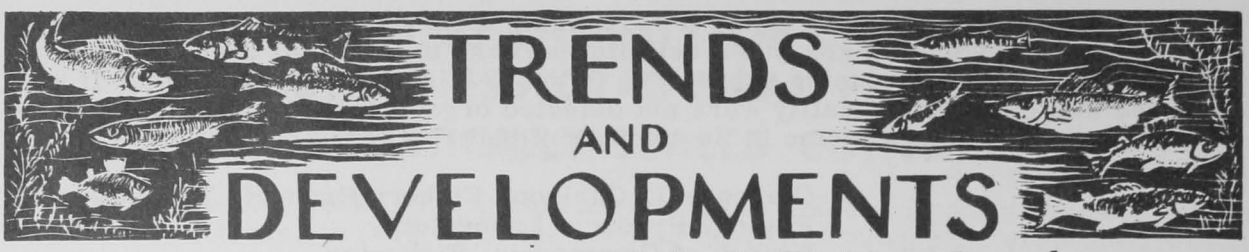



## Additions to the Fleet of U. S. Fishing Vessels

A total of 42 vessels of 5 net tons and over received their first documents as fishing craft during August 1954--14 less than in August 1953. Louisiana and Washington led with 7 vessels each, followed by Texas with 6 vessels, reports the U. S. Bureau of Customs.

Vessels Obtaining Their First Documents as Fishing Craft, August 1954 and Comparisons

| Section | August | | January-August | | Total 1953 |
|---|---|---|---|---|---|
| | 1954 | 1953 | 1954 | 1953 | |
| | Number | Number | Number | Number | Number |
| New England | - | - | 21 | 16 | 20 |
| Middle Atlantic | - | 2 | 13 | 15 | 19 |
| Chesapeake | 5 | 11 | 67 | 53 | 83 |
| South Atlantic | 6 | 7 | 83 | 69 | 116 |
| Gulf | 17 | 20 | 272 | 156 | 264 |
| Pacific | 12 | 9 | 88 | 139 | 164 |
| Great Lakes | - | - | 3 | 5 | 7 |
| Alaska | 2 | 6 | 22 | 43 | 53 |
| Hawaii | - | 1 | 1 | 2 | 3 |
| Unknown | - | - | 1 | - | - |
| Total | 42 | 56 | 571 | 498 | 729 |

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

## Air Force-Developed Odor Control May Be Useful in Fish-Processing Plants

The U. S. Air Force recently reported on extensive tests of agents for control of undesirable odors, but which are not dangerous to personnel, according to a Department of Commerce July 30 press release. Some of the conclusions cited may be of interest to fish processors and cold-storage warehouse operators. One of the agents, "ozone," appears to be of value as a purifying agent in cold-storage and food-storage spaces for the minimization of odor formation and the growth of microorganisms. Actual use for these purposes awaits the solution of practical problems of dissemination throughout the storage space. Among the advantages cited were ozone's universal ability to cancel bacteriologically-produced malodor of the amine type through oxidation and actual removal from the area.

Two new reports on this research by the Air Force were announced by the U.S. Department of Commerce:

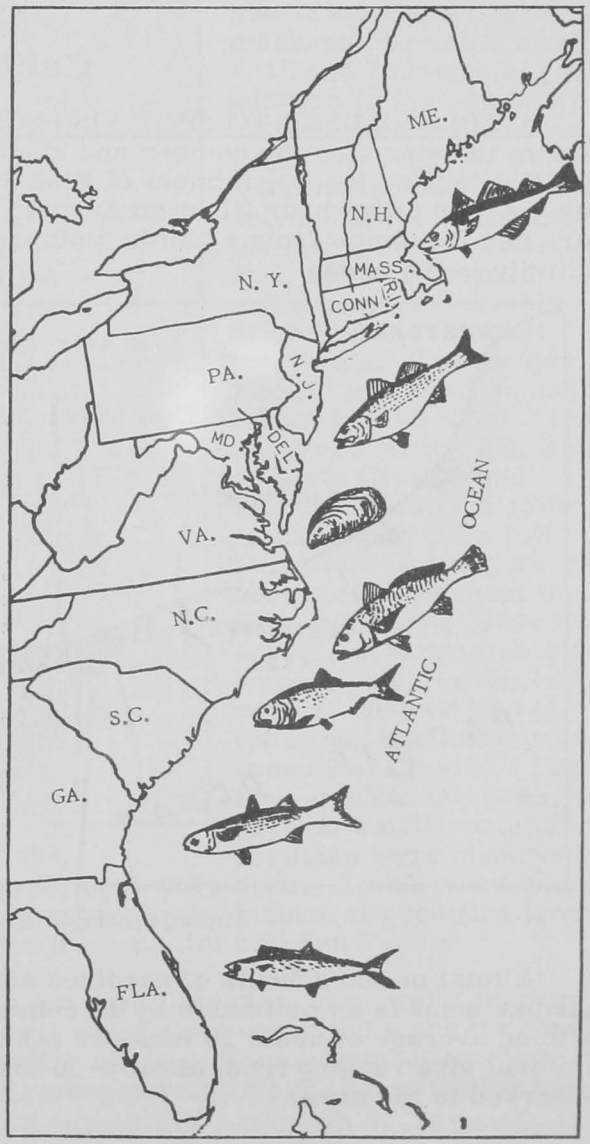
Control of Odor in Evacuation Aircraft, 1952, is a 47-page report, with charts and tables, and is available from U. S. Department of Commerce, Washington 25, D. C., at $1.00 per copy. This report explains that advances in the control of malodorous vapors in factory, hospital, or home appear possible as a result of Air

Force studies of methods of cancelling or masking odors from gangrenous wounds and other undesirable odors occurring in evacuation aircraft. Part 3 of this study indicates progress in the determination of effective control agents which are not harmful to personnel, are not themselves malodorous or persistent, and do not suppress "alarm" odors indicative of fire or mechanical trouble, such as gas vapor, scorched paint odor, and the odor of hot motor oil.

Odor Control for Air Evacuation Aircraft, 1952, is an 86-page report, with tables, charts, and diagrams. Available from U. S. Department of Commerce, Washington 25, D. C., at $2.00 per copy. The final report in this series investigates practical problems of the application of odor-suppressing agents in habitable spaces, with particular attention to the possibilities and limitations of ozone as a cancelling agent.

## Atlantic States Marine Fisheries Commission

THIRTEENTH ANNUAL MEETING: The Atlantic States Marine Fisheries Commission, at its 13th Annual Meeting in Baltimore, Md., October 4-6, unanimously adopted a resolution expressing officially its conviction that foreign shellfish which does not meet the sanitary standards required of domestic oyster and clam producers should be kept out of the country. The resolution does not affect Canada because that nation already has a working agreement with the United States on shellfish sanitation and requires its producers to meet the same high standards required of shellfish producers in the United States. Adoption of the resolution came after commissioners from shellfish-producing states had expressed the fear that importation of uncertified shellfish might result in harm to the consuming public which in turn might not differentiate between certified and uncertified shellfish products.




The Commission renewed its request for the rebuilding of the 70-year old laboratory of the Service at Woods Hole, Mass., badly damaged by four hurricanes two of which last month carried away the docks. This modernization, said the Commission, is urgently needed for important research for the states of the North Atlantic and Middle Atlantic Sections and the International Commission on the Northwest Atlantic Fisheries, and for the convenience of the 65,000 persons who annually visit its aquarium.

The Commission urged the Service to initiate biological studies of scallops, whiting, and menhaden and to investigate the causes of recent oyster mortality. It also asked for studies on the economics of the sea scallop industry; effects of dragging on the bottom; extension of the present technological program in New England waters dealing with exploratory fishing and freezing whole fish at sea.

