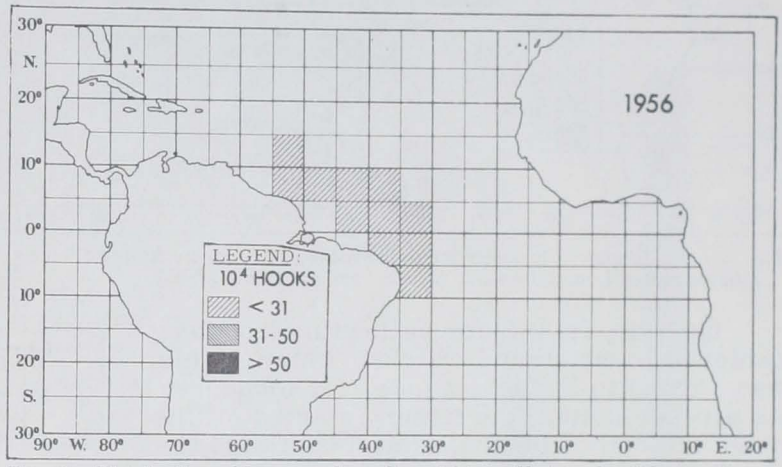

Fig. 3 - Distribution of Japanese long-line fishing effort in the Atlantic Ocean, 1956--adapted from Shiohama, Myojin, and Sakamoto (1965).

Development and expansion of he Japanese long-line fishery are hown in figures 3, 4, and 5. Fishng was restricted in 1956 to the western Atlantic off South America. By 1958, the long-line fishery had extended throughout the tropical Atlantic from South America to Africa. Effort was generally confined to the area between the Equator and latitude 10° N. By 1962, the area of operation had expanded as far as latitude 30° N. and 30° S.

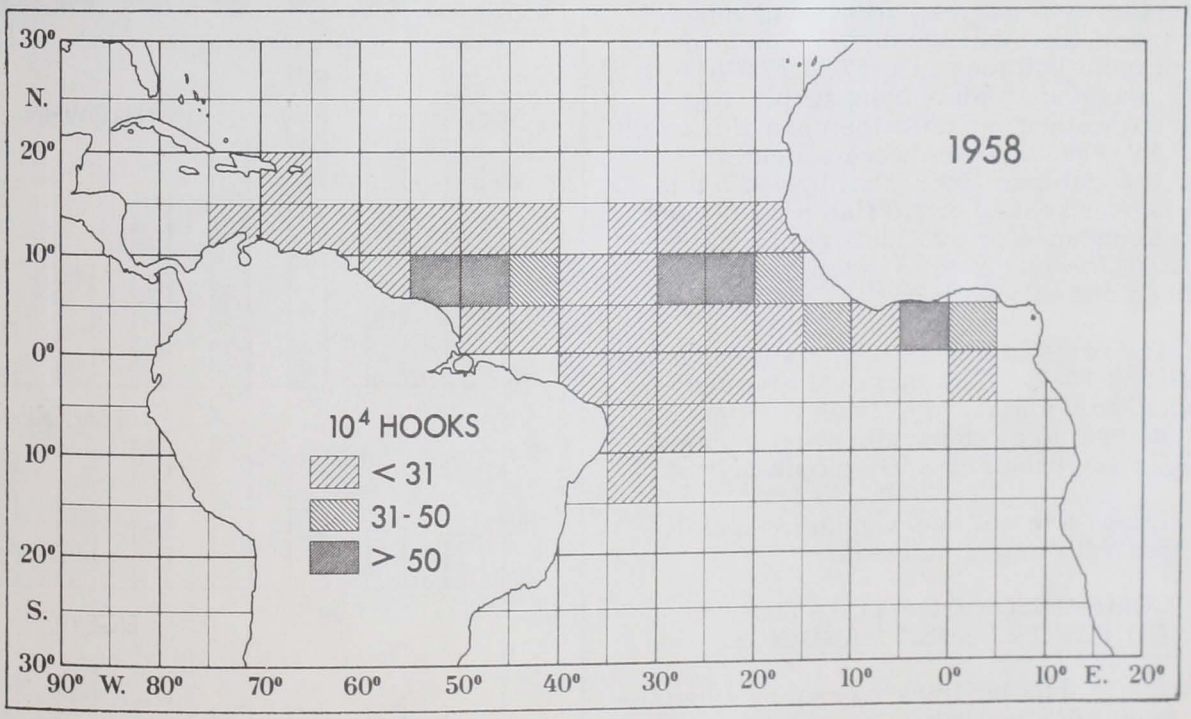

Fig. 4 - Distribution of Japanese long-line fishing effort in the Atlantic Ocean, 1958--adapted from Shiohama, Myojin, and Sakamoto (1965).

