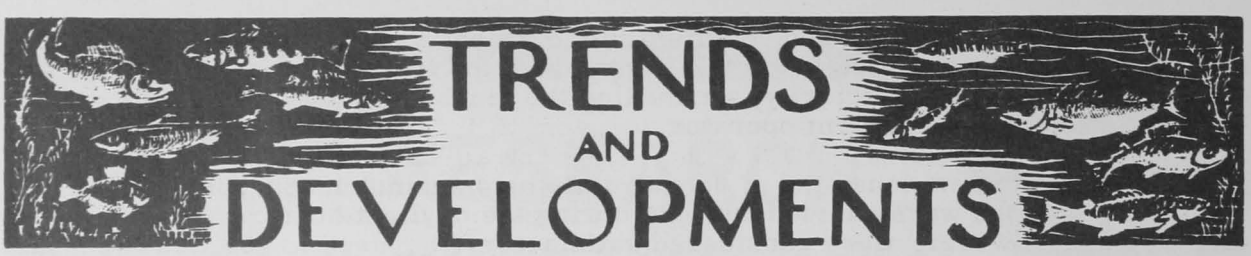


Additions to the Fleet of U. S. Fishing Vessels

A total of 76 vessels of 5 net tons and over received their first documents as fishing craft during July, 87 in June, and 94 in May 1954. In 1953 the totals were July 72, June 107, and May 76 craft. Louisiana led with 14 vessels in July and with 16 vessels in June, while Texas was the leader in May with 17 vessels.

Vessels Obtaining Their First Documents as Fishing Craft, May-July 1954 and Comparisons

Section	July		June		May		Seven months ending with July		Total 1953
	1954	1953	1954	1953	1954	1953	1954	1953	
	(Number)								
New England	3	2	8	4	2	7	21	16	20
Middle Atlantic	3	3	2	1	6	3	13	13	19
Chesapeake	8	6	7	11	19	2	62	42	83
South Atlantic	14	12	21	10	10	11	77	62	116
Gulf	31	24	38	20	33	27	255	136	264
Pacific	13	22	10	43	16	25	76	130	164
Great Lakes	-	-	-	-	-	-	3	5	7
Alaska	4	2	-	18	8	1	20	37	53
Hawaii	-	1	-	-	-	-	1	1	3
Unknown	-	-	1	-	-	-	1	-	-
Total	76	72	87	107	94	76	529	442	729

Note: Vessels have been assigned to the various sections on the basis of their home port.

During the first 7 months of this year, 529 vessels received their first documents as fishing craft, compared with 442 during the same period in 1953. The gain in documentation during the first 7 months of 1954 took place mostly in the Gulf States where 255 vessels were added to the fleet as compared with 136 in the same period in 1953.

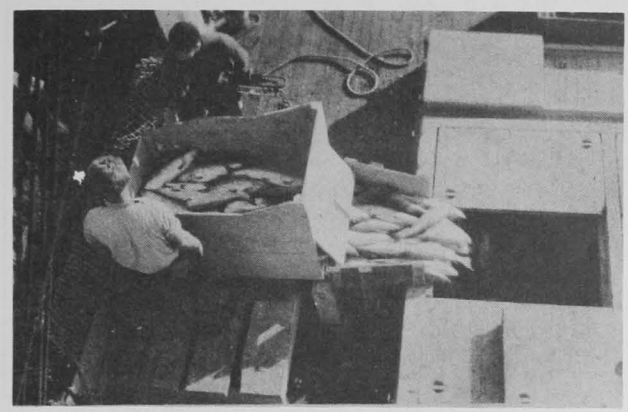
Alaska

SALMON PACK IN 1954 SHOWS INCREASE: In an address delivered to the American Fisheries Society convening in Seattle, Director John L. Farley of the U. S. Fish and Wildlife Service, revealed on September 15 that this year's Alaska salmon pack, as of August 21, totaled 2,845,307 standard cases (48 1-lb. cans) as compared with 2,603,101 cases on the same date last year. While a small additional pack will be forthcoming from the limited fall fishing seasons, this figure represents, for all practical purposes, the pack for 1954.

Despite the increase over last year's pack, 1954 falls far below normal and is 728,693 cases short of the 1952 pack of 3,574,000 cases. The comparatively meager pack was expected, however, due to a vigorous Service program aimed at preserving Alaska salmon runs in certain areas for brood stock to rehabilitate the fishery. This conservation program was necessitated by overexploitation of the fishery.

The program has the backing of the fishermen and canners, as well as that of the Department of the Interior.

The 1954 pack in southeastern Alaska came to 1,124,715 cases as compared with a pack of 977,682 cases last year. The central Alaska pack was 1,330,620 cases as against 1,350,589 cases in 1953. In western Alaska the pack was 389,972 cases as compared to 533,996 cases last year.



Lowering sockeye salmon to hold of buyer.

Bristol Bay had good runs of red salmon this year in two districts, and poor to fair runs in the other two, as anticipated. In the latter case, a greater proportion of the runs was permitted to escape. This should result in larger returns in the next cycle.

In central Alaska, runs were about normal with good packs and escapements of pinks and chums at Kodiak. Red salmon runs, however, were only fair, with poor runs at Chignik reported. The Copper River red salmon pack, though, was the largest on record.

The complete closure of Prince William Sound resulted in near optimum escapements of pink salmon. If survival is good, this fishery should be normal in 1956.

Restrictions in southeastern Alaska, whereby large bays were closed to seining, and trap potential was cut by 50 percent, resulted in generally good early escapements of pinks. The later pink runs, however, were small and 4 to 7 days additional closures had to be applied. This is expected to result in considerably better escapements than in the parent year of 1952.

California

REDUCTION OF SARDINES NOT PERMITTED: Sardine reduction applications of 40 fish processors were turned down by the California Fish and Game Commission at its last meeting, a June news release from that Agency points out.

This is the second straight year that all applications to reduce California sardines into commercial oils and meal have been refused by the State. Reduction of whole fish is the only phase of the State's fishing industry over which the Commission has regulatory control.

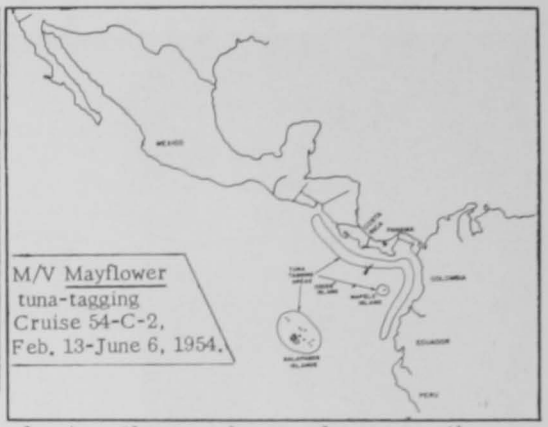
* * * * *

TUNA TAGGED BY COMMERCIAL VESSEL "MAYFLOWER" (Cruise C-2-54): A total of 1,822 tuna--713 yellowfin, 1,069 skipjack, and 22 big-eyed--were tagged by the commercial vessel Mayflower on a four-months' cruise off Central and South America for the California Department of Fish and Game (see table). The vessel sailed from San Diego February 13 and cruised off the coasts of Nicaragua, Costa Rica, Malpelo Island, Panama, Colombia, Ecuador, and the Galapagos Islands, returning to San Diego June 6.

A total of 831 type "F" and 991 type "G" tags were used. The efficiency of the type "G" tags was increased by reducing the length of the outer jacket to six inches. This permitted the tags to fit the fish better and yet allow adequate room for increase in growth.

Record of Tuna Tagged by Mayflower, February 13 to June 6, 1954

	Yellowfin Tuna	Skipjack Tuna	Big-eyed Tuna	Total
	.. (Number of Fished Tagged) ..			
Nicaragua	9	128	-	137
Costa Rica	144	63	-	207
Malpelo Is.	7	6	-	13
Panama	6	0	-	6
Colombia	187	155	-	342
Ecuador	76	370	-	446
Galapagos Is.	302	347	22	671
Grand total	731	1069	22	1822



Extensive night-light collections were made during the cruise and among the specimens taken were several post-larval yellowfin tuna and skipjack. These specimens were to be processed. Several hundred other specimens were also collected for processing.

* * * * *

CENSUS OF FISH POPULATIONS OFF COAST CONTINUED BY "YELLOWFIN" (Cruise 54-Y-6): A census of fish populations along the coast of Central and Southern California, with particular emphasis on anchovies, Pacific herring, jack mackerel, and California sardine, was conducted by the California Department of Fish and Game"s research vessel Yellowfin. The blanket net was used by the vessel in the 18-days cruise from Bodega Bay to Pt. Mugu. The cruise ended at Los Angeles on June 11.

A total of 39 light stations were occupied at which sets were made with the blanket net. Most of the fish collected were taken within two miles of the coast. The Yellowfin traveled approximately 330 miles while scouting for fish. Twelve schools were observed; 11 of these were believed to be squid and one was anchovy. Several hundred very small spots of from 10 to 100 individuals were seen in Monterey Bay and were believed to be squid.

* * * * *

VARIOUS TRAWL MESH SIZES FOR DOVER SOLE TESTED BY "N. B. SCOFIELD" (Cruise 54-S-3): The escapement of Dover sole from trawl nets of various mesh sizes and kinds were tested by the California Department of Fish and Game's research vessel N. B. Scofield in cooperation with the States of Washington and Oregon. The vessel sailed from Los Angeles on May 7 and cruised the California coast between Los Angeles and Trinidad Head, and returned to Los Angeles on June 11.

Exploratory trawling with beam trawls was conducted off Santa Monica and Gaviota. Otter trawls were used at Avila and Point Reyes. Most of the cruise was spent working otter trawls in the 100- to 150-fathom area between Humboldt Bay and Trinidad Head. Under ideal conditions, four one-hour drags per day could be made. Unusually windy weather cut down the number of operational days. Forty-eight drags were made. Over 14,000 Dover sole (Microstomus pacificus) were measured. The remaining fish were sorted and measured by volume.

Results on the comparison of various mesh sizes will be presented to the Pacific Marine Fisheries Commission. The Commission will use this information in making their recommendations to the Legislatures of their respective states if they believe any net law changes are necessary.

Cans--Shipments for Fishery Products, January-June 1954

Total shipments of metal cans for fish and sea food during January-June 1954 amounted to 43,387 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 33,257 short tons for the same period last year. A substantial increase in the West Coast pack of canned tuna accounts for some of the increase.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Federal Purchases of Fishery Products

PURCHASES OF FRESH AND FROZEN FISH BY DEPARTMENT OF THE ARMY, JULY 1954: For the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force, the Army Quartermaster Corps in July 1954 purchased fresh and frozen fishery products amounting to 1,869,757 pounds, valued at $661,893 (see table). This was 37.0 percent lower in volume and 44.5 percent less in value than June purchases.

Purchases of Fresh and Frozen Fishery Products by Department of the Army
(July and the First Seven Months of 1954)

QUANTITY				VALUE			
July		January-July		July		January-July	
1954	1953	1954	1953	1954	1953	1954	1953
Lbs.	Lbs.	Lbs.	Lbs.	$	$	$	$
1,869,757	2,465,620	13,907,439	16,065,538	661,893	838,801	5,750,214	6,844,252

Army Quartermaster Corps purchases of fresh and frozen fish during the first seven months in 1953 totaled 13,907,439 pounds (valued at $5,750,214), 13.4 percent lower in quantity and 16.0 percent less in value as compared with the similar period a year earlier.