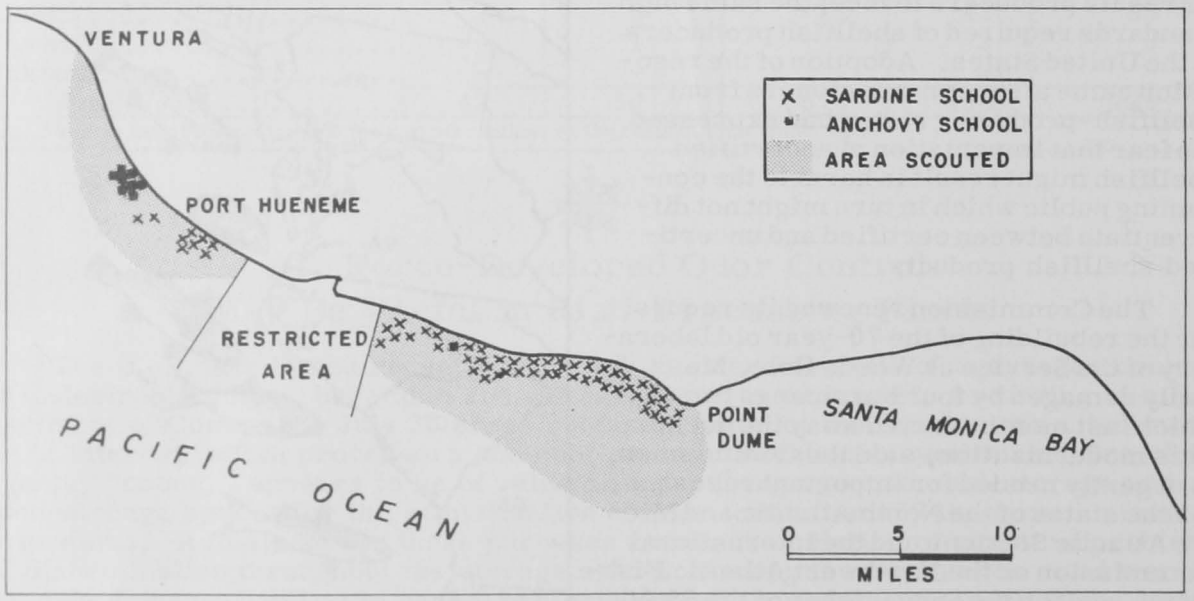
The Commission endorsed a Middle Atlantic Section request that funds made available under the Saltonstall Act, from duties on imported fish products, should be made available under an equitable system of apportionment to competent state research agencies. The Middle Atlantic Section accepted in principle a proposal that state fishery agencies in New York, New Jersey, and Pennsylvania be authorized to cooperate with each other and to adopt flexible regulations covering all species of fish that go up the Delaware River to spawn.

The Commission adopted a resolution recommended by the Chesapeake Bay Section opposing a reported plan to dump anthracite coal mine waste or any other industrial wastes into the Chesapeake Bay or any of its tributaries.

At the request of the South Atlantic Section the Commission endorsed a request to the Fish and Wildlife Service to extend the shad program which in its first six years has contributed much valuable data, and to enlarge and carry on the economic and marketing study of shrimp just begun by the Service.

## California

AIRPLANE USED TO SPOT FISH SCHOOLS (Airplane Spotting Flight 54-1): In order to determine the number and kinds of fish schools in the inshore area off Southern California, the Department of Fish and Game employed a commercial fish spotter V-O for a two-hour flight on August 17. The plane covered the area between Ventura and Pt. Dume from 12:30 to 2:40 p.m. and also observed commercial fishing activity in the area.




Airplane Scouting 54-1, flight of the V-O, Aug. 17, 1954.

A total of 120 schools of sardines and 15 schools of anchovies were tallied. The sardine schools as estimated by the commercial piolt ranged from about 10-30 tons with an average of about 15 tons per school. The anchovy schools were of much less uniform size ranging from about 5-80 tons per school. No other species of fish were observed in the area.

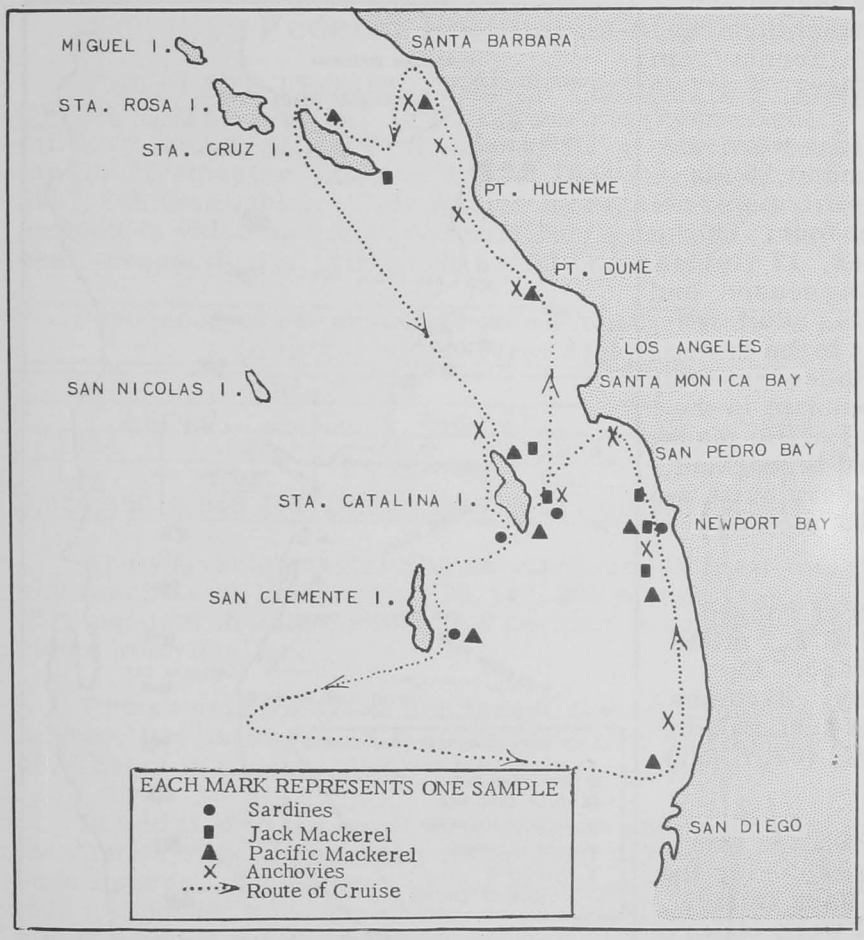
Three porter seine boats were observed setting on anchovies while being directed by the spotter from the air. A total catch of about 60 tons was made that day.

Notes were made on schooling behavior and color of the sardines and anchovies.

A large herd of California sea lions was observed swimming through the area of sardine concentration, but the sea lions seemed uninterested in the fish as they passed near them. It was estimated that about 90-100 sea lions were in the herd. They were swimming up and parallel to the coast.

* * * * *

CENSUS OF FISH POPULATIONS AND SEA SCANAR TESTS CONTINUED BY "YELLOWFIN" (Cruise 54-Y-7): The census of the populations of Pacific sardines, anchovies, jack mackerel, and Pacific mackerel off the coast of Southern California was continued by the California Department of Fish and Game's research vessel Yellowfin on a 10-day cruise completed at Los Angeles on August 9. The vessel also tested the recently-installed sea scanar.




Cruise 54-Y-7 of the M/V Yellowfin, July 30-Aug. 9, 1954.

A total of 29 light stations were occupied, 4 of which yielded samples of sardines, 6 jack mackerel, 8 Pacific mackerel, and 7 anchovies. In addition to the samples collected, Pacific mackerel were observed but were not sampled at 4 stations, anchovies at 2, and an unidentified school at 1. Fish schools seemed more numerous in this area than for the past two years. Two large Pacific mackerel schools (about 50-100 tons) were observed off the SE. end of Santa Cruz Island. Small schools of Pacific mackerel, from a few tons to a few fish, were observed throughout the area surveyed. Several schools of large fish (presumably bluefin tuna) were seen at the east end of Catalina, and midway between San Clemente Island and Tanner Bank. Several small spots of sardines were observed; however, only 3 large sardine schools (up to 50 tons) were seen. There were many anchovy schools observed throughout the area. Small jack mackerel resulting from this year's spawning were found over the area from La Jolla to San Pedro.