Figure 6 shows the trends in effort from 1956 to 1962 and the changes in fishing success. Only 136,000 hooks were fished in the Atlantic in 1956, primarily by research vessels operating in the western Atlantic. By 1962, total effort had increased to 54,340,000 hooks, representing approximately 27,200 boat-days. The lower panels in figure 6 show general trends in catch per unit of effort for the three principal species (yellowfin, albacore, and bigeye). The most striking feature is the sharp drop in catch rates for yellowfin--from an average of 7 to 9 fish per 100 hooks in 1956-58 to less than 2 per 100 hooks in 1962. In terms of tonnage these rates represent a drop from 7 tons to $1\frac{1}{2}$ tons per fishing day. One would strongly suspect a decrease in stock size, although the change could be attributed in part to a shift in fishing grounds.

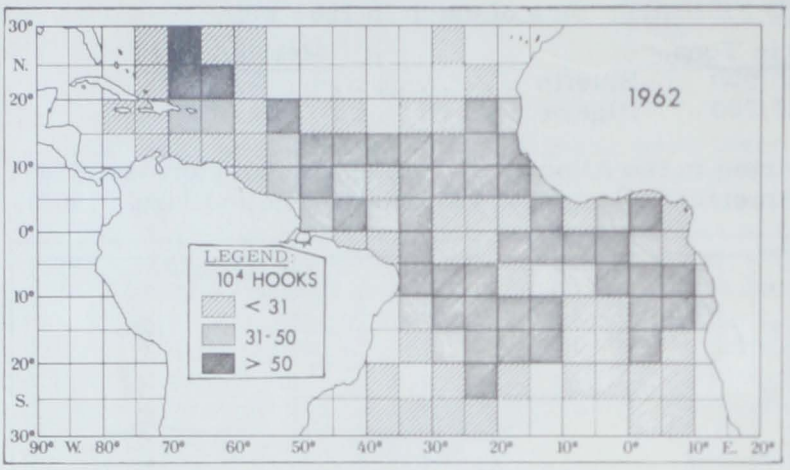

Fig. 5 - Distribution of Japanese long-line fishing effort in the Atlantic Ocean, 1962--adapted from Shiohama, Myojin, and Sakamoto (1965).

Initially, fishing for yellowfin tuna was centered in equatorial waters. Later, fishing was shifted to higher latitudes for albacore. As already stated, the fishery started off the coast of South America, moved eastward to the African coast, then expanded north and south. Although a detailed study has not been made of this shift in effort, it is likely that the good albacore catches in temperate waters caused a shift of a large part of the total effort away from the yellowfin grounds. The trend of the albacore catch, which increased from 900 tons in 1957 to 27,700 tons in 1963, suggests a shift from tropical to temperate waters, as does the change in catch rates. In 1956, albacore were caught at a rate of 0.8 fish per 100 hooks; by 1962, this figure had increased to 2.0 fish per 100 hooks. Unless abundance or availability of albacore increased, the increase in catch rates must have been due to a shift of the fishery.

Catch rates of bigeye tuna also increased in 1961 and 1962. This increase also may be attributed to a shift of the fishery. Bigeye, like albacore, are temperate-water tunas. Yellowfin are predominantly tropical.

Skipjack are not taken in commercial quantities with long-line gear.

COMPARISON OF ATLANTIC AND PACIFIC TUNA LANDINGS

Atlantic tuna landings increased substantially from 1956 to 1963. The catch became sufficiently large to raise questions about the size of the resource and its ability to sustain a large yield. For an evaluation of the east-