Prices paid for fresh and frozen fishery products by the Quartermaster Corps in July averaged 35.4 cents per pound as compared with 40.2 cents in June and 34.0 cents per pound in July 1953, indicating that the Corps is purchasing fish at lower prices in July than in June.

Great Lakes Fishery Investigations

FISHERY AND LIMNOLOGICAL SURVEY OF SOUTHERN LAKE MICHIGAN ("Cisco" Cruise V): The fishery and limnological survey of southern Lake Michigan was continued by the Service's research vessel Cisco. The vessel departed Grand Haven, Michigan, July 27 and stopped at points in Wisconsin, Michigan, and Illinois--the cruise was completed at Grand Haven, Michigan, on August 8.

Hydrographic transects were made across Lake Michigan from Grand Haven to Milwaukee, from Racine to Holland, and from South Haven to Waukegan. Three hydrographic stations were visited along each transect. A total of 680 numbered drift cards were distributed along the Grand Haven-Milwaukee and South Haven-Waukegan transects. One-half of these were packaged in plastic envelopes and the remainder were placed in glass bottles fitted with drags. Ten of each kind were dropped at 5-mile intervals along the transects. Experimental gill nets were set on the bottom at two different depths off both Grand Haven and Racine. An oblique gill-net set was made off Holland. Trawling was done off Grand Haven and Waukegan and in the areas between Milwaukee and Racine and between Holland and South Haven. Bathythermograph casts were made at 5-mile intervals along the transects and at all stations. An 8-hour intensive limnological study was made off Grand Haven.

The largest chub catches of the season were made off both Grand Haven and Racine. An especially good catch of larger chubs was made in the shallower gill-net set off Racine.

Except for the last few days of the cruise, the surface water temperatures of southern Lake Michigan were generally in the low 70's. Water temperatures near shore were slightly lower than those in midlake. Following high winds near the end of the cruise, the surface water near Grand Haven became much colder (as low as 55° F.), although there was only slight cooling a few miles out.

Drift-bottle recoveries made reveal the presence of somewhat irregular shore currents. No recoveries have been made of drift bottles and cards released in the middle of the lake. Apparently there is present at this time of year a large central eddy which has little or no free surface exchange with shore currents. Secci disc readings were very high during the cruise due to a decrease in plankton in upper waters.

Gulf Exploratory Fishery Program

MORE YELLOWFIN TUNA CAUGHT IN GULF BY "OREGON" (Cruise 24): A total of 112 large yellowfin tuna, weighing from 43 to 183 pounds and averaging 99 pounds each, were caught in the Gulf of Mexico by the Service's exploratory fishing vessel Oregon. The fish were captured on a two-week exploratory tuna long-lining trip in the northeastern Gulf outside of the 500-fathom curve. The Oregon returned to Pascagoula on July 27.

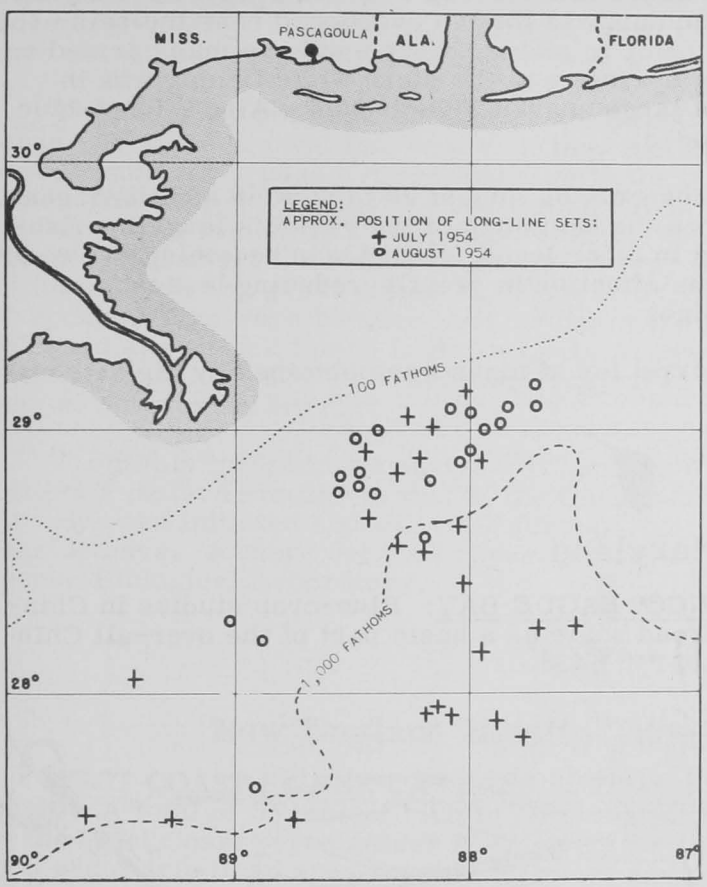
During the cruise there was a very important correlation between wave action and catch rate. During the first 10 fishing days the sea was flat calm and the catch rate was 0.7 fish per 100 hooks (43 yellowfin tuna caught). The last 4 fishing days had moderate-to-heavy seas and the catch rate jumped to 3.3 fish per 100 hooks (69 yellowfin caught).

The most serious problem was loss of fish due to the breaking of gangions and leaders. Ninty-five gangions were lost. An additional 65 gangions were replaced when defects could be found. It is estimated that approximately 90 percent of these losses were due to yellowfin tuna. Broken gangions were usually found adjacent to a caught tuna. On several occasions tuna were observed breaking gangions while the gear was being brought aboard.

Of the total 112 large yellowfin tuna caught, 24 were mutliated by shark bites. The 87 whole large yellowfin landed weighed 8,634 pounds and were stored in a Pascagoula freezer. In addition, 7 small yellowfin averaging 9 to 10 pounds each were captured on the long lines as well as 17 blackfin tuna, 10 white skipjack, 26

marlin, 1 sailfish, 69 sharks, and a number of other species. Length frequencies of the yellowfin tuna captured show several well-defined size groups present in the Gulf at the time of the cruise.

Thirty-five baskets (9 hooks per basket) of Japanese-type long-line gear were used on the first 7 sets. Five experimental baskets of hemp main line were then removed due to the excessive twisting of the main line which wrapped gangion and leader along the main line. An additional gangion was added to the remaining 30 baskets and two 30-basket (300 hooks) sets were made each day for the remainder of the trip. The gear was set as one continuous line with 10 baskets set with 20-fathom float-to-main line droppers, 10 baskets with 10-fathom droppers, and 10 baskets with the floats attached to the main line. Mullet, squid, and cigarfish (Decapterus punctatus) were used as bait. The cigarfish were in poor condition but were by far the most effective bait.



This chart shows the distribution of exploratory long-line fishing for tuna in the Gulf by the Service's vessel Oregon on cruises 24 and 25.

Damage to fish by sharks was considerable and over 20 percent of the fish caught were mutilated to some extent. Fifty-six sharks were chummed up and shot while on fishing stations. Sixty-nine were taken on the long lines.

Observations of surfacing tuna paralleled those made in preceding years during the summer months. Schools of blackfin, yellowfin, and white skipjack, sometimes mixed together, were seen every day during the trip.

The Oregon was scheduled to leave Pascagoula on August 10 on Cruise 25, returning August 31. The work outlined for this cruise is long-line tuna fishing in the central Gulf of Mexico. No specific area was designated but all fishing was to be done beyond the 500-fathom curve. One of the objectives is to test several types of nylon, cotton, and hemp gangions and main line in an attempt to reduce breakage of gear which was excessive on the two previous cruises. Another objective for the cruise is to try to find the most productive depth of fishing and to determine the best time of day for sets to be made.

* * * * *

"OREGON" CATCHES OVER SIX TONS OF YELLOWFIN TUNA IN GULF (Cruise 25): A total of 127 yellowfin tuna (13,042 pounds) were landed at Pascagoula, Mississippi, on September 1 by the Service's exploratory fishing vessel Oregon. These fish were caught in the northeast Gulf of Mexico on a three-week cruise commencing August 10.

Twenty-one sets were made mostly in the morning (see chart) with 7,160 baited hooks. Yellowfin tuna were taken on all except four sets. Of these four, the shallowest set made was in depths from 100 to 170 fathoms; one set was made at night; and one set was put out in the late afternoon. All morning sets over depths of 500 fathoms or more, with the exception of one, produced large yellowfin tuna. A single yellowfin tuna was taken on a set made with hooks fishing at a depth of approximately 85 fathoms but all other sets were with hooks fishing at depths from 15 to 25 fathoms.

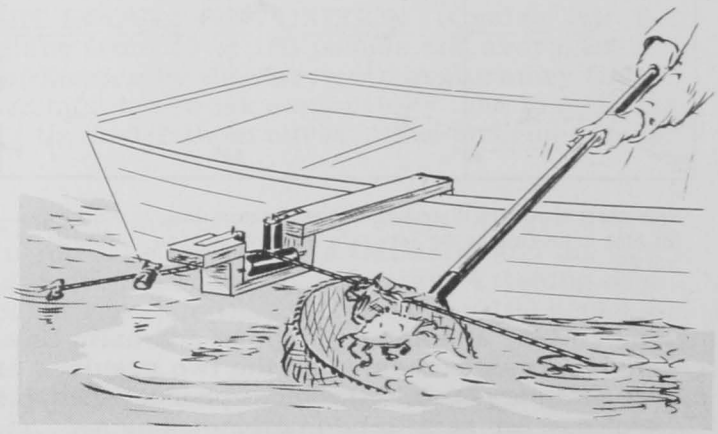
In addition to the large tuna landed, 19 were damaged by sharks. The average catch rate was 2 yellowfin tuna per 100 hooks. The best set produced 25 yellowfin at a rate of 5.1 fish per 100 hooks. Shark damage was reduced proportionately on this cruise by several measures. No bait was thrown overboard near the sets--the Oregon was moved a few miles just prior to making a set--and one man carried on a shark-catching and shark-shooting operation at the stern while fishing was in progress. Fins and livers from 104 large sharks were landed. Also 2 large blue marlin and 26 white marlin were landed.

The Oregon went into port at Pensacola on August 20 to pick up additional gear. The original Japanese gear used since the beginning of the vessel's long-line fishing in 1954 had been previously used in other localities and was becoming too weak to be satisfactory. The new gear was effective in greatly reducing losses from breakage of the gangions and main lines.

A series of the young of several species of tunas were obtained by dip nets under night lights while drifting.

Maryland

BLUE CRABS TAGGED IN CHINCOTEAGUE BAY: Blue-crab studies in Chincoteague Bay began last year on a broad scale as a basic part of the over-all Chincoteague Bay project started in 1952. One of the important problems recognized early in the survey was the clear definition of the population characteristics of crabs from that area. A migration study of crabs in the area was initiated in which mature female crabs were tagged because of the certainty of using a crab which would not lose the plastic strip by shedding. It was believed that the study might define the spawning area on the basis of knowledge of the movements of these crabs, according to the August 1954 issue of the Maryland Tidewater News of the Maryland Department of Research and Education.



Removing crabs from a crab-bait line with a dip net.