Sauries were seen over most of the area covered; however, they were scattered and not schooled densely in any area. Small squid were collected along the coast, and flying fish were in evidence during the entire cruise. Grunion and top smelt were collected quite frequently along the mainland; many grunion were in a spawning condition.

The sea scanar proved a definite aid in locating fish schools. Many schools were located by the scanar which were not seen visually. Many schools that were seen visually were picked up by the scanar first. Schools of fish showed up well with good definition at ranges less than 400 feet. Very large schools showed good definition out to about 600 feet. Beyond 800 feet no fish school was located during the cruise.

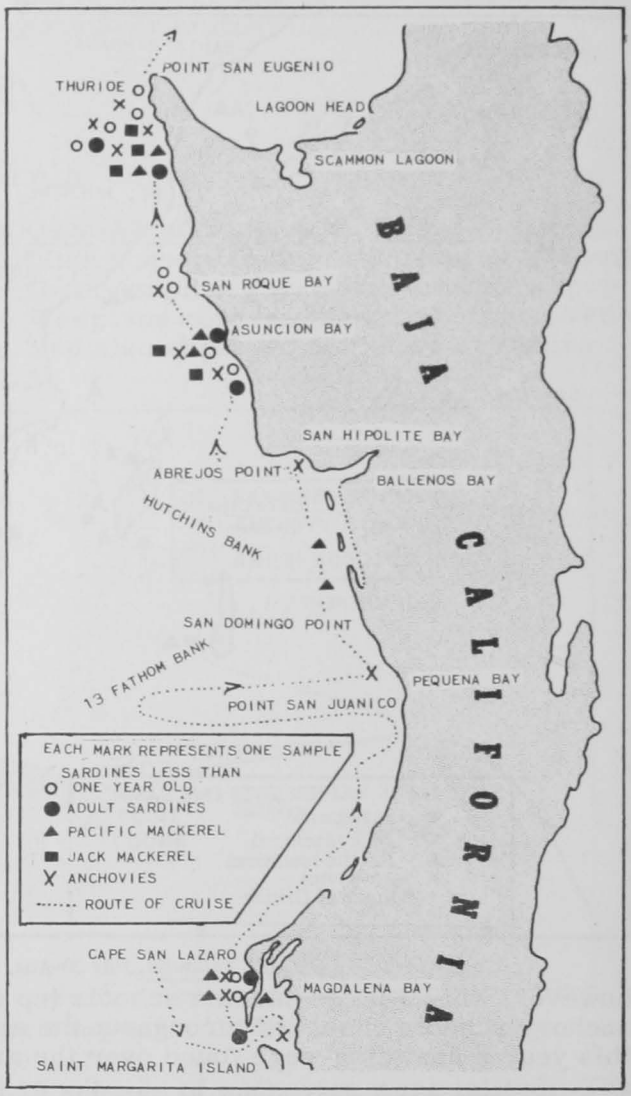
* * * * *

SARDINE ABUNDANCE OFF LOWER CALIFORNIA SAMPLED BY "YELLOWFIN" (Cruise 54-Y-8): The first of four cruises for 1954, designed to assess the abundance of sardines resulting from 1954 spawning, was completed by the California Department of Fish and Game's research vessel Yellowfin on September 2. The cruise, which started on August 16, was also designed to assess the relative abundance of older sardines, jack mackerel, Pacific mackerel, and anchovies. Also, a total of 326 yellowtail were tagged and released. The cruise included the area along the coast of Lower California from Pt. Eugenia to Magdalena Bay.

A total of 44 light stations were occupied. Sardines were found at 15 stations, anchovies at 13, Pacific mackerel at 11, and jack mackerel at four. Of the 15 stations yielding sardines, 12 yielded sardines of the 1954 spawning season, and 5 yielded adults. In general, adult sardines were not very abundant in the entire area surveyed; juvenile sardines less than one year old were more abundant in the vicinity of Turtle Bay; and Pacific mackerel and anchovies appeared throughout the area. Thread herring were quite abundant between Pt. San Juanico and Magdalena Bay.

Sea surface temperatures ranged from 17.05° C. (62.7° F.) at 2.1 miles SSE. of Pt. Rompiente to 25.65° C. (78.2° F.) in Magdalena Bay. Sardines were sampled from water of surface temperatures between 17.05° C. (62.7° F.) and 24.10° C. (75.4° F.).

Yellowtail caught on hook and line were tagged at various places during the cruise. At the 13 Fathom Bank (inside Uncle Sam Bank) yellowtail were observed swimming under the light. Chumming with condemned canned fish so excited the yellowtail that they were easily captured with the blanket net. Two successive sets yielded 26 and 60 yellowtail which were subsequently tagged and released.



Cruise 54-Y-8 of the M/V Yellowfin, Aug. 16-Sept. 2, 1954.

## Cans--Shipments for Fishery Products, January-July 1954

Total shipments of metal cans for fish and sea food during January-May 1954 amounted to 59,566 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 61,818 short tons for the same period last year. Smaller packs of Maine sardines and a leveling off of tuna canning were reponsible for this year's drop in metal can shipments.

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

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF DEFENSE, AUGUST 1954: Fresh and frozen fishery products purchased for the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force by the Army Quartermaster Corps in August 1954 amounted to 2,234,850 pounds, valued at $977,846 (see table). This was an increase of 19.5 percent in quantity and 47.7 percent in value as compared with July purchases, but lower by 26.7 and 31.4 percent, respectively, than August 1953 purchases.

Purchases of Fresh and Frozen Fishery Products by Department of Defense
(August and the First Eight Months of 1954 and 1953)

| QUANTITY | | | | VALUE | | | |
|---|---|---|---|---|---|---|---|
| August | | Jan.-Aug. | | August | | Jan.-Aug. | |
| 1954 | 1953 | 1954 | 1953 | 1954 | 1953 | 1954 | 1953 |
| Lbs. | Lbs. | Lbs. | Lbs. | $ | $ | $ | $ |
| 2,234,850 | 3,048,474 | 16,142,289 | 19,114,012 | 977,846 | 1,425,408 | 6,728,060 | 8,269,660 |

Army Quartermaster Corps purchases of fresh and frozen fish during the first eight months in 1954 totaled 16,142,289 pounds (valued at $6,728,060), lower by 15.5 percent in volume and 18.6 percent in value as compared with the similar period a year earlier.

Prices paid for fresh and frozen fishery products by Department of the Army in August 1954 averaged 43.8 cents per pound as compared with 35.4 cents in July and 46.8 cents in August 1953.

In addition to the purchases of fresh and frozen fishery products indicated above, the Armed Forces generally make local purchases which are not included in the above figures. Therefore, actual purchases are somewhat higher than indicated, but it is not possible to obtain data on the local purchases made by military establishments throughout the country.

## Fillet and Fish Stick Promotion in Columbus, Ohio

From September 20 through November 20, Columbus, Ohio, was scheduled to be the scene of a concentrated fish fillet and fish stick sales promotion campaign. The national fisheries trade association and the many producers of frozen fillets and fish sticks were cooperating in this joint product promotional campaign in that city, which is famous as an introductory spot for food promotion campaigns.

In cooperation with the industry, the U. S. Fish and Wildlife Service arranged for fish cookery demonstrations for institutional food groups in the greater Columbus area: Columbus city schools; Columbus Diocese parochial schools; Franklin County schools; Central Ohio public schools; Port Columbus Naval Air Station; Ohio Department of Mental Hygiene and Correction; State prison and State hospitals. Other organizations cooperating in the promotion programs are the Columbus City Health Department; Ohio Fuel Gas Company; Columbus and Southern Electric Company; Central Ohio Western Association; and the radio, TV, and newspapers of Columbus.

The importance of this fishery products promotion campaign assumes unusual importance during this period, inasmuch as the livestock and vegetable interests were scheduled to conduct simultaneously a national program to promote the sales of their products. Through the media of radio, TV, newspaper, and public contacts, the National Fisheries Institute, the fishery industry, and the Fish and Wildlife Service hope to impress upon the consumers of the greater Columbus area the importance of fishery products in their every day diet.