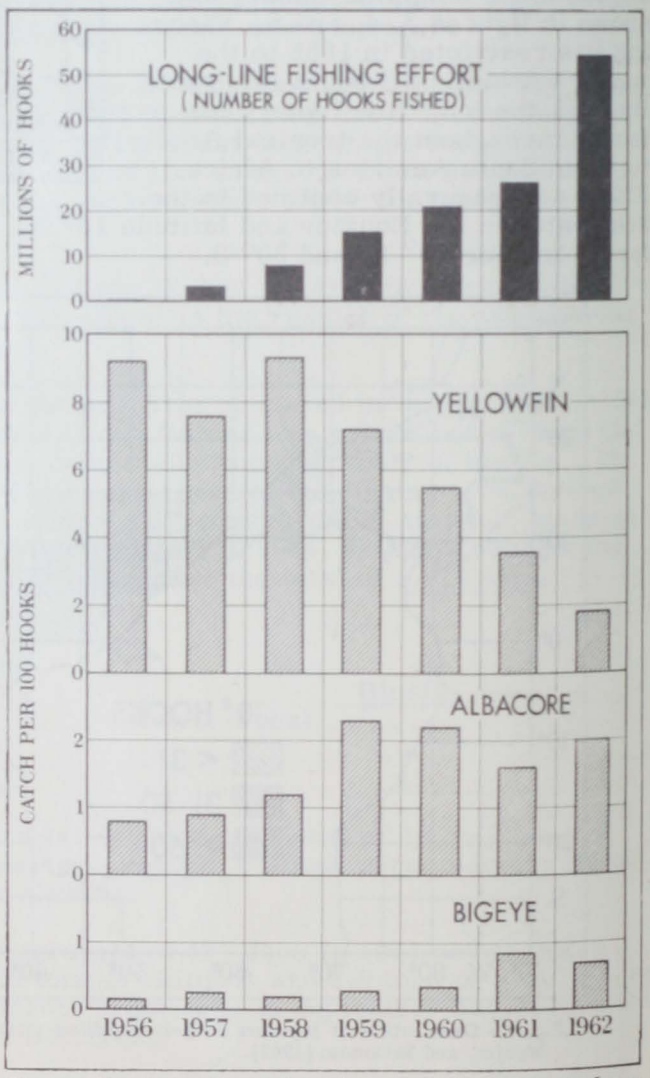

Fig. 6 - Trends in effort and catch per unit of effort in the Japanese long-line fishery.

er Pacific yellowfin stock, Schaefer (1957) required detailed catch and effort data covering a number of years. Such data are presently not available for the Atlantic tuna fisheries. By accepting several general assumptions and by comparing landings made in the Atlantic and Pacific, a rough estimate of the magnitude of the Atlantic resource can be obtained. The following basic assumptions were made:

1. Tuna resources of the Pacific, except for yellowfin in the eastern tropical region, have not been overexploited. Therefore, landings of the five principal species in the Pacific for 1962 probably were less than the maximum sustainable yield of the Pacific stocks as a whole.

2. Environmental conditions in the two oceans are similar, as far as the tunas are concerned.

The present discussion is general and speculative. Hence, the figures for the ocean areas refer to the entire ocean. No attempt has been made to correct for variations in distribution of each tuna species. Sverdrup, Johnson, and Fleming (1942) indicate the size of the Pacific as 165,246,000 km.^{2} and the Atlantic as 82,441,000 km.^{2}. The Atlantic is approximately 50 percent the size of the Pacific. Thus, we can assume that the potential yield of the Atlantic resource is 50 percent of the yield from the Pacific.

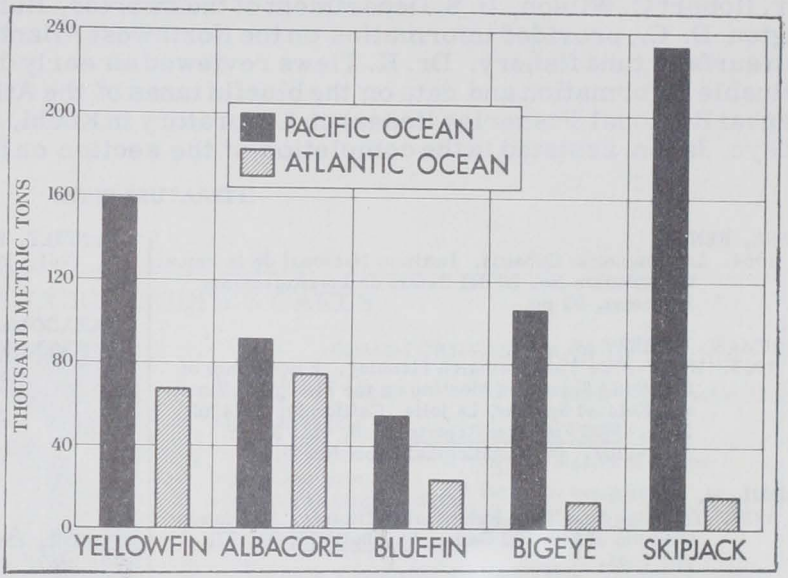

Fig. 7 - Landings of five tuna species from the Pacific (1962) and Atlantic (1963).

Figure 7 shows annual landings of the five species from the Atlantic in 1963 and the Pacific in 1962. On the basis of the assumptions made, the following comparisons and estimates can be made from the catch data:

1. Exploitation of yellowfin in the Atlantic has not reached the same level as in the Pacific. The Atlantic catch of 67,400 tons represents about 42 percent of the Pacific landings of 159,100 tons.