The crabs, procured from the local fishermen who have been very cooperative, were tagged by attaching a red plastic strip across the back shell by means of a stainless steel wire wound around the lateral spines. This method is simple and lends itself to handling large numbers of individuals, and this procedure is not harmful to the crabs. After tagging, they were released in or near the areas

where they were caught. A reward of $1 is paid for the return of each tag and the following information: (a) exact place of capture; (b) date; (c) name of collector; and (d) remarks about gear and habitat.

During July, August, and September of 1953 a total of 395 crabs were tagged and released in the Isle of Wight--Chincoteague area. To date 116 returns have been received. Discounting the offshore tagging, these returns amount to nearly 40 percent of the total number tagged. Fifteen of the 116 returns were of little biological value, most of them being found in picking houses, although one was returned by the proprietor of a restaurant in Chicago. In addition to those tagged in the Chincoteague area, 26 crabs were tagged in the Atlantic Ocean 3 to 8 miles off Ocean City, Maryland. No returns have been received from this tagging. So we have about 34 percent of the total releases which are of sound biological value.

The returns, not yet complete or analyzed, suggest a number of possible patterns. It was supposed that crabs, if they did travel in a southerly direction in the bays, would not bypass a direct passage to the ocean, such as the inlet at Ocean City. The pattern, based on a preliminary look at tagging returns, appears to indicate that a movement in a southerly direction did occur. Many of the crabs were recaptured a short time after release. These, of course, did not have the opportunity to move any great distance. Most of the crabs released in Chincoteague and Sinepuxent Bays were retaken near or below the Maryland-Virginia line. One crab, released at Fenwick Island Light in Little Assawoman Bay, bypassed the western entrance to Ocean City inlet and was recaptured near Chincoteague, Virginia, more than seven months later.

From this preliminary analysis it appears that the Chincoteague crab probably follows a pattern similar to that of the Chesapeake population. Larval sampling has already been initiated and will shed further light on the spawning areas of these seaside bays. A more detailed report on this study will be issued later by the Chesapeake Biological Laboratory.

New England Bluefin Tuna Investigations

WEST COAST SEINER CATCHES 55 TONS BLUEFIN TUNA OFF NEW ENGLAND: A total of 55 tons of bluefin tuna was landed at Gloucester, Massachusetts, by the West Coast purse seiner Western Pride on August 27. The tuna were caught on a 6-day trip in an area roughly 50 miles southeast of Cape Cod. The individual fish averaged approximately 50 pounds--very good canning size.

A U. S. Fish and Wildlife Service observer aboard the Western Pride reported that a large number of tuna schools were sighted along the northern edge of Georges Bank. The crew, most of whom are experienced California tuna fishermen, estimated that many of the tuna schools contained 200 to 300 tons of tuna. The large schools present certain problems in seining.

It is understood that the catch of tuna was purchased by a New England canner. The Western Pride was scheduled to resume fishing on or about August 30.

New York

NEW YORK CITY CRAB MEAT REGULATIONS AMENDED: An amendment to the New York City Sanitary Code relating to crab meat was announced recently by the Director of the Bureau of Food and Drugs. The new amendment, as follows, will go into effect on January 1, 1955:

s 163a. CRAB MEAT REGULATED: 1. No crab meat, other than crab meat which is packed in a hermetically sealed container and which has been sterilized in the container after sealing, shall be held, kept, offered for sale or sold for human food in the city of New York unless the said crab meat has been prepared, processed and packed in a plant that is under permit or approval of a federal or state inspection service approved by the board of health of the city of New York and the container thereof bears the certificate number issued to such plant by the approved inspection service or the name and address of the packer or other means of identification of the packer approved by the department of health.

2. Notwithstanding that the plant of a packer is under permit or approval of a federal or state inspection service as provided in subdivision 1 of this section, the department of health is empowered to exclude such packer from shipping crab meat produced at such plant into the city of New York, if such crab meat is suspected of containing pathogenic organisms or contains bacteria in excess of the following standards: More than 100 per gram of hemolytic staphylococcus aureus, or more than 100 per gram of coliform organisms, or more than 1,000 per gram of enterococci, or more than 100,000 colonies per gram in the total bacteria plate count."

Pacific Oceanic Fishery Investigations

COMMERCIAL LONG LINERS CATCH FOUR TONS OF YELLOWFIN TUNA IN LINE ISLANDS AREA ("Oceanic" and "Brothers," 1st Concurrent Cruise): The commercial Alaska halibut vessels, Oceanic and Brothers, using steel long-line gear, unloaded at Honolulu on June 23 about 8 tons of yellowfin tuna caught in the vicinity of the Line Islands. The vessels are 48 and 49 feet in length, respectively, and carry a crew of 3 men each.

The vessels fished a total of 10 days each, 7 days at Fanning Island and 3 days at Christmas Island. The Oceanic unloaded approximately 3,206 pounds of yellowfin tuna while the Brothers unloaded an estimated 4,863 pounds. Besides the yellowfin tuna, 3 big-eyed tuna and 7 marlin were also unloaded. The Oceanic fished an average of 425 hooks per day while the Brothers averaged 320 hooks per day.

This commercial trial produced very poor yellowfin tuna catches. Two reasons seem possible: (1) excessive losses to sharks probably caused by fishing too close to the islands; and (2) with an entirely new type of gear, apparently one of the boats was not reaching the proper depth. The boats plan on returning to the equator later in company with the Commonwealth, a larger boat.

The stainless steel cable main line was made up into reels of 1,600 fathoms each. As set, the main line was suspended by a buoy every 14 hooks (every 1,350 feet). All the fishing was done within 15 miles of the islands.

Both vessels fished in the same general area every day, but the Brothers experienced a catch rate of approximately 4.0 yellowfin tuna per 100 hooks while the Oceanic's fishing resulted in a catch rate of 1.4 yellowfin tuna per 100 hooks. The only difference in the makeup of the gear was that the Brothers used 25-fathom float lines throughout while the Oceanic used 10- and 25-fathom float lines in the ratio of approximately 3 to 1, respectively.

The yellowfin tuna catch was comprised of approximately 3 sizes of fish. One size at 45 pounds, another at 75 pounds, and the third at 125 pounds. The average weight of the yellowfin tuna was 86 pounds.

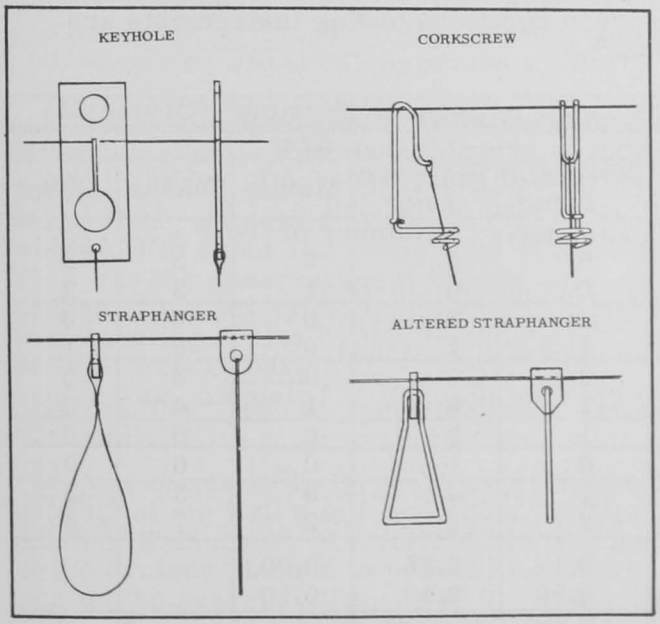
A surprisingly high percentage of the long line-caught yellowfin tuna were shark-eaten. The Oceanic lost 44 percent and the Brothers 50 percent to the sharks. Sharks were caught in great numbers.

* * * * *

NEW TUNA GEAR TESTED IN HAWAIIAN WATERS BY "JOHN R. MANNING" (Cruise 21): Sea tests of a new type of steel long-line gear for catching tuna were carried out on a 15-day cruise of the Service's Pacific Oceanic Fisheries Investigations research vessel John R. Manning. The cruise ended at Honolulu on July 29. The gear was developed by technicians of the Service's Honolulu laboratory.

These experiments mark the latest step in a program to adapt a fishing technique of Japanese origin to fit in with the economics of the United States tuna fishery. The tuna long line is the only fishing gear that has been consistently successful in capturing yellowfin tuna in the rich equatorial fishing grounds of the central Pacific region. However, as developed and used by the Japanese, the long line requires an inordinate amount of manpower and thus cannot be economically employed in its present form by United States fishermen.

The work aboard the John R. Manning was designed to test fishing methods by which a few men can easily and speedily set and haul many miles of tuna long line and many hundreds of hooks. Instead of the usual cotton line made up into a large number of separate units, called "baskets," which must be taken apart and put together by hand, the new POFI gear has continuous stainless steel main lines. This steel cable is wound up on reels mounted on a modified halibut fishing winch. The branch lines, which carry the hooks, are detached from the main line as it is hauled in and are stowed away on racks, instead of being coiled down with the main line as in the conventional commercial gear. A method has even been tested for automatically snapping the branch lines on the main line at the proper spacing as the line is being run out.



New types of dropper connectors used by John R. Manning in tuna long-lining in Hawaiian waters.

After preliminary tests indicated that the experimental gear could be fished satisfactorily, five days of fishing was done in a current eddy northwest of the island of Hawaii, an area which earlier reconnaissance had indicated might be a productive fishing ground. The big tuna (ahi) were scarce, however, and the catches were light. Thus, although the gear is technically successful, it still has not had a fair opportunity to show that it can catch fish as well as the generally used cotton long lines.

Three types of dropper connectors had been designed as substitutes for the AK snap used on standard gear. These were designated as "keyhole," "corkscrew," and "straphanger" gear. (See figure 1).

"Keyhole" and "corkscrew" gear performed less efficiently than standard gear. "Straphanger" gear was set both mechanically and by hand, but setting times were very slow. However, the behavior of the gear in the water was superior to that of

standard gear and recovery time was rapid, with little tangling. The vessel was returned to port and attempts were made to eliminate setting defects. All 29 baskets of steel gear were changed over to an altered "straphanger" design. This modified gear was fished on five stations of the cruise. Initial performance of the gear was poor. One-third of the droppers on the first station were missed in setting due to mechanical difficulties with the setting device but adjustment of the setter lowered this figure to less than 10 percent on an average station. Average setting time was 2 minutes and 54 seconds per basket. Recovery time was slow, averaging about 5 minutes and 45 seconds per basket. Much of this time loss was due to the necessity of stopping the winch while "straphanger" fittings were faired on the winch drum. Behavior of the gear in the water was excellent and little tangling was noted.

Sounding tubes were calibrated by lashing paired tubes to a 900-ft. BT and making lowerings down to 70 fathoms. Tube depths exceeded BT depth by about 7 percent. Readings of paired tubes agreed to within 2 fathoms.

Tubes used on the first part of the cruise were over five years old and some tube linings had deteriorated so that readings were questionable. New tubes used on the second part of the cruise gave much better results.

New tubes were attached to each dropper of 2 baskets of a 5-basket set of steel "straphanger" gear. Plotted profiles were corrected by measuring distances between buoys by a stretched line.

Twenty-three baskets of a 29-basket set of steel gear had tubes attached to middle droppers. Average depth was 82 fathoms with end baskets reaching to 120 fathoms. On 2 stations attempts were made to check tube depth by picking up the main line on the Bendix echo sounder. No traces could be obtained.