With increased competition for the consumer's attention, promotion programs of this nature become increasingly important. Producers throughout the country should direct their attention to the activities in Columbus during this period and should observe closely the results, for application to the sales of their own products.

## Fur-Seal Skin Prices Decline at Fall Auction

A decline in prices characterized the semiannual auction of Government-owned fur-seal skins at St. Louis on October 18, Secretary of the Interior McKay announced October 19. A total of 26,590 skins, products of the sealing industry administered by the Department of the Interior's Fish and Wildlife Service on the Pribilof Islands of Alaska, brought $2,045,326. This compares with 25,038 skins sold for $2,301,646 at the April sale.

The average price for all skins sold for the account of the United States Government was $76.92, representing a 13.6-percent decline from the average for the spring auction.

Of the Alaska skins, 14,790 were dyed "Matara" (brown), 1,743 were "Safari" brown (a lighter brown), and 10,057 were blacks. The Matara skins brought an average of $73.49, an 11.7-percent drop from the April auction. The Safari skins sold for an average of $52.97, 9.2 percent lower. The black skins averaged $86.12, 16 percent less than in April. Because sizes and qualities of skins differ somewhat from one auction to another, the comparisons must be considered relative.

A total of 920 Matara-processed skins, representing part of the United States share of skins taken off the Japanese coast in 1952 as part of an international research program, averaged $24.31, for a total of $22,362.50.

In addition to the United States-owned skins, 5,442 Cape of Good Hope fur-seal skins were sold for the account of the Government of the Union of South Africa at an average of $26.64, a decline of 16.5 percent, and 800 Uruguay fur-seal skins were sold for the Uruguayan Government at a $27.84 average.

The next sale is scheduled for April 4, 1955.

## Great Lakes Fishery Investigations

MANY LAMPREYS CAUGHT IN CONTROL STRUCTURES: Seven control structures maintained by the Great Lakes Fishery Investigations staff of the U. S. Fish and Wildlife Service on tributaries of northern Lake Michigan between March 19 and May 24, 1954, took 5,828 lampreys.

SEA LAMPREY
(PETROMYZON MARINUS)

MOUTH OF SEA LAMPREY

During the same period, 44 structures located on Lake Superior streams caught 1,949 lampreys. The take of lampreys in Lake Superior streams east of Marquette was generally larger than in the 1953 season. To the west of Marquette, only 6 of 28 streams yielded any sea lampreys, a circumstance suggesting that this parasite may not yet be firmly established in the central and western areas of the Lake.

* * * * *

EXPERIMENTAL GILL-NETTING AND TRAWLING IN SOUTHERN LAKE MICHIGAN ("CISCO" Cruise VI): Twice during Cruise VI of the Great Lakes Fishery Investigations vessel Cisco experimental gill nets were set at two different depths (25 and 50 fathoms) off Grand Haven. Trawling was done off Grand Haven and in the areas between Milwaukee and Port Washington, between Port Washington and Sheboygan, and between Sheboygan and Manitowoc. The vessel was on this cruise from August 17 through August 29. A fishery and limnological survey of southern Lake Michigan was the principal purpose of the cruise.

The "bloater" continues to be the most abundant species of chubs in catches of both trawls and gill nets. All species of chubs are more abundant in gill nets than they were earlier this year. This is particularly true of nets set at 50 fathoms. Nylon nets continue to take several times more chubs than similar linen nets.

An interesting midwater distribution of chubs was discovered during the intensive study. Chubs were taken at night between 5 and 15 fathoms over a 40-fathom bottom. At the same time there was a heavy concentration of Mysis relicta between 5 and 10 fathoms. Fathogram traces showed a "scattering layer" between 5 and 10 fathoms during the period that chubs were taken in this depth range.

Hydrographic transects were made across Lake Michigan from Grand Haven to Milwaukee, and from Manitowoc to Ludington. Three hydrographic stations were made along each transect. Five hundred and eighty drift cards were distributed along the transects. Ten cards packaged in plastic envelopes and ten in sealed glass bottles with drag attachments were dropped at 5-mile intervals. A 13-hour intensive limnological and fishing study was made off Grand Haven.

Drift bottles released between Grand Haven and Milwaukee on July 9 during Cruise IV have been recovered over a sufficient length of time to show the pattern and direction of drift. Most of the bottles released 3 miles west of Grand Haven moved northward and were recovered along the east shore near Muskegon. One of these, however, was recovered at Chicago. Bottles released further west of Grand Haven (5 to 35 miles out in the lake) moved shoreward in the area south of Grand Haven and have been recovered all along the southeast and south shore to the Chicago area. The sequence of returns along the shore indicates the presence of a southeasterly current that moves in from the center of the lake off Grand Haven and then moves in a clockwise direction along shore. No recoveries have been made of bottles released from the center of the lake to a point about 27 miles east of Milwaukee. Drift bottles released from 3 to 27 miles off Milwaukee were recovered along the shore north of Milwaukee to Sheboygan, indicating the presence of a current moving northward in this area. Drift cards enclosed in plastic envelopes and plastic tubes were released during Cruise IV along with the bottles to determine the relative efficiency of the three methods. Cards in plastic envelopes were recovered in a pattern similar to that of the bottles but somewhat more irregular, possibly because of increased influence of winds as the card floats in the surface film and has no contact with deeper currents. The plastic tubes had drags suspended from them as did the bottles and were recovered in a pattern very similar to that of bottle recoveries.

* * * * *

GILL-NETTING AND TRAWLING TESTS CONTINUED BY "CISCO" (Cruise VII): Experimental gill-netting and trawling in southern Lake Michigan were continued by the Cisco on Cruise VII. Gill nets were set in two depths off Grand Haven, two depths off Racine, and in midlake between Racine and Holland in 86 fathoms. An oblique set of gill nets was made off of Grand Haven. Trawling was carried on off South Haven and in the area between Milwaukee and Racine. Almost continuous high winds prevented any work on the lake on three days, and work was impaired by high seas during all but one of the remaining days of the cruise. Trawling activity was greatly reduced and a scheduled intensive limnological study was cancelled. The Cisco departed Grand Haven on September 7 and returned to that port on September 19.

Surface temperatures over Lake Michigan are falling steadily. They were extremely constant across the Lake, ranging mostly between 66° and 69° F., except for a narrow, somewhat cooler area near the east shore.

Chub (Leucichthys kiyi) made up nearly three-quarters of the midlake gill-net set, but they did not appear to be nearly so abundant in this area as they were in early summer. These nets also yielded two of another species of chub (L. nigripennis) the first of the year. The second lake trout of the year was taken in gill nets set off Racine. This trout weighted $2\frac{1}{2}$ pounds and had one healed lamprey scar and 3 fresh scars--one of them leaving part of the intestines exposed.

Hydrographic transects were made across Lake Michigan from Grand Haven to Milwaukee; from Racine to Holland, Michigan; and from South Haven to Waukegan, Illinois. Eight hydrographic stations were visited along the transects. A total of 740 drift cards were distributed along the Grand Haven-Milwaukee and South Haven-Waukegan transects. Procedure was the same as during Cruises V and VI--10 cards

packaged in plastic envelopes and 10 in sealed glass bottles with drag attachments dropped at 5-mile intervals.

During the period May-September, the conductivity (a rough measure of nutrient minerals) of surface water has been higher in shore waters than in midlake, probably because of the high conductivity of river water entering the lake along shore. In May, winds distributed some of the warmer less dense river water over the surface of the lake. Conductivity appeared to decrease with depth of water although differences were not great. As summer progressed the conductivity of the deeper water has steadily increased and the difference between surface and deep water has become well defined thus reversing the pattern that existed in May. The change of conductivity with depth during the summer is probably the result of use of mineral nutrients from the surface water by plankton organisms, the subsequent settling of these organisms and the release of the contained electrolytes upon death, and decomposition of the plankton at greater depths.