2. The Atlantic albacore landings of 74,500 tons represent approximately 82 percent of the Pacific landings of 91,300 tons. On the basis of area, albacore are being caught at a greater rate in the Atlantic than in the Pacific. The Atlantic landings have exceeded the estimated minimum potential yield; it is possible, however, that the albacore resource in the Pacific has not yet been fully exploited.

3. The Atlantic bluefin landing of 23,400 tons in 1963 is approximately 43 percent of the Pacific landing of 54,600 tons; the Atlantic bluefin catches probably can be increased. As pointed out in the discussion of this species, however, the landings of earlier years (1952-55) exceeded those of the more recent years (1959-63). The highest annual landing since 1950 was 36,400 tons landed in 1955. This take is approximately 67 percent of the 1962 Pacific landing. F. Mather (personal communication) has obtained a high rate of return of tagged bluefin tuna in the Northwest Atlantic. This high return suggests the possibility of overfishing. Whether the bluefin stock is being overfished will require further research.

4. Atlantic landings of bigeye tuna were considerably less than in the Pacific. The Atlantic catch of 13,300 tons was only about 12 percent of the Pacific catch of 106,000 tons. The fishery for bigeye in the Atlantic probably is not taking the maximum potential yield.

5. Skipjack represent the largest undeveloped tuna resource in the Atlantic. Since the magnitude of the Atlantic landings of yellowfin and bluefin tunas are comparable to Pacific landings per unit area, it seems unlikely that there are limiting factors in the Atlantic which would make for a relatively small skipjack resource in this ocean. The Atlantic skipjack catch of 16,700 tons represents only 7 percent of the total Pacific landing of 234,100 tons. Atlantic skipjack catches must increase sevenfold to correspond, area for area, to Pacific landings. The Atlantic skipjack fishery should yield at least 117,000 tons. We might assume that this figure is a minimum estimate, for it is generally believed that skipjack in certain parts of the Pacific are still underexploited.

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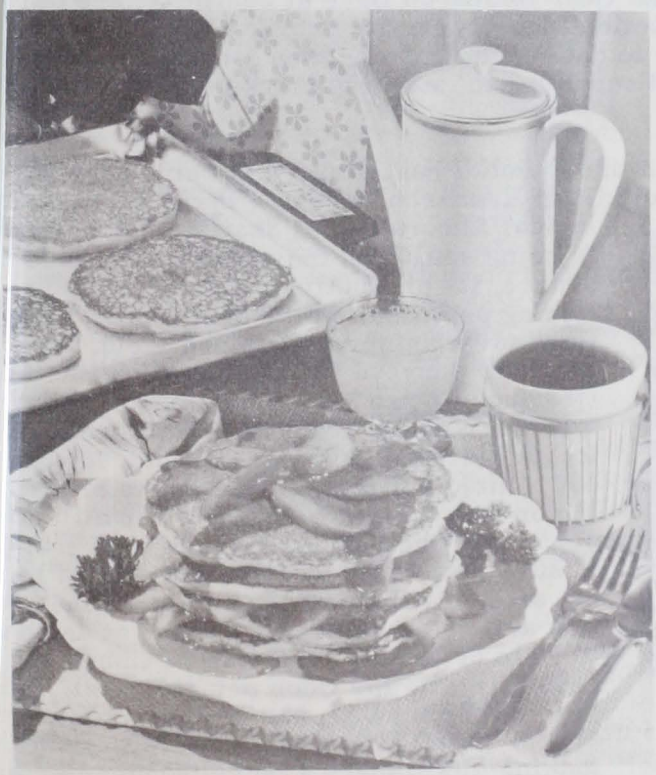
CLAM-CORN GRIDDLE CAKES



CLAM-CORN GRIDDLE CAKES

2 cans (7½-ozs. each) minced clams
1½ cups sifted flour
1 cup yellow corn meal
5 teaspoons baking powder
1 teaspoon salt
1½ cups clam liquor and milk
2 eggs, beaten
⅓ cup melted fat or oil
Butter or margarine
Cran-applesauce

Drain clams, reserving liquor. Sift dry ingredients together. Add remaining ingredients except butter and Cran-applesauce. Stir only until blended. Drop ¼ cup batter onto a hot, well-greased griddle or fry pan. Fry 1 to 2 minutes or until brown. Turn carefully and fry 1 to 2 minutes longer or until brown. Serve with butter and Cran-applesauce. Makes approximately 18 griddle cakes. Serves 6.

CRAN-APPLESAUCE

1 can (1 lb.) jelled cranberry sauce
½ cup applesauce
¼ teaspoon cinnamon

Combine all ingredients and blend thoroughly. Chill. Makes approximately 2 cups sauce.

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. 15) 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.