The sounding tubes calibrated well. While taking depth readings on the long line, occasionally the sounding tubes recorded greater depths than the actual length of the line laid; so it cannot be said until an explanation arises through further experiments that the readings recorded by these depth-recording instruments are good values for long line in the open seas.

Table 1 - Summary of Tuna Long-Line Catch - "John R. Manning" (Cruise 21)

Station	Date	No. of Baskets	Total Hooks Fished	Catch				
				Yellowfin Tuna	Big-eyed Tuna	Marlin	Sharks	Other
				..... (Number of fish)				
1	7/23/54	29 steel	194	0	0	0	3	3
		30 cotton	327	0	0	1	3	2
3	7/25/54	29 steel	285	1	3	0	0	0
		30 cotton	329	1	1	0	0	1
5	7/26/54	20 steel	208	0	0	0	0	0
		30 cotton	321	1	0	1	4	0
7	7/27/54	29 steel	266	1	0	0	0	0
8	7/28/54	29 steel	243	0	1	0	0	0
	Total	136 steel	1,196	2	4	0	3	3
		90 cotton	977	2	1	2	7	3
Total Catch/100 Hooks			Steel Gear	0.17	0.33	0.00		
			Cotton Gear	0.20	0.10	0.10		
Total Tuna Catch/100 Hooks			Steel Gear	0.50				
			Cotton Gear	0.31				

Five long-line stations were fished in the lee of Lanai and Hawaii (table 1). Twenty-nine baskets of steel and 30 baskets of cotton gear, both containing 11 hooks per basket, were fished on the first 2 fishing stations (stations 1 and 3). Due to

winch trouble on the latter of the 2 stations, only 20 baskets of steel and 30 baskets of cotton gear were fished at station 5. During the hauling operation on station 5, the Japanese line hauler broke down and the last 9 baskets of cotton gear were retrieved with the Rowe winch. At the remaining 2 fishing stations, only the steel gear was used.

The catch for the 5 fishing stations, a total of 136 baskets or 1,196 hooks (excluding missed droppers), on the steel gear was 2 yellowfin tuna, 4 big-eyed tuna, 4 sharks, and 3 Alepisaurus, or 0.50/100 hooks for all tuna.

The catch for the 90 baskets or 977 hooks on cotton gear was 2 yellowfin tuna, 1 big-eyed tuna, 2 black marlin, 7 sharks, and 3 Alepisaurus, or a catch rate of 0.31/100 hooks for all tuna. Obviously the steel gear fished more efficiently than the cotton gear although neither gear caught many tuna.

Contrary to the original plans, more time than expected was spent in testing the steel gear. Hence, practically no fishing was conducted in the areas that were being fished by the local commercial fleet. Nevertheless, catch reports from the local fish market showed an extremely poor tuna fishery during this period.

Conversation overheard over the radio between 2 long-line vessels indicated catches of only one or two tuna per day--a catch rate only slightly better than the John R. Manning.

Four schools of skipjack and five unknown schools were sighted in eight days of scouting. In all cases bird flocks accompanied the fish schools. While drifting off Lanai, two large fish schools accompanied by large flocks of birds were sighted. Two live-bait vessels, the Sailfish and Buccaneer were notified of the location of the schools by radio.

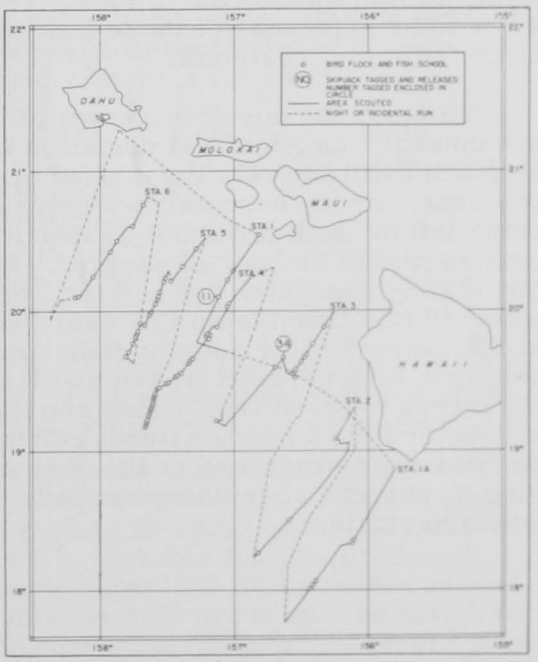
Standard surface trolling for tuna was attempted on all daylight runs. Eleven fishing hours produced no catch.

* * * * *

GREAT NUMBERS OF SKIPJACK TUNA FOUND IN HAWAIIAN WATERS BY "CHARLES H. GILBERT" (Cruise 16): Skipjack tuna (aku) schools were reported present in great numbers offshore south of Maui and Oahu and westward to about 100 miles west of Niihau. This was the observation of the biologist in charge of the scientific work on the skipjack tuna scouting cruise by the Service's research vessel Charles H. Gilbert. The cruise was completed at Honolulu on August 26.

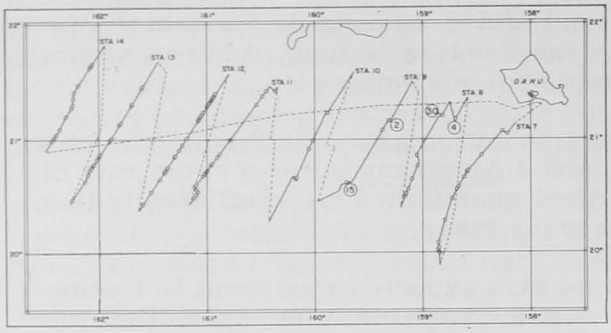
An exceptionally large concentration of schools of big fish was found about 20 miles north of Kalaupapa, Molokai. This was one of the cruises planned to provide information on the seasonal changes in the abundance of tuna schools around the islands, especially in those areas that are beyond the range of the present commercial fishery.

In 25 days of scouting, a total of 241 bird flocks and fish schools were sighted.



Cruise 16 (Part 1) of the Charles H. Gilbert, July 25-31, 1954.

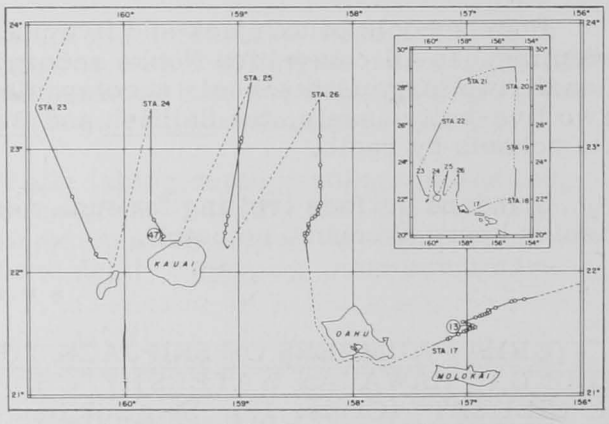
Of these, 45 were identified as skipjack, 8 as dolphin (mahimahi), 1 as yellowfin, and 187 were unidentified. Three dolphin schools not accompanied by birds were located by surface trolling. Schools were generally plentiful in the leeward waters of the Hawaiian Islands and scarce to the north. No schools were sighted beyond 100 miles of land to the north of the Islands.



Cruise 16 (Part II) of the Charles H. Gilbert, Aug. 4-13, 1954.

The eddy system west of the island of Hawaii was found to be flowing clockwise, opposite to the flow which has usually been found in this area. A counterclockwise eddy was found southwest of Oahu and there appeared to be more schools between the two systems. There were no marked eddy systems west of Kauai.

Fourteen schools were chummed with live nehu (Hawaiian anchovy) and fish were taken from eight of these. A total of 156 skipjack were tagged with the California-type plastic tube tags and released. Seventy-seven of the tagged fish were large (around 20 pounds) while the remaining 79 were small fish of around 5 pounds. Tagging of the small fish was accomplished without any difficulty and almost every fish swam away from the vessel in apparently good condition. On August 6, two small fish were tagged and released. One of these tagged fish was seen swimming alongside the Gilbert for about $4\frac{1}{2}$ hours after tagging in company with the remainder of the school which kept following the vessel. The white tag was seen streaming very nicely on its back. The difficulty experienced for a while in tagging the violently active large fish was overcome by using a pair of electrodes to shock the fish into momentary paralysis while tagging was accomplished. There were some evidences of these fish recovering from the treatment.



Cruise 16 (Part III) of the Charles H. Gilbert, Aug. 16-25, 1954.

To study the possible causes of "honeycombing," an abnormal condition in skipjack flesh wherein the cooked meat has a cellular appearance like a honeycomb, two experiments were carried out. In one, 40 fish were stored in crushed ice after being left on deck for about $2\frac{1}{2}$ hours after capture and another 40 were placed in the freezer within an hour of capture. In another experiment, 40 fish were placed in circulating sea water for 15 hours before being transferred to the freezer while another 40 fish taken from the same school were immediately dry-frozen. Inspection at the cannery after cooking indicated no significant difference in the occurence of honeycombing between frozen and iced fish; however, there was a highly significant difference between frozen fish and those kept in sea water. Among those kept in sea water for 15 hours without refrigeration, 90 percent were found to be honeycombed when processed at the cannery; of those refrigerated immediately after capture, 2 percent were honeycombed. Thus, honeycombing was produced by improper refrigeration.

* * * * *

ANNUAL REPORT, JULY 1, 1953, to JUNE 30, 1954: Research by the Service's Pacific Oceanic Fishery Investigations on the four major projects continued during the past fiscal year with changes in emphasis. The initial phase of locating and describing the yellowfin tuna stocks near the equator ended and commercial fishing on a limited scale began. Results of the equatorial and commercial fishing studies are being published.

Increased effort was expended on sea work and laboratory study of the Hawaiian skipjack tuna problem. Concurrent research on the reaction of tuna to artificial stimuli both in ponds and at sea continued. The phase of the study dealing with the reaction of tuna to chemical stimuli was completed and the study of visual stimuli was begun with observations being made primarily at sea.

A hydrographical and biological reconnaissance of the region north of Hawaii was carried out in cooperation with the State of California; two POFI vessels explored the region north of Hawaii while California vessels covered the area intervening between the POFI and the mainland coast. This survey will be the basis of a program of study designed to locate and describe albacore tuna fishing grounds in the subtropical Pacific now being planned as a cooperative research project by various Pacific Coast fisheries agencies and POFI.

Sea work during the year included 5 cruises in equatorial waters, 1 of which passed through the Marquesas, Tuamotu, and Society Islands; 6 cruises were made in Hawaiian waters to study the features of ocean circulation affecting the distribution of tuna schools and to delineate the distribution from inshore island waters to about 1,000 miles offshore; 2 survey cruises were made in the potential albacore waters north of Hawaii; and 1 local cruise tested new designs in fishing gear and oceanographic equipment.