A special effort was made during this cruise to obtain an explanation for the much poorer return of drift cards enclosed in plastic envelopes and tubes than for cards contained in glass bottles. Observations of material washed up along five miles of shore revealed several possibilities. Due to their color and form the cards in plastic envelopes and tubes blend in well with other flotsam found in windrows along the beach. Cards in plastic envelopes could be more easily buried in this material than plastic tubes or glass bottles. Plastic envelopes can also be blown far back from the beach by strong winds and can be covered by blown sand much more easily than tubes and bottles, with the bottles being least likely to be covered. If all these containers were displayed on open sand the glass bottle would be most easily seen. Of the three containers, regardless of how they appeared on the beach, the glass bottle would be the most likely container to be picked up and examined not only because the card rolled up within the bottle is more conspicuous than cards enclosed in envelopes and tubes, but also because glass bottles are choice items for rifle practice as evidenced by the greater number of broken than whole bottles found along the beach and the ever-present empty cartridge boxes.

## Gulf of Mexico

FIRST COMMERCIAL TUNA CATCH LANDED: The first commercial catch of tuna in the Gulf of Mexico was landed at Pascagoula, Miss., early in October, Secretary of the Interior Douglas McKay announced October 19.

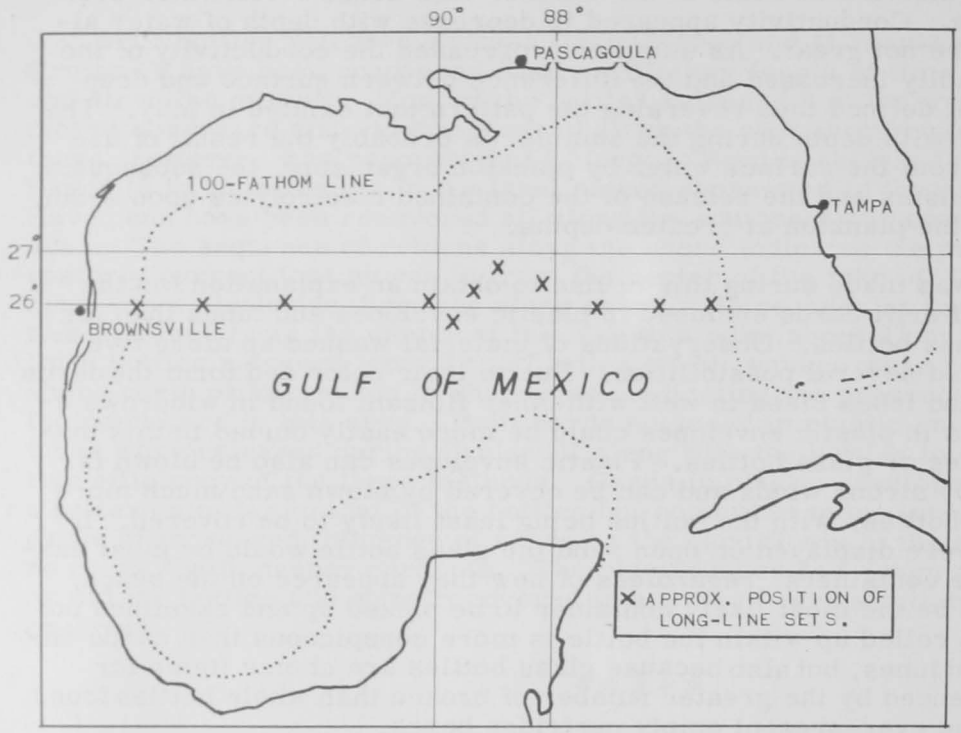
The fishing vessel Santa Antonino made port with $12\frac{1}{2}$ tons of prime yellowfin tuna taken in the central Gulf region. The fish weighed about 100 pounds each.

Last spring U. S. Fish and Wildlife Service specialists aboard the exploratory fishing vessel Oregon discovered that yellowfin tuna were widely distributed in the Gulf and could be taken at subsurface levels with modified Japanese-style long-line gear. Four successful tuna trips have been made to various parts of the Gulf and the Oregon found that the central Gulf's northbound current, between 88° and 90° west longitude, affords the best yellowfin fishing at the present time. Making use of this information, the Santa Antonino proceeded to this area and reported catches as high as 9 tuna per 100 hooks, a very good showing for this type of fishing.

Another commercial vessel, a converted red-snapper schooner operating out of Pensacola, Fla., also has begun tuna fishing in the Gulf. Commercial interests in Mississippi are now reported to be outfitting a long-line vessel, scheduled to begin tuna operations soon.

## Gulf Exploratory Fishery Program

"OREGON" CATCHES 102 LARGE YELLOWFIN TUNA (Cruise 26): A total of 102 large yellowfin tuna were caught by the Service's exploratory fishing vessel Oregon on an 18-day exploratory tuna long-lining trip in the central Gulf of Mexico, completed at Pascagoula, Mississippi, on October 6. Fifteen of the fish were mutilated by sharks and the remaining (87) whole yellowfin tuna weighed 10,376 pounds. Also, 6 blackfin tuna, 15 white marlin, 3 blue marlin, 3 sailfish, 1 white skipjack, and 25 sharks were caught on the long lines. Two blackfin tuna and one $3\frac{1}{2}$-pound yellowfin tuna were caught on trolling lines.




This chart shows distribution of exploratory fishing by the Service's vessel Oregon on Cruise 26.

A total of 11 long-line sets were made (4,600 hooks per set) along the 26th parallel from the edge of the Florida continental shelf to the Texas continental shelf (fig. 1). Ten sets, made over depths exceeding 1,000 fathoms, produced all the yellowfin tuna--four of these in the central Gulf northbound current (between 88° W. and 90° W.) accounted for 72 fish. The other six sets, made east and west of this current, produced the remaining 30.

Hurricane "Gilda" caused the Oregon to enter the port of Brownsville, Texas, two days ahead of schedule. Strong winds and high seas hampered operations on the return trip. One set made on top of the Texas shelf at the request of Texas fishing interests produced 2 blackfin tuna and 4 white marlin, but no yellowfin tuna. However, two additional long-line sets were made in heavy seas farther east in deeper water and both produced large yellowfin tuna.

As secondary objectives to this cruise, the Oregon experimented with five different materials for main lines. At the start of the trip the crew, using a 180-fathom beach seine, was successful in obtaining satisfactory amounts of suitable bait in six hours of fishing.

Scooping under night lights for young tuna was carried out whenever the vessel was drifting.

## Louisiana

COMMERCIAL FISHERIES PRODUCTION: Shrimp Fishery: The 1953 production of shrimp (heads on) by Louisiana fishermen and the shrimp taken in Louisiana waters and processed in Mississippi amounted to 437,340 barrels (91.8 million pounds). This was an increase of 10 percent over the production of 398,953 barrels (83.8 million pounds) in 1952, and 12 percent greater than the 1946-52 annual average production of 391,517 barrels (82.2 million pounds).

Table 1 shows the shrimp production (heads-on) and the type of processing by areas. Shrimp taken in Louisiana, principally Orleans, St. Bernard, and Plaquemines parishes, for processing in Mississippi plants was utilized principally for