Tuna Abunbance in Central Pacific: The abundance of tuna in central Pacific equatorial waters has been estimated, the limits of the yellowfin tuna resource located near the equator south of Hawaii have been defined, and the relationships between tuna and the ocean currents have been more accurately described. The past year's cruises have substantiated earlier findings that the region between 0° and 5° N. latitude and about 140° and 165° W. longitude consistently yields the highest catch rate of tuna on experimental gear. The all-time average catch rate within this zone of best fishing is 6.8 yellowfin per 100 hooks, with a range of averages from 3.4 to 11.7 yellowfin tuna per 100 hooks for the best 4° of latitude on each of 11 fishing sections crossing the equator. One cruise of the Charles H. Gilbert this past year along 110° W. longitude increased the knowledge of the easterly extent of the band of yellowfin tuna at the equator. Although the catch rate on 110° at the 5 best stations was only 2.6 yellowfin per 100 hooks, this cruise, with previously collected data on 120° W. longitude, proved that yellowfin tuna extend continuously along the equator from 180° east to the American continent. Japanese commercial fishing west of 180° shows that they also extend continously to Asia.

Because POFI cruises to the equator are intermittent, seasonal differences have been difficult to assess. During 1953, 4 cruises at different times of the year showed catch rates as follows:

	Jan.-Feb.	May	July-Aug.	Dec.
Number of fishing stations ..	4	4	5	5
Avg. yellowfin tuna catch/100 hooks	2.4	5.5	7.3	1.6

These data indicate more clearly than previous years' records that the best catches occur during late summer.

The effects of islands upon the distribution of yellowfin tuna near the equator was studied this past year. Cruises designed to test this feature produced catching rates 1.8 times better around the islands than in the open ocean. The catch rate of the medium and larger fish was about the same on both types of lo-

cations. The increase was attributable to the presence of the small surface-schooling yellowfin tuna around the islands in addition to the ever-present adults found at middepths, regardless of nearness to islands.

The data from all equatorial oceanographic cruises are being assembled to determine the geographic and seasonal distribution of physical and chemical properties in the mid-Pacific equatorial region. Data from oceanographic cruises by other activities (such as the research vessels Shellback, Carnegie, Albatross, and Galathea) are being included in order to supplement POFI data and to extend the geographical coverage.

Preliminary examination suggests that along the equator from 110° W. (the eastern limit of available data) to about 155°-160° W. there is a gradual deepening of the thermocline from near the surface to 400-500 feet, but from 155°-160° W. to 165° E. there is little change in thermocline depth. All properties studied thus far demonstrate that the region between 155° W. to 160° W. is a transition zone between the eastern and western areas of the sector under study. Several biological indices support the idea that the ecological conditions in the eastern half may differ from those in the western half of the section.

With the cooperation of the U. S. Weather Bureau, a field station with meteorological instruments and two sea temperature thermographs was set up on Christmas Island. The recording thermometers have been difficult to keep in operation but have functioned over long enough periods to give records of surface water temperature variation. The accompanying weather data is expected to show the causes of the variation.

Tuna Biology Studies: Studies of the biology of tunas have continued. The big-eyed tuna (P. sibi) spawns in the equatorial Pacific Ocean at a minimum size of about 20 pounds. Maturing females were found during most months of the year in equatorial waters, but none of the fish taken in Hawaiian waters were as advanced as the equatorial big-eyed tuna in spawning condition. From 2.9 to 6.3 million eggs are estimated to be released during one spawning, and there is evidence that these tuna spawn more than once per season.

A detailed description of the various tuna larvae found in central Pacific waters has been completed and a report of this work is in preparation. The distribution of the tuna larvae in equatorial waters closely parallels that of zooplankton, with both skipjack tuna and yellowfin tuna larvae, the predominant tuna species in the plankton, being found in greatest abundance in the central Pacific from 5° S. to about 8° N. latitude and from 120° W. longitude to 180°. The larvae seem to be equally abundant from about 140° W. longitude to 180°, a distance of about 2,500 miles. Despite the fact that experimental fishing in equatorial waters produces preponderantly adult yellowfin tuna, over three times as many skipjack tuna larvae as yellowfin tuna larvae are taken in the quantitative plankton tows. It is obvious that the sampling methods are not accurately measuring the skipjack tuna populations, either in scouting or long-line fishing. Large stocks of skipjack tuna must spawn near the equator, and at this time it is only conjectural whether or not these spawning stocks contribute to existing commercial skipjack tuna fisheries elsewhere.

Analyses of both yellowfin tuna and big-eyed tuna length- and weight-frequency data for evidences of age and growth are being completed. Big-eyed tuna weight data from the commercial "ahi" fishery of the Hawaiian Islands indicate that they apparently do not spawn every year. An annual alternation of size groups occurs, the same modal size appearing in the Hawaiian fishery every other year. Growth, measured from the progression of the frequency modes, appears to average about 40 pounds each year, with good evidence that 7-year-old fish are about the oldest distinct age group to occur in the Hawaiian Islands.

Yellowfin tuna length frequencies from equatorial waters show two distinct modes which occur in about the same position in samples collected throughout the year. This consistency in modal sizes has prevailed more or less regularly through the three years since experimental long-line fishing in central Pacific equatorial waters began in earnest. No progression

of modes can be found during succeeding seasons of the year. One explanation for this lack of progression might be that ingress and egress of the two size groups of yellowfin tuna in the middepths sampled by the long lines are relatively constant. Where the fish come from and where they go after leaving this environment is highly speculative, but it is not difficult to imagine that the equatorial belt of favorable environment is only a temporary stopover in some, as yet unknown migratory pattern.

Commercial Fishing Trips To Equatorial Waters: Two commercial fishing trials to equatorial waters were completed and a third began during the past year. Two West Coast fishing vessels, Alrita and North American, under contract with POFI, completed two long-line fishing trips to the Line Islands region south of Hawaii between late February and mid-May, fishing a total of 121 boat-fishing days and catching 210 tons of yellowfin tuna, averaging 4.75 yellowfin per 100 hooks. The cruise may be considered a successful commercial trial, despite some difficulty in marketing the "offcolor" fish and continuous trouble with broken fishing gear. The line used for the hook droppers by these boats proved too light for continuous use and many fish were lost.

An equatorial fishing trip in April by a local sampan, Taihei Maru, was not successful owing to mechanical difficulties and inadequate refrigeration. Forty baskets of long-line gear were fished for 5 days in the vicinity of Palmyra and caught only $2\frac{1}{2}$ tons of yellowfin. The gear was retrieved by hand without benefit of a power winch because of mechanical failures.

This past year a most significant move in the commercial development of the equatorial fishing grounds south of Hawaii has occurred. A Pacific Northwest fishing company is undertaking development of Palmyra Island as a fishing outport for tuna long-line boats. Three vessels from the West Coast are now fishing near Christmas Island with steel long lines. Early reports indicate discouragingly low catch rates, which may be due to their use of the new and as yet unproven steel fishing gear.

Another Honolulu-based fishing boat, Sea Hawk, is now making ready for a long-lining trip to the Line Islands region. This vessel will use the conventional cotton gear and have experienced Hawaiian long-line fishermen aboard.

Steel Long-Line Gear: Realizing the importance of improving the long-line gear for efficient use aboard United States vessels, POFI personnel are experimenting with steel cable for the main line, with the gear wound on metal spools and set and retrieved with a modified Rowe halibut winch. Several devices for mechanically attaching the hook-droppers have been tried and one, a so-called "straphanger" attachment, shows much promise. The function of the "straphanger" is to attach the baited hook-droppers automatically as the steel main line is being set, eliminating the delay caused by stopping the winch to attach the droppers by hand. As yet a speedy and efficient way of setting and hauling this gear which would reduce the time required below that of the presently-used cotton long lines has not been devised.

Plankton Abundance Analyzed: Analyses of plankton abundance in the equatorial region continued. Although there are slight changes only in weather from one time of the year to another, there is considerable seasonal variation in plankton abundance. The period from January through March ranked low in standing crop of plankton for most longitudes sampled, while July, August, and September, almost without exception, marked the period of greatest production. Considering the east-west variation, data show a gradient of increasing plankton abundance from west to east, with a tendency toward a leveling-off east of 140° W. As in past analyses, zooplankton was found most abundant between the equator and 4° N. Samples taken at three depths--the surface, the level of the 70° isotherm (within the thermocline), and 200 meters--indicated a significant increase in plankton in the surface layers during the night. But the greatest concentrations of plankton occurred in the surface layers during both the day and night. Thus, there was no evidence of a concentrated layer of plankton at the level of the thermocline at the equator. Copepods were by far the most abundant group present in the

samples, followed by foraminifers, invertebrate eggs, tunicates, gastropods, chaetognaths, radiolarians, crustacean larvae, ostracods, euphausiids, siphonophores, and amphipods, respectively.

Live-Bait Survey: A live bait survey was made of the Marquesas and Tuamotu Islands by the Charles H. Gilbert. Live bait was quite plentiful in the small bays and along the rocky shores of the Marquesas Islands. A total of about 3,000 buckets of bait, primarily a sardine-like fish, was located and 365 buckets were taken in 2 days of scouting. In the atolls of the Tuamotus, however, there was little evidence of worthwhile concentrations of tuna bait at the four atolls surveyed.

Skipjack Tuna Distribution: Studies of the distribution of Hawauuab skipjack tuna and environmental factors affecting their movements continued. Six scouting cruises were carried out in 1953 in conjunction with six scouting flights in U. S. Navy PBY amphibian planes. Airplane scouting found far fewer fish schools per unit of distance covered than did vessel scouting. The principal reasons for this are the prevailing choppiness of Hawaiian waters and the difficulty of seeing dark-colored birds--which make up the bulk of the school-accompanying bird flocks--against the deep blue water. The Hawaiian skipjack tuna fleet obtains three-fourths of its catch within 20 miles of land, but tuna schools were seen on our scouting cruises in equal numbers per unit area several hundred miles from the islands.

Hydrographic studies in Hawaiian waters revealed a semipermanent eddy system in the lee waters of the archipelago. These eddies exhibit seasonal fluctuations, being well developed during periods of strong, continuously blowing trade winds. The circulation features in the windward offshore waters are complicated and as yet little understood. Scouting revealed noteworthy concentrations of skipjack tuna schools around the periphery of the eddies, about 100 miles offshore and outside the range of the local fishery. Tagging of skipjack tuna commenced with the plastic tube tag developed in California, and thus far 22 have been released, primarily outside the range of the local fishery. The migrations of the fish around the islands will be traced by this means.

Artificial Tuna Bait: The search for an artificial tuna bait continued with both pond studies as well as sea tests with research vessels. Further tests of chemical attractants in the ponds continued to show a pronounced feeding reaction of the tuna to the colorless tuna extracts. However, sea tests failed to produce a noticeable reaction in skipjack tuna schools from these attractants. Subsequent visual tests have proved that an artificial bait must be attractive in appearance and exhibit motion before tuna schools will show a marked and continuous positive reaction. Studies are now being carried on to develop a self-propelled lure which will be attractive in appearance and contain a chemical attractant as well.

Albacore Tuna Reconnaissance Cruises: A reconnaissance by two research vessels last winter give encouraging evidence of a rich biota and a possible concentration of albacore tuna north of the Hawaiian Islands. Preliminary plots of vertical temperature sections and of horizontal distribution of temperature and inorganic phosphate reveal that the northern edge of the North Equatorial Current was near 35° N. latitude. Between 30° and 35° N. there was a region of considerable mixing, while north of 35° N. lay the colder waters of the easterly flowing North Pacific Drift. Within the region of mixing, near its northern edge, the John R. Manning took 42 large albacore tuna in one day's long-line set. Small numbers of albacore tuna were taken at two other locations during the cruise, but a severe storm prevented completion of the planned fishing survey.

States Get Over $4 Million for Fish Restoration

The popularity of new types of sport-fishing equipment sold during fiscal year 1954 resulted in the sum of $4,422, 800 in Federal Aid funds being made available to the 48 states for sport fishery restoration projects during fiscal year 1955, Acting Secretary of the Interior Tudor announced August 20. This is an increase of $122,884, compared to last year's apportionment of $4,299,916.

These Federal funds become available to the States under the terms of the Federal Aid in Fish Restoration Act of August 9, 1950, probably better known as the "Dingell-Johnson Act." This program, now in its fourth year of operation, is enabling the States to create new public fishing lakes, restore many unproductive waters, and put research findings to better use.

The revenue for the Federal share of the program comes from the 10-percent excise tax on fishing rods, creels, reels, and artificial lures, baits, and flies, paid by the manufacturers. Collections from this source during the year ended June 30, 1954, totaled $4,625,338. From this total is taken the annual apportionments of $75,000 to Alaska, $25,000 to Hawaii, $10,000 to the Virgin Islands, and the cost of administering the act by the U. S. Fish and Wildlife Service.

To provide a fair distribution of Federal funds, each State's share is based on the relation of the number of its paid fishing license holders to the total in all States, and the ratio of each State's area (including coastal and Great Lakes waters) to the area of the entire country.

The Act also states "that no State can receive less than one percent nor more than five percent of the total apportioned to all States." This provision allows the small States enough working capital to finance comparatively big projects, while the large States will be able to receive only the maximum amount. On this basis California, Michigan, and Minnesota are given the maximum apportionment this year of $221,140 each, while Connecticut, Delaware, Louisiana, Maryland, Massachusetts, New Hampshire, New Jersey, Rhode Island, Vermont, and West Virginia will receive the minimum of $44,228 each.

To obtain the benefits of the Federal grants, the States submit project proposals to the Fish and Wildlife Service. Acting for the Secretary of the Interior, the Service reviews these proposals to learn whether they are substantial in character and design within the meaning of the Act. When a project is approved, the State game and fish departments proceed to carry out the plans, spending their own funds. The States then submit reimbursement claims for 75 percent of the costs of the project, either periodically or at the completion of the work. The remaining 25 percent of project expenditures is financed out of regular state funds. All equipment, lands, and structures become the property of the States. All project workers are hired by the States and are State employees.

Apportionments to the 48 states for fiscal year 1955 are as follows:

Alabama	$57,785	Georgia	$88,062	Maine	$47,697
Arizona	73,701	Idaho	77,356	Maryland	44,228
Arkansas	85,718	Illinois	154,490	Massachusetts .	44,228
California	221,140	Indiana	101,448	Michigan	221,140
Colorado	108,340	Iowa	81,305	Minnesota	221,140
Connecticut	44,228	Kansas	83,060	Mississippi	50,402
Delaware	44,228	Kentucky	87,426	Missouri.....	130,340
Florida	81,052	Louisiana	44,228	Montana	105,883

Nebraska	$70,389	Ohio	$141,308	Texas	$192,805
Nevada	62,625	Oklahoma	97,191	Utah	63,168
New Hampshire ..	44,228	Oregon	94,963	Vermont	44,228
New Jersey	44,228	Pennsylvania ...	137,715	Virginia	71,186
New Mexico	77,373	Rhode Island ...	44,228	Washington ...	105,139
New York	148,157	South Carolina ..	56,952	West Virginia .	44,228
North Carolina ...	77,894	South Dakota	57,487	Wisconsin	190,591
North Dakota	46,663	Tennessee	134,700	Wyoming	76,730

U. S. Canned Packs of Selected Fishery Products, 1953

MACKEREL: The United States canned mackerel pack (including jack mackerel) in 1953 amounted to 596,321 standard cases, valued at $5,038,512 to the packers (table 1). This was a decrease of 61 percent in quantity and 56 percent in value as compared with 1952. In 1953 mackerel was canned by 26 plants in California and 2 in Massachusetts.

Table 1 - U. S. Canned Mackerel Pack, by States and Style of Pack, 1953[1/]

Style of Pack and State	Quantity	Value to Canners	Canners' Avg. Price Per Std. Case[3/]
	Std. Cases[3/]	$	$
Natural, California and Massachusetts	550,927	4,561,848	8.28
In tomato sauce, California[2/]	45,394	476,664	10.50
Total	596,321	5,038,512	8.45

1/Includes the pack of jack mackerel in California.
2/Includes a small pack in special sauce.
3/Cases of various sizes converted to the equivalent of 48 1-pound cans to the case, each can containing 15 ounces.

The bulk (98 percent) of the mackerel canned was put up in 15-ounce cans and packed 48 cans to the case (table 2).

Table 2 - U. S. Canned Mackerel Pack, by Size of Container, 1953[1/]

Can and Case Size	Quantity	Value to Canners	Canners' Avg. Price Per Std. Case
	Actual Cases	$	$
15 ounces net (48 cans)	588,938	4,909,509	8.34
7½ ounces net (48 cans)	12,204	116,495	9.55
Other sizes (converted to standard cases)	1,281	12,508	9.76
Total	602,423	5,038,512	-

1/Preliminary.

The 1953 production of 596,321 standard cases was the smallest pack that has been reported since 1932 when the pack was 94,723 standard cases (table 3). The largest production on record was in 1947 when 1,754,950 standard cases were packed, valued at $15,018,633. The last previous pack of mackerel to fall below one million cases was in 1946. The decline in production in 1953 was attributed to a failure of both Pacific and jack mackerel to appear in normal quantities.

Table 3 - U. S. Canned Mackerel Pack, 1943-53

Year	California			Atlantic Coast			Total		
	Quantity	Value to Canners	Canners' Avg. Price Per Std. Case[1]	Quantity	Value to Canners	Canners' Avg. Price Per Std. Case[1]	Quantity	Value to Canners	Canners' Avg. Price Per Std. Case[1]
	Std. Cases[1]	$	$	Std. Cases[1]	$	$	Std. Cases[1]	$	$
1953	2/596,321	2/5,038,512	8.45	2/	2/	2/	596,321	5,038,512	8.45
1952	1,503,233	11,110,276	7.39	22,120	252,421	11.41	1,525,353	11,362,697	7.45
1951	1,032,581	6,066,011	5.87	15,937	193,213	12.12	1,048,518	6,259,224	5.97
1950	1,393,492	6,959,616	4.99	63,556	532,200	8.37	1,457,048	7,491,816	5.14
1949	916,810	5,766,415	6.29	133,117	1,082,515	8.13	1,049,927	6,848,930	6.52
1948	1,018,973	7,541,931	7.40	262,219	2,308,903	8.81	1,281,192	9,850,834	7.69
1947	1,477,198	12,571,059	8.51	277,752	2,447,574	8.81	1,754,950	15,018,633	8.56
1946	723,688	5,599,894	7.74	238,462	1,975,397	8.28	962,150	7,575,291	7.87
1945	638,191	3,590,614	5.63	54,557	456,077	8.36	692,748	4,046,691	5.84
1944	992,280	5,096,749	5.14	232,780	1,937,248	8.32	1,225,060	7,033,997	5.74
1943	831,660	4,379,996	5.27	105,591	891,207	8.44	937,251	5,271,203	5.62

1/Cases of various sizes converted to the equivalent of 48 1-pound cans to the case, each can containing 15 ounces.
2/A small production of the Atlantic Coast has been included with that of California.

The canners' average price for 1953 was $8.45--substantially higher than for any year since 1947 when the average price was $8.56 per standard case. The price in 1953 was the second highest on record.

U. S. Production of Selected Byproducts, 1953

ANIMAL FOOD FROM FISHERY PRODUCTS: The 1953 pack of canned animal food from fishery products in the United States amounted to 3,881,245 standard cases, valued at $17,348,052, or an average price of $4.47 per standard case to the canner (table 1). This is the largest pack in the history of the industry--11 percent

Table 1 - U. S. Pack of Canned Animal Food From Fishery Products by States, 1953[1]

State	Quantity	Value to Canners	Canners' Avg. Price Per Std. Case[2]
	Std. Cases[2]	$	$
Maine and Massachusetts	1,936,964	7,489,824	3.87
New York, New Jersey, Pennsylvania, Illinois, and Tennessee	258,387	1,016,858	3.94
Maryland, Virginia, and Mississippi	559,629	2,928,740	5.23
Washington	34,400	133,300	3.88
California	1,091,815	5,778,955	5.29
Alaska	50	375	7.50
Total	3,881,245	17,348,052	4.47

1/Preliminary.
2/Cases of various sizes converted to the equivalent of 48 cans, each can containing 16 ounces.

greater in quantity and value than in 1952. California produced 28 percent of the pack, Maine and Massachusetts 50 percent, and other states 22 percent. Animal

Table 2 - U. S. Pack of Canned Animal Food From Fishery Products by Size of Can and Case, 1953[1]

Can and Case Size	Quantity	Value to Canners	Canners' Avg. Price Per Case
	Actual Cases	$	$
6-ounces net (48 cans)	28,321	61,753	2.18
8-ounces net (48 cans)	2,307,437	6,005,027	2.60
16-ounces net (48 cans)	2,707,730	11,232,558	4.15
Other sizes (converted to standard cases)	9,177	48,714	5.31
Total	5,052,665	17,348,052	-

1/Preliminary.

food from fishery products was canned in 14 plants in California, 7 in Massachusetts, 3 in Washington, 2 plants each in Maine and Mississippi, and 1 plant each in New York, New Jersey, Pennsylvania, Illinois, Tennessee, Maryland, Virginia, and Alaska.

About 46 percent of the 1953 pack of animal food from fishery products was packed in the 8-ounce can, over 53 percent in the 16-ounce can, and less than 1 percent in containers of other sizes (table 2).

Table 3 - U. S. Pack of Canned Animal Food From Fishery Products, 1948-1953

Year	Quantity	Value to Canners	Canners' Avg. Price Per Std. Case 2/
	Std. Cases 2/	$	$
1953 1/	3,881,245	17,348,052	4.47
1952	3,497,733	15,667,809	4.48
1951	2,341,871	11,675,950	4.99
1950	2,721,393	13,870,870	5.10
1949	1,931,757	8,663,442	4.48
1948	1,323,808	6,971,003	5.27

1/Preliminary.
2/Cases of various sizes converted to the equivalent of 48 cans, each can containing 16 ounces.

The canning of animal food from fishery products has showed a steady increase since 1948, while the average price per standard case has fluctuated only slightly from year to year (table 3).

* * * * *

SCRAP AND MEAL: Production of marine-animal scrap and meal in the United States and Alaska in 1953 amounted to 238,851 short tons, valued at $29,559,653 to the manufacturers (table 1). This represents an increase of 8 percent in volume and 9 percent in value as compared with the previous year. Atlantic and Gulf Coast plants produced 87 percent of the scrap and meal due to a record production of menhaden scrap and meal.