Table 1 - Louisiana Shrimp Production by Area and Type of Processing, 1952-53

| Area of Production | Amount Utilized for: | | | | | Total |
|---|---|---|---|---|---|---|
| | Whole | Headless | Canned | Dried | Cooked & Peeled | |
| | (Barrels, Heads on) | | | | | |
| | 1953 | | | | | |
| La. Shrimp Processed in Mississippi | - | 3,872 | 21,814 | - | - | 25,686 |
| French Market | 46,127 | 95 | - | - | - | 46,222 |
| New Orleans Area, St. Bernard, and Plaquemines Parish | 308 | 25,275 | 20,805 | 164 | - | 46,552 |
| Lafourche Parish | 1,147 | 65,436 | 3,597 | - | 96 | 70,276 |
| Terrebonne Parish | 756 | 47,038 | 28,797 | 22,045 | 15,877 | 114,513 |
| Jefferson Parish | 2,324 | 52,322 | 16,269 | 4,698 | 80 | 75,693 |
| St. Mary and all other Parishes to Texas Line | - | 56,296 | 264 | 112 | 1,726 | 58,398 |
| Total 1953 | 50,662 | 250,334 | 91,546 | 27,019 | 17,779 | 437,340 |
| | 1952 | | | | | |
| La. Shrimp Processed in Mississippi | - | 12,168 | 20,303 | - | - | 32,471 |
| French Market | 35,259 | - | - | - | - | 35,259 |
| New Orleans Area, St. Bernard, and Plaquemines Parish | - | 12,876 | 18,102 | 107 | - | 31,085 |
| Lafourche Parish | 74 | 48,371 | 925 | 800 | 206 | 50,376 |
| Terrebonne Parish | 651 | 54,382 | 37,446 | 31,409 | 18,292 | 142,180 |
| Jefferson Parish | 483 | 23,322 | 16,480 | 3,694 | 172 | 44,151 |
| St. Mary and all other Parishes to Texas Line | 202 | 60,216 | 1,674 | 58 | 1,281 | 63,431 |
| Total 1952 | 36,669 | 211,335 | 94,930 | 36,068 | 19,951 | 398,953 |

Note: To convert to pounds heads-on basis multiply barrels by 210 pounds. To convert to pounds heads-off basis multiply barrels by 125 pounds.

canning. The French Market area where shrimp is sold heads on for bait and home consumption drew its supplies principally from Orleans, St. Bernard, Plaquemines, and Jefferson parishes. The New Orleans, St. Bernard, and Plaquemines area shrimp taken in these parishes and processed in plants in and around New Orleans was utilized principally for canning and fresh and frozen headless. The Jefferson parish area shrimp produced and processed in that area was utilized principally for fresh and frozen headless but substantial quantities were also canned, dried, and marketed cooked and peeled. The shrimp from the other three areas (Lafourche, Terrebonne, and St. Mary parish to the Texas line) was taken and processed in those parishes and utilized principally as fresh and frozen headless. Wherever a plant processed shrimp taken in parishes other than the one in which it was located, credit for production of such shrimp was given to the parish in which the shrimp was taken.

The dried shrimp industry in Louisiana for many years utilized the major portion of the shrimp production. Over 100,000 barrels of shrimp used to be utilized for drying, but dried shrimp production has decreased. The lowest production in the history of Louisiana was reported in 1953 when only 27,020 barrels of shrimp were dried. Because of the increased demand for frozen shrimp and the drop in the demand for dried shrimp, more of the catch is being utilized as fresh and frozen headless shrimp.

In 1953 a total of 473 tons of shrimp meal were produced in Louisiana with a value at the manufacturers' level of $40,205.

Oyster Fishery: During the calendar year of 1953, a total of 793,074 barrels of oysters (equivalent to 3,172,296 pounds of meats) were taken from Louisiana waters, while in 1952 the take was 885,716 barrels (3,542,864 pounds of meats).

Menhaden Fishery: The menhaden catch in Louisiana waters in 1953 totaled 610 million pounds, valued at $6.5 million ex-vessel. In 1952 the catch was somewhat higher, 702 million pounds, but in 1951 the catch was only 401 million pounds. Of the 1953 catch, 460 million pounds were processed in Louisiana plants, 75 million pounds in Texas plants, and 75 million pounds in Mississippi plants.

Other Fisheries, 1952/53: The catch of the minor salt- and fresh-water fish and shellfish (excluding the salt-water shrimp, oyster, and menhaden) in Louisiana by commercial fishermen during 1952/53 (July-June) amounted to 23,825,611 pounds, valued at $4,136,053 ex-vessel, according to the Fifth Biennial Report of the Louisiana Wild Life and Fisheries Commission 1952-1953 (see table 2). This is an in-

Table 2 - Louisiana's Commercial Fish and Shellfish Production (Excluding Shrimp, Oysters, and Menhaden), 1952/53 and 1951/52 1/

| Species | 1952/53 | | 1951/52 | |
|---|---|---|---|---|
| | Quantity | Value | Quantity | Value |
| Salt-Water Fisheries: | Lbs. | $ | Lbs. | $ |
| Drum, black | 252,710 | 15,163 | 228,734 | 11,437 |
| Flounders | 200,668 | 50,167 | 76,546 | 19,137 |
| Mullet | 467,754 | 32,743 | 744,766 | 44,686 |
| Redfish (red drum) | 291,539 | 72,885 | 167,851 | 41,963 |
| Red snapper | 66,645 | 16,661 | 35,164 | 7,736 |
| Sheepshead | 62,152 | 4,351 | 66,272 | 4,639 |
| Sea trout, spotted | 436,867 | 131,060 | 427,170 | 128,151 |
| Other fish | 393,283 | 43,261 | 175,916 | 17,592 |
| Crabs, hard | 8,190,800 | 491,447 | 5,503,625 | 275,181 |
| Crabs, soft | 277,347 | 88,751 | 125,807 | 37,742 |
| Crab meat | 354,215 | 318,794 | 19,997 | 15,997 |
| Sea turtles | 19,486 | 1,169 | 28,241 | 1,694 |
| Total Salt-Water | 11,013,466 | 1,266,452 | 7,600,089 | 606,955 |

| Species | 1952/53 | | 1951/52 | |
|---|---|---|---|---|
| | Quantity | Value | Quantity | Value |
| Fresh-Water Fisheries: | Lbs. | $ | Lbs. | $ |
| Buffalofish | 2,866,589 | 458,654 | 3,502,533 | 560,405 |
| Catfish | 5,631,318 | 1,633,054 | 7,549,866 | 2,113,962 |
| Garfish | 534,575 | 32,075 | 683,294 | 34,165 |
| Gaspergou (sheepshead) | 1,316,616 | 197,492 | 2,432,422 | 340,539 |
| Spoonbill catfish | 469,325 | 70,399 | 231,183 | 27,742 |
| Miscellaneous | 176,978 | 17,698 | 245,396 | 24,540 |
| Crayfish (crawfish) | 1,489,821 | 372,455 | 174,776 | 43,694 |
| Frogs | 126,852 | 57,083 | 33,057 | 13,223 |
| Shrimp, river | 34,946 | 17,473 | 35,950 | 17,975 |
| Turtles | 165,225 | 13,218 | 67,515 | 4,051 |
| Total Fresh-Water | 12,812,145 | 2,869,601 | 14,955,992 | 3,180,296 |
| Grand Total | 23,825,611 | 4,136,053 | 22,556,081 | 3,786,251 |
| | Pieces | $ | Pieces | $ |
| Baby green turtles | 1,760,229 | 146,627 | 812,992 | 67,722 |

1/ July 1-June 30.

crease of 6 percent in volume and 9 percent in value as compared with the 1951/52 production of 22,556,081 pounds, valued at $3,786,251, due mainly to the large increase in the catch of hard-shell crabs. (The figures do not include a small production of baby green turtles.)

The catch in Louisiana's salt-water fisheries--exclusive of shrimp, oysters, and menhaden--in 1952/53 amounted to 11,013,466 pounds, valued at $1,266,452; up 45 percent in volume and 109 percent in value as compared with the 1951/52 production of 7,600,089 pounds, valued at $606,955. In both seasons hard-shell crabs were by far the leading item landed in the minor fisheries, comprising 74 percent of the total in 1952/53 and 72 percent in 1951/52. Of the finfish varieties, mullet, speckled sea trout, redfish or red drum, in that order, were the leading items caught in 1952/53.

Louisiana's fresh-water fisheries yielded a total of 12,812,145 pounds, valued at $2,869,601, in the 1952/53 season, a drop of 14 and 10 percent, respectively, compared with the 1951/52 production of 14,955,992 pounds, valued at $3,180,296. There were lighter catches of all the leading varieties, with the exception of the crawfish catch which increased considerably. In the 1952/53 season catfish comprised 44 percent of the total catch of the fresh-water fisheries, buffalofish 22 per-

cent, crawfish 12 percent, and gaspergou or sheepshead 10 percent. Catfish was also the leading item in 1951/52, making up 50 percent of the total, followed by buffalofish 23 percent, and gaspergou or sheepshead 16 percent.