Table 1 - U. S. and Alaska Marine-Animal Scrap and Meal Production by Types, 1953 1/

Product	Atlantic and Gulf Coasts 2/			Pacific Coast and Alaska			Total	
	Quantity	Value to Mfgrs.	Avg. Price Per Short Ton	Quantity	Value to Mfgrs.	Avg. Price Per Short Ton	Quantity	Value to Mfgrs.
	Short Tons	$	$	Short Tons	$	$	Short Tons	$
Meal and dried scrap:								
Anchovy	-	-	-	688	88,488	129	688	88,488
Crab, blue	8,436	502,187	60	-	-	-	8,436	502,187
Crab, Dungeness	-	-	-	290	16,195	55	290	16,195
Fur seal	-	-	-	353	27,682	78	353	27,682
Groundfish (white fish) inc. ocean perch	16,350	2,298,538	141	-	-	-	16,350	2,298,538
Herring	3,005	365,547	122	2,201	351,925	160	5,206	717,472
Menhaden	174,752	21,767,205	-	-	-	-	174,752	21,767,205
Pilchard	-	-	125	144	18,966	131	144	18,966
Salmon	-	-	-	1,492	185,342	124	1,492	185,342
Shrimp	1,000	80,036	80	-	-	-	1,000	80,036
Tuna and mackerel	-	-	-	20,029	2,622,631	131	20,029	2,622,631
Miscellaneous	3,187	389,399	122	6,924	845,512	122	10,011	1,234,911
Total	206,730	25,402,912	123	32,121	4,156,741	130	238,851	29,559,653

1/ Preliminary.
2/ Includes a small production of miscellaneous meal produced in Minnesota.

Menhaden scrap and meal accounted for 73 percent of the production. The yield of pilchard meal, which for many years was the principal meal produced, amounted to only 144 tons. The record yield of pilchard meal occurred in 1936 when 121,739 short tons were produced.

The 1953 yield of scrap and meal was slightly below the 1936 record production of 243,778 tons and the 239,924 tons produced in 1950 (table 2).

Table 2 - U. S. and Alaska Marine-Animal Scrap and Meal Production, 1943-53

Year	Dry Scrap and Meal			Acid Scrap			Total	
	Quantity	Value to Mfgrs.	Avg. Price Per Short Tons	Quantity	Value to Mfgrs.	Avg. Price Per Short Ton	Quantity	Value to Mfgrs.
	Short Tons	$	$	Short Tons	$	$	Short Tons	$
1953 2/	238,851	29,559,653	-	-	-	-	238,851	29,559,653
1952	1/221,403	1/27,161,654	123				221,403	27,161,654
1951	1/209,756	1/25,373,897	121				209,756	25,373,897
1950	1/239,924	1/29,252,355	122	1/	1/	1/	239,924	29,252,355
1949	1/237,180	1/35,652,142	150				237,180	35,652,142
1948	1/199,519	1/23,086,734	116				199,519	23,086,734
1947	185,808	22,353,488	120	632	26,863	43	186,440	22,380,351
1946	197,599	20,360,943	103	2,022	78,475	39	199,621	20,439,418
1945	199,118	14,343,138	72	1,557	62,200	40	200,675	14,405,338
1944	210,225	15,131,918	72	2,922	111,104	38	213,147	15,243,022
1943	188,848	13,570,331	72	1,555	58,821	38	190,403	13,629,152

1/ A small production of acidulated menhaden scrap has been included with dry scrap and meal for 1948-1952.
2/ Preliminary.

* * * * *

OILS: The 1953 production of marine-animal oils in the United States and Alaska amounted to 20,294,118 gallons, valued at $11,481,906 to the manufacturers--an

Table 1 - U. S. and Alaska Production of Marine-Animal Oils, 1953 1/

Product	Atlantic and Gulf Coasts 2/			Pacific Coast and Alaska			Total	
	Quantity	Value to Mfgrs.	Avg. Price Per Gallon	Quantity	Value to Mfgrs.	Avg. Price Per Gallon	Quantity	Value to Mfgrs.
	Gallons	$	$	Gallons	$	$	Gallons	$
Body Oil:								
Anchovy	-	-	-	81,922	35,062	.43	81,922	35,062
Fur seal	-	-	-	46,800	23,292	.50	46,800	23,292
Herring	191,787	89,947	.47	526,845	270,586	.51	718,632	360,533
Menhaden	17,824,477	8,806,317	.49	-	-	-	17,824,477	8,806,317
Pilchard	-	-	-	13,128	6,402	.49	13,128	6,402
Salmon 3/	-	-	-	217,196	165,506	.76	217,196	165,506
Tuna and mackerel	-	-	-	659,176	314,586	.48	659,176	314,586
Miscellaneous	4/ 347,638	4/ 253,281	.73	5/ 180,818	5/ 80,300	.44	528,456	333,581
Total	18,363,902	9,149,545	.50	1,725,885	895,734	.52	20,089,787	10,045,279
Liver and viscera oil:								
Cod	113,710	102,004	.90	-	-	-	113,710	102,004
Shark	6/	-	-	26,508	402,423	15.18	26,508	402,423
Tuna	6/	-	-	2,971	57,514	19.36	2,971	57,514
Miscellaneous	7/ 1,748	7/ 189,638	108.45	8/ 59,394	8/685,048	11.53	61,142	874,686
Total	115,458	291,642	1.67	88,873	1,144,985	12.88	204,331	1,436,627
Grand total	18,479,360	9,441,187	.51	1,814,758	2,040,719	11.25	20,294,118	11,481,906

1/ Preliminary.
2/ Includes production of burbot-liver oil in Minnesota.
3/ Includes edible and industrial salmon oil.
4/ Includes ocean perch and unclassified body oils.
5/ Includes unclassified body oils.
6/ Combined with Pacific Coast production.
7/ Includes burbot, flounder, hake, halibut, pollock, swordfish, whale, mixed, and unclassified liver oils.
8/ Includes halibut, sablefish, swordfish, and mixed liver oils, and viscera oil.

increase of 26 percent in volume and 22 percent in value as compared with the previous year (table 1). The Atlantic and Gulf Coast states produced 91 percent of the total oils, the Pacific Coast and Alaska the remainder. Menhaden oil accounted for 88 percent of the total quantity produced. The production of menhaden oil was the largest ever, while the value of liver oils declined sharply.

Body oils obtained from whole fish and fish waste accounted for 99 percent of the quantity and 87 percent of the value, and the remainder of the production consisted of liver and viscera oils.

The marine-animal oil produced in the United States and Alaska during 1953 was 26 percent more in quantity and 22 percent higher in value than in 1952 (table 2).

Table 2 - U. S. and Alaska Production of Marine-Animal Oils, 1944-53

Year	Body Oils			Liver Oils			Total	
	Quantity	Value to Mfgrs.	Avg. Price Per Gallon	Quantity	Value to Mfgrs.	Avg. Price Per Gallon	Quantity	Value to Mfgrs.
	Gallons	$	$	Gallons	$	$	Gallons	$
1953 1/	20,089,787	10,045,279	.50	204,331	1,436,627	7.03	20,294,118	11,481,906
1952	15,817,800	7,316,354	.46	276,609	2,075,014	7.50	16,094,409	9,391,368
1951	17,872,733	14,044,296	.79	299,575	2,579,347	8.61	18,172,308	16,623,643
1950	21,432,592	14,041,619	.66	331,257	3,431,090	10.36	21,763,849	17,472,709
1949	16,860,530	7,519,522	.45	834,357	9,845,455	11.80	17,694,887	17,364,977
1948	16,323,061	18,449,870	1.13	722,329	12,411,652	17.18	17,045,390	30,861,522
1947	15,900,382	20,107,194	1.26	832,510	11,643,468	13.99	16,732,892	31,750,662
1946	19,135,051	21,223,098	1.11	895,884	13,618,549	15.20	20,030,935	34,841,647
1945	23,697,564	16,033,515	.68	804,288	11,202,207	13.93	24,501,852	27,235,722
1944	27,324,173	17,771,346	.65	998,802	13,237,435	13.25	28,322,975	31,008,781

1/ Preliminary.

Prices received for body oils were slightly higher, but the prices for liver oils were lower than the previous year. There has been a particularly sharp decline in recent years in the price of liver oils--the $7.03 per gallon average received by the manufacturers in 1953 was 59 percent lower than the $17.18 per gallon in 1948.

* * * * *

MARINE PEARL-SHELL BUTTONS: United States production of marine pearl-shell buttons in 1953 amounted to 4,612,153 gross, valued at $7,403,894 to the manufacturers (table 1). This was an increase of 3 percent in quantity and 7 percent in value as compared with 1952. Manufacturers received an average of $1.60 per

Table 1 - U. S. Production of Marine Pearl-Shell Buttons by States, 1953 1/

State	Quantity	Value to Mfgr.	Avg. Price Per Gross
	Gross	$	$
New York	1,043,341	1,840,418	1.76
New Jersey	1,017,599	1,957,554	1.92
Connecticut, Pennsylvania, and Maryland	2,507,519	3,536,436	1.41
Iowa	43,694	69,486	1.59
Total	4,612,153	7,403,894	1.60

1/Produced principally from imported shells. Preliminary.

gross for their 1953 production, compared with an average of $1.54 in 1952 and $1.29 in 1943.

Marine pearl-shell buttons were manufactured during 1953 in 21 plants--3 each in New York and Iowa; 11 in New Jersey; 2 in Pennsylvania; and 1 each in Connecticut and Maryland.

Table 2 - U. S. Production of Marine Pearl-Shell Buttons, 1943-53

Year	Quantity	Value to Mfgr.	Avg. Price Per Gross	Year	Quantity	Value to Mfgr.	Avg. Price Per Gross
	Gross	$	$		Gross	$	$
1953 1/	4,612,153	7,403,894	1.60	1947	5,087,000	7,902,000	1.55
1952	4,481,456	6,905,104	1.54	1946	3,461,559	5,635,904	1.63
1951	4,665,285	7,714,846	1.65	1945	2,398,020	3,286,245	1.37
1950	5,803,641	9,239,018	1.59	1944	2,035,320	2,601,626	1.28
1949	4,089,712	6,782,281	1.66	1943	2,949,978	3,792,059	1.29
1948	4,974,073	8,587,011	1.73				

1/Preliminary.

* * * * *

OYSTER-SHELL PRODUCTS: The United States production of grit and agricultural lime from oyster-shell products in 1953 totaled 466,732 tons, valued at $3,830,276 to the manufacturers (table 1). This was an increase of 9 percent in quantity and 14 percent in value as compared with 1952. No clam shells were used in 1953.

Crushed-shell products were prepared in 27 plants--4 each in Pennsylvania and Washington; 3 each in New Jersey, Virginia, and California; 2 each in Maryland, North Carolina, and Texas; and 1 plant each in Alabama, Florida, Louisiana, and Oregon.

Feeding fish meal to poultry.

Table 1 - U. S. Production of Oyster-Shell Products by States, 1953 1/

State	Crushed Shells for Poultry Feed		Unburned Shell Lime		Burned Shell Lime		Total	
	Quantity	Value To Mfgr.	Quantity	Value To Mfgr.	Quantity	Value To Mfgr.	Quantity	Value To Mfgr.
	Short Tons	$	Short Tons	$	Short Tons	$	Short Tons	$
New Jersey and Virginia	3,127	63,928	757	4,755	8,608	137,665	12,492	206,348
Pennsylvania and Alabama	48,513	487,900	35,486	113,281	-	-	83,999	601,181
Maryland, North Carolina, and Florida	64,525	826,672	17,361	101,369	-	-	81,886	928,041
Louisiana and Texas	233,134	1,648,582	26,167	96,087	-	-	259,301	1,744,669
Washington	3,059	57,158	1,212	7,751	-	-	4,271	64,909
Oregon and California	20,395	250,041	4,388	35,087	-	-	24,783	285,128
Total	372,753	3,334,281	85,371	358,330	8,608	137,665	466,732	3,830,276

1/Preliminary.