## Massachusetts

GLOUCESTER MENHADEN LANDINGS GREATEST IN RECENT YEARS: The 1954 menhaden season at Gloucester was the most successful since the return of this species to New England waters a few years ago, the Service's representative at Gloucester reports. Menhaden landings at Gloucester in 1954 totaled 35.4 million pounds as compared with 20.0 million pounds in 1953 and 25.8 million pounds in 1952. During the 1954 season the ex-vessel price ranged from $1.15-1.40 per hundredweight.

Although landings of fish not for human consumption began to increase in September, the price rose from $17.50 to $20.00 per ton ex-vessel.

However, most processing firms prefer menhaden to the so-called "trash" species because the menhaden are cleaner and are more uniform in size. The "trash" species vary from the huge monkfish and skates down to small whiting and hake.

## Michigan's Great Lakes Commercial Fish Production, 1953

Commercial fishermen landed a total of 25 million pounds of fresh-water fish from the Great Lakes at Michigan ports during 1953 (see table), reports the Michi-

Michigan's Great Lakes Commercial Fish Production, 1953 by Lakes

| Species | Quantity | | | | | Landed Value |
|---|---|---|---|---|---|---|
| | Lake Michgan | Lake Superior | Lake Huron | Lake Erie | Total | |
| | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. | $ |
| Lake herring | 3,045,656 | 2,415,391 | 1,427,747 | - | 6,888,794 | 439,469 |
| Smelt | 4,164,506 | 130 | 210,681 | - | 4,375,317 | 166,684 |
| Chubs | 3,545,507 | 25,435 | 105,969 | - | 3,676,911 | 647,033 |
| Carp | 19,069 | 11 | 1,360,781 | 1,183,209 | 2,563,070 | 108,121 |
| Lake trout | 286 | 1,746,158 | - | - | 1,746,444 | 698,600 |
| White and redhorse suckers | 432,730 | 23,438 | 1,134,212 | 22,417 | 1,612,797 | 100,608 |
| Lake whitefish | 857,905 | 430,490 | 153,069 | - | 1,441,464 | 664,183 |
| Yellow perch | 636,054 | 193 | 458,484 | 65,397 | 1,160,128 | 174,030 |
| Yellow pike | 286,740 | 284 | 177,145 | 383,451 | 847,620 | 191,368 |
| Catfish | 1,156 | - | 333,103 | 19,194 | 353,453 | 82,169 |
| Bullheads | 10,253 | - | 28,658 | 39,507 | 78,418 | 8,574 |
| Northern pike | 31,760 | 180 | 36,779 | 7,826 | 76,545 | 11,239 |
| White bass | - | - | 3,692 | 41,513 | 45,205 | 4,948 |
| Sheepshead | 8,783 | - | 6,874 | 19,316 | 34,973 | 1,225 |
| Rock bass | 1,763 | 14 | 21,039 | 7,421 | 30,237 | 4,158 |
| Menominees | 7,518 | 4,565 | 11,264 | - | 23,347 | 4,539 |
| Longnose suckers | 13,260 | 139 | 9,602 | - | 23,001 | 1,408 |
| Bowfin | 4 | - | 15,617 | 6,603 | 22,224 | 891 |
| Sturgeon | 5,154 | 166 | 1,488 | - | 6,808 | 4,781 |
| Sauger | 60 | 68 | 906 | 4,262 | 5,296 | 639 |
| Burbot | 151 | 116 | 364 | 35 | 666 | 28 |
| Gizzard shad | - | - | 71 | - | 71 | 1 |
| Total Quantity | 13,068,315 | 4,646,778 | 5,497,545 | 1,800,151 | 25,012,789 | - |
| Total Landed Value | $1,558,264 | $1,039,388 | $590,428 | $126,616 | - | $3,314,696 |

gan Department of Conservation. The total landed value amounted to $3.3 million. In 1952 the total production was over 29 million pounds.

Lake Michigan was the leading production area and accounted for 52 percent of the total catch, followed by Lake Huron with 22 percent, Lake Superior 19 percent, and Lake Erie 7 percent.

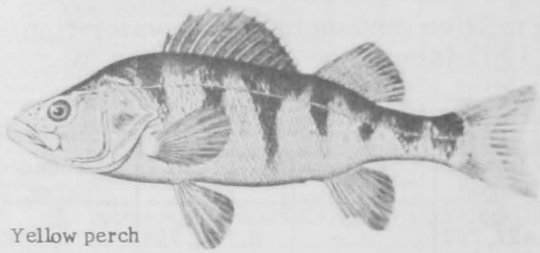
Lake herring was the leading species in volume caught by Michigan commercial fishermen in the Great Lakes in 1953 with a total of 6.9 million pounds, but 4.1 million pounds less than in 1952 when 11.0 million pounds were landed. Other species were landed in about the same volume as a year earlier with only slight increases and decreases in the individual items.

Winter gill-net fishing in Great Lakes.

Note: Also see Commercial Fisheries Review, June 1953, p. 23.

## Michigan

PERCH POPULATION INCREASES: A bounteous yellow perch population is reported this year by Michigan's Great Lakes commercial fishing fleet, according to a recent bulletin from the Michigan Department of Conservation.



Yellow perch

The huge crop has caused a drop in prices and fishermen are urging that now is the time to make use of one of nature's most productive moments. Many fishermen sell the fish retail in bulk or by the pound from docks at dozens of Great Lakes ports.

On Lake Michigan last year the greatest supplies of yellow perch came from Escanaba, Fayette, Garden, Muskegon, Saugatuck, and South Haven. On Lake Huron the ports of greatest supply were AuGres, Bay Port, Pinconning, Quanicassee, Sebewaing, and Standish.

## National Tuna Week

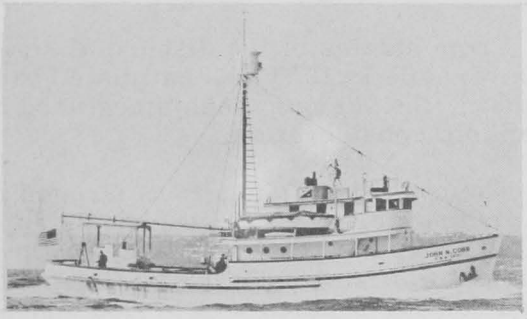
Over one-half billion cans of tuna (more than three cans per person) will be consumed in the United States in the next year, according to trade estimates. The recent trend in tuna production, with each year's pack exceeding that of the previous year and setting a new total pack record, seems due to be continued this year. Based on the latest available statistics, the 1954 pack up to October was developing at a slightly faster rate than in 1953 when the total U. S. supply (domestic pack plus imports) was approximately 12 million cases or about 600 million cans.

During National Tuna Week, November 4-13, member companies and the sponsoring Tuna Research Foundation conducted a special advertising campaign of product advertisements in nationally-distributed grocer and food merchandising journals, and in daily newspapers. Members of allied industries simultaneously released tie-in advertising. Point-of-sales material and recipe pads were made available by both of these groups to retail outlets throughout the United States.


In observance of National Tuna Week, the Fish and Wildlife Service released as its recipe of the month, Tuna Pie. This recipe was issued in an Interior Department press release which was sent to about 1,000 home economists, food editors, and restaurant and institutional dietitians throughout the United States who have requested this regular recipe Service. In additon, tuna will continue to be one of the basic fishery items featured in the Service's school-lunch and other institutional fish-cookery demonstrations.

## North Pacific Exploratory Fishery Program

GOOD COMMERCIAL FISHERY POTENTIAL IN PRINCE WILLIAM SOUND REPORTED BY "JOHN N. COBB" (Cruise 20): Favorable results were obtained by the Service's exploratory fishing vessel John N. Cobb on a three-months' cruise to investigate the commercial potentialities for bottom fish, shrimp, and king crab in the Prince William Sound area of Alaska. The vessel returned to Seattle, Wash., on September 16--actual fishing operations were carried on from July 13 to September 8.



The John N. Cobb, a vessel operated by the Service's Branch of Commercial Fisheries, is conducting exploratory fishing in the North Pacific.