The average price per ton received by the manufacturers for the crushed shell for poultry feed in 1953 was $8.95--a record price (table 2). Prices paid for agricultural lime from marine shells in 1953 averaged $5.28 per ton, a decrease of 8 percent as compared with the 1952 price, and 25 percent below the record price of $7.00 per ton in 1949.

Table 2 - U. S. Production of Oyster and Marine Clam-Shell Products, 1942-1953

Year	Crushed Shells for Poultry Feed			Burned and Unburned Shell Lime			Total	
	Quantity	Value to Mfgr.	Avg. Price Per Ton	Quantity	Value to Mfgr.	Avg. Price Per Ton	Quantity	Value to Mfgr.
	Short Tons	$	$	Short Tons	$	$	Short Tons	$
1953 1/	372,753	3,334,281	8.95	93,979	495,995	5.28	466,732	3,830,276
1952 1/	356,431	2,939,718	8.25	72,917	419,306	5.75	429,348	3,359,024
1951	377,791	3,157,129	8.36	75,528	411,616	5.45	453,319	3,568,745
1950	344,300	2,625,896	7.63	55,075	320,557	5.82	399,375	2,946,453
1949	323,662	2,393,794	7.40	38,366	268,458	7.00	362,028	2,662,252
1948	296,570	2,140,705	7.22	48,505	333,787	6.88	345,075	2,474,492
1947	438,629	2,860,175	6.52	62,764	402,983	6.42	501,393	3,263,158
1946	329,717	1,913,584	5.80	60,716	357,269	5.88	390,433	2,270,853
1945	369,064	2,001,318	5.42	138,032	572,399	4.15	507,096	2,573,717
1944	458,080	2,684,306	5.86	124,135	450,390	3.63	582,215	3,134,696
1943	398,852	2,299,053	5.76	110,433	521,933	4.73	509,285	2,820,986
1942	345,032	2,028,170	5.88	121,005	554,091	4.58	466,037	2,582,261

1/The entire production was from oyster shells.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JUNE 1954: United States imports of fresh, frozen, and processed edible fish and shellfish in June 1954 amounted to 70.7 million pounds (valued at $20.1 million), according to a Department of Commerce summary tabulation (see table). This was an increase of 2 percent in quantity and 10 percent in value as compared with May imports of 69.4 million pounds (valued at $18.2 million). Compared with a year earlier, June imports were up 14 percent in quantity and 11 percent in value.

United States Foreign Trade in Edible Fishery Products, June 1954 and Comparisons

Item	June 1954		June 1953		Year 1953	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	Million $	1,000 Lbs.	Million $	1,000 Lbs.	Million $
IMPORTS:						
Fish & shellfish: Fresh, frozen & processed 1/	70,665	20.1	62,087	18.1	724,656	193.2
EXPORTS:						
Fish & shellfish: Processed 1/ only (excluding fresh and frozen)	2,125	0.7	7,156	2.0	58,920	14.4

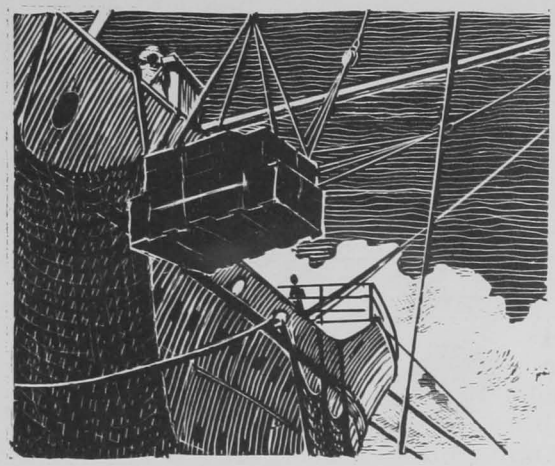
1/ Includes pastes, sauces, clam chowder and juice, and other specialties.
Source: United States Foreign Trade (Trade by Commodity), Summary Report FT 930, June 1954, U. S. Department of Commerce.

Exports of processed edible fish and shellfish (excluding fresh and frozen) in June 1954 totaled 2.1 million pounds (valued at $0.7)--a drop of 31 percent in quantity but unchanged in value as compared with May exports of 3.1 million pounds (valued at $0.7 million). June exports were down considerably from a year ago--70 percent in quantity and 65 percent in value.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-JUNE 1954: United States imports of principal fishery products during the first six months of 1954 were substantially higher than in the same period of 1953, according to preliminary information compiled by the U. S. Fish and Wildlife Service from data collected by the Bureau of Census.

Imports of fresh and frozen tuna totaled 63.3 million pounds for the first half of 1954--20.5 million pounds more than a year ago. Tuna-canned-in-brine imports of 16.9 million pounds were up 5.7 million pounds. But imports of tuna canned in oil for January-June 1954 of less than 1 million pounds were 2.4 million pounds below those for the first half of last year. On the other hand, bonito-canned-in-oil imports amounted to 9.9 million pounds, a gain of almost 3 million pounds over January-June 1953.



Canned salmon imports in the first six months of 1954 amounted to 10.7 million pounds as compared with 8.3 million pounds in the similar period of 1953. Canned sardines not in oil totaled 8.8 million pounds, a gain of 2.7 million pounds over the same period a year ago.

Imports of groundfish and ocean perch fillets and fish blocks of 59.7 million pounds for the first six months of 1954 were up 16.9 million pounds over the like period of 1953.

Fish-meal imports of 92,722 short tons during January-June 1954 were 16,468 tons larger than in the same period a year ago.

Imported in volume about equal to a year ago were fresh and frozen salmon, canned sardines in oil, shrimp, lobsters, crab meat, and fillets other than groundfish and ocean perch.

Although exports of fish oils declined heavily during June 1954, exports for the first six months of 1954 amounted to 66.7 million pounds as compared with 45.5 million pounds for the similar 1953 period.

Virginia

FISHERIES RESEARCH PROGRAM EXPANDED: As a result of the recommendations of the Tri-State Committee on Migratory Finfish, the Virginia General Assembly at its 1954 session increased substantially the research appropriation of the Virginia Fisheries Laboratory. Most of the new funds are earmarked for an intensified study of the croaker and the gray sea trout, once the leading food fishes in Virginia.

Two biologists have been added to the staff of the Virginia Fisheries Laboratory, and one or two others will be employed by next spring. Work under way at present is mainly exploratory in nature, to determine the best methods for obtaining adequate samples of the commercial and sport catch, and to set up a system for collecting biological catch records.

Funds also have been made available to the Virginia Laboratory for a new research vessel. It is expected that construction will begin in the fall of 1954 so that the new boat will be ready for the 1955 fishing season.

Wholesale Prices, August 1954

In spite of continued liberal production, a good demand again caused an over-all upward movement in August wholesale prices for fishery products. The August 1954 over-all edible fish and shellfish (fresh, frozen, and canned) wholesale index was 111.1 percent of the 1947-49 average (see table)--7.3 percent more than the July index and 3.1 percent above a year earlier.

Because of the tie-up of Boston's offshore fishing fleet, August ex-vessel prices for offshore drawn large haddock at Boston rose 35.3 percent above July and 11.8 percent above August 1953. Except for lower prices on fresh halibut and yellow pike at New York City, all other items under the drawn, dressed, or whole finfish subgroup were priced higher in August than in July. The index for the subgroup as a whole went up 12.6 percent from July to August and was 10.9 percent higher than in August 1953.

Fresh haddock fillets and shucked oyster prices rose substantially from July to August. The increase of 52.4 percent in the prices for fresh haddock fillets at Bos-

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1954 and Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ ($)		Indexes (1947-49=100)			
			Aug. 1954	July 1954	Aug. 1954	July 1954	June 1954	Aug. 1953
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					111.1	103.5	97.4	107.8
Fresh & Frozen Fishery Products:					120.1	2/109.8	98.8	115.9
Drawn, Dressed, or Whole Finfish:					134.3	2/119.3	98.1	121.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.16	.12	161.0	119.0	59.8	144.0
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.32	.34	99.0	106.0	100.6	94.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	158	.57	130.4	128.4	140.5	112.1
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.43	131.4	105.4	105.4	116.5
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.65	2/.59	131.4	2/119.3	91.0	111.2
Lake trout, domestic, No. 1, drawn, fresh.	Chicago	lb.	.53	.51	107.6	104.5	99.4	117.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.49	.61	114.9	143.0	89.1	132.5
Processed, Fresh (Fish & Shellfish):					107.1	98.7	100.7	113.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.34	.22	114.0	74.8	74.8	117.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.55	.59	85.9	93.3	94.8	109.1
Oysters, shucked, standards	Norfolk	gal.	5.25	4.50	129.9	111.3	114.4	117.5
Processed, Frozen (Fish & Shellfish):					93.9	97.6	97.6	100.8
Fillets: Flounder (yellowtail), skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	100.8	100.8	108.7
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.31	.32	95.7	100.4	100.4	89.3
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.29	111.8	116.8	116.8	95.1
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.52	.55	80.2	84.1	84.1	106.5
Canned Fishery Products:					97.7	94.2	95.4	95.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	case	19.70	18.70	104.4	99.1	99.1	100.4
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	case	13.25	13.05	95.5	94.1	95.5	92.4
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	case	6.70	6.50	71.3	69.2	74.0	76.6

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Revised.

ton was attributed to the tie-up of Boston's offshore fishing fleet, but prices for this product were still 2.9 percent lower than a year earlier. These increases were offset slightly by a drop of 7.9 percent in the price of fresh shrimp at New York City due principally to a liberal production. Fresh shrimp prices this August were 21.3 percent lower than in the same month of 1953. The subgroup index for fresh processed fish and shellfish in August was 8.5 percent above the previous month and down 5.6 percent from August 1953.

Liberal stocks of shrimp, haddock fillets, and halibut caused frozen processed fish and shellfish prices to drop 3.8 percent from July to August. The August subgroup index for these commodities was down 6.8 percent below the same month of 1953. Although August prices for frozen haddock and ocean perch fillets were lower than in the previous month, they were still substantially higher than in August 1953. On the other hand, shrimp prices this August were down 24.7 percent below August 1953.

Indications of a salmon pack only equal to that of 1953 and a Maine sardine pack somewhat smaller than a year ago boosted prices for these commodities in August. In spite of a liberal pack of tuna, prices went up slightly in August because the demand continued good. The canned fishery products subgroup index for August was 3.7 percent higher than the previous month and 1.9 percent above the same month a year ago.

RESTAURANT OPERATORS ADVISED ON FISH SUPPLIES

Fresh and frozen fish and shellfish and canned Maine sardines received nation-wide publicity in the September issue of Food Outlook for September, the monthly newsletter of the National Restaurant Association. The extent and importance of this trade news can be best appreciated by the fact that roughly one-half of the restaurant business in the country is done by the restaurants belonging to this association.

Because of the present large and potentially even greater volume market represented by the restaurant groups, the Service has maintained close cooperation with the national and many of the regional associations. The Service regularly sponsors a fishery display at the National Restaurant Association convention in Washington, D. C. Fishery trade groups can avail themselves of an excellent marketing opportunity by working closely with the state restaurant associations in their particular area.