Standard commercial otter-trawl nets were used in fishing operations for bottom fish, and a total of 88 drags was made with this gear. Fishing results revealed that commercial quantities of Pacific ocean perch were available in offshore waters adjacent to Prince William Sound. Catches of 1,100 to 6,000 pounds per hour of this species were made off Middleton Island at depths from 79 to 112 fathoms. In the area 12 to 24 miles south of Point Elrington at 90 to 122 fathoms, from 2,300 to 3,200 pounds of Pacific ocean perch and up to 1,000 pounds of sablefish were taken per one-hour drag. Drags inside the 50-fathom contour from near Cape Hinchinbrook to off the Copper River caught up to 1,800 pounds of starry flounder per hour. English sole were encountered frequently in this area, but 125 pounds per drag was the best catch. Otter-trawl drags were also made in various areas of Prince William Sound proper, but only small catches of various species of commercially desirable bottom fish were encountered. Small numbers (up to 14 per drag) of marketable-size king crab were frequently present in drags in this area. The largest king crab weighed 17 pounds.

Areas fished for shrimp included Orca Bay, Port Gravina, Port Fidalgo, Valdez Arm, Port Valdez, College Fiord, and Montague Strait. A 20-foot beam trawl was the principal gear used, although shrimp traps were also fished. A total of 90 beam-trawl drags was made and 69 individual shrimp traps were set. Favorable shrimp catches were made in Orca Bay with 5 of the best drags in this area (at 58 to 122 fathoms) averaging 212 pounds per hour, mostly pink shrimp of commercial size. In Port Gravina the best drag caught 310 pounds of commercial-size pink shrimp per hour. In the Montague Strait area 282 pounds of commercial-size pink shrimp per hour were taken off Graveyard Point. Only a few shrimp were taken by traps.

A total of 92 individual king crab pots was set in various areas of Prince William Sound. The best results were obtained in College Fiord where 9 pots at 43 to 68 fathoms for 23 hours caught a total of 41 marketable size king crabs and in Esther Passage where 9 pots at 52 to 90 fathoms for 20 hours caught a total of 30 marketable-size king crabs.

## Oregon

OTTER-TRAWL MINIMUM MESH SIZE SET FOR DOVER SOLE: A minimum mesh size of 4.5 inches (measured between the knots) was adopted by the Fish Commission of Oregon to become effective in 1954. This regulation was the result of studies by the states of Oregon, Washington, and California under the auspices of the Pacific Marine Fisheries Commission, a coordinating body for mutual fishery problems of the three states.

Cooperative mesh experiments were conducted aboard the California Fish and Game's research vessel N. B. Scofield in the early summer of 1954. Earlier studies had also been made. These experiments were designed to determine, if possible, a mesh size that would minimize the waste of young sole at sea. In the catches made with experimental nets, the proportion of marketable fish in the total catch ranged from 31 percent with a 3-inch mesh to 98 percent with a 4.5-inch mesh. However, for any single mesh size the percentage of marketable fish in the catch varied, presumably owing to change in size composition of fish on the grounds.

From studies of the discard at sea by commercial vessels, the average discard of Dover sole in 1953 was estimated to be 25 percent by number. In making this estimation, the various mesh sizes used by members of the Oregon fleet have been taken into consideration.

The otter-trawl fishery of Oregon produces some 20 to 30 million pounds of bottom fish annually. This represents approximately 25 to 30 species of flat and round fish. During the postwar years the Dover sole (Microstomus pacificus) has been the principal flatfish sought by the fishermen. An average of approximately 4 million pounds of this species was landed annually in the period 1946-52. The peak year was 1951, during which 8.5 million pounds were landed.

The fillet plants impose a minimum size upon each species of sole that they purchase, basing these sizes on a profitable return of filleted meat from the whole fish. The fishermen in turn select for their nets a mesh size that will insure the capture of all, or practically all, the sole equal to and larger than these minimum sizes. Unfortunately, the selective action of the nets is such that a considerable number of fish smaller than the minimum size are also caught and must be sorted from the catches and discarded at sea. Most, if not all, of these fish are dead when discarded.

The total catch of Dover sole in Oregon for the period 1946-52 was 33.1 million pounds, equivalent to 16.6 million fish. If 25 percent is a reasonable estimate of the discard at sea, 5.5 million small Dover sole were wasted during this 7-year period.

As most of these discarded fish would have reached a marketable size in 2 or 3 years, and were capable of doubling their weight in 5 years, the loss to the fishermen was significant.

It is believed that this minimum-mesh-size regulation will materially help the fishermen to utilize their fishery resource more economically.

Note: Also see Commercial Fisheries Review, October 1954, p. 24.

## Pacific Oceanic Fishery Investigations

DEFECTIVE STEEL LONG LINES RESPONSIBLE FOR POOR COMMERCIAL TUNA CATCHES IN LINE ISLANDS ("Oceanic" and "Brothers" Cruise 2; "Commonwealth" Cruise 1): Defective steel long-line gear was responsible for poor tuna catches by commercial vessels in the Line Islands area. The commercial vessels exploiting these new tuna grounds sailed from Honolulu on July 14 and returned August 21--the Oceanic and Brothers are 48- and 49-foot Alaska halibut boats and the Commonwealth is a 110-foot converted sailing schooner.

The steel long-line gear handled well but did not retain enough of the hooked tuna to produce satisfactory catches. This was evident from broken droppers, leaders covered with slime from fish that had escaped, and wear and tear on the main line out of proportion to the size of the catches. Further, a break-link test suggested that less than one-third of the hooked fish were landed. It appeared that the steel did not have enough resilience, nor did it offer enough friction when pulled through the water to effectively dampen the frantic struggle of a freshly hooked tuna. As a consequence fish were frequently lost or the gear was broken.

The three vessels fished a total of 29 vessel days, mainly in the near vicinity of Christmas Island although fishing was conducted as far as 70 miles offshore. Each vessel averaged about 500 hooks a day with a total of about 14,700 hooks for the trip.

Fishing yielded 240 yellowfin tuna of which 32 or 13 percent were damaged by sharks. The over-all catch rate was 1.63 per hundred hooks. The average weight of the catch was about 100 pounds and the total catch of the 3 vessels about 10 tons.

There were some differences in the catch rates of the three vessels. The Commonwealth and Oceanic averaged about 2 yellowfin tuna per 100 hooks and the Brothers only 1 per 100 hooks.

The yellowfin tuna catch was comprised of two size groups of fish; a smaller group averaging about 60 pounds each probably represented surface schools, and a group averaging about 125 pounds each probably drawn from the deep-swimming population.

In addition to the long-line fishing, four vessel days were devoted to trolling around Christmas Island. This fishing yielded 30 yellowfin tuna averaging 60 pounds each in weight.

The captain of the Commonwealth expressed the opinion that, despite the disappointing catch made by his vessel, there were tuna to be taken on the Christmas Island grounds if the right type of fishing gear were used. He said that he plans to modify his long-lines in such a way as to put more play into them and then make another cruise south in the near future.

This venture, which was only the second attempt at commercial exploitation of the equatorial tuna grounds explored and charted by research ships of the U. S. Fish and Wildlife Service's Pacific Oceanic Fishery Investigations, produced a total of about 10 tons of yellowfin tuna and small amounts of marlin and miscellaneous fish. The catches were far below the averages established by experimental fishing in the area, and also compared very poorly with the results of an earlier commercial operation by West Coast boats. This lack of success was all the more unlooked for since the data gathered by Pacific Oceanic Fishery Investigations show the summer months as the season when the yellowfin tuna are at the peak of their abundance on the equatorial grounds.

The Fish and Wildlife Service biologist, who acted as observer with the Commonwealth, expressed the opinion that the poor catches must be blamed on the fishing gear used, which was of steel cable instead of the usual cotton line. He estimated that one-half to two-thirds of all the fish hooked were lost through the breakage of the branch lines or by the tearing of the hooks from the tuna's jaws.

## Pacific Salmon Investigations

ELECTRICAL DIVERSION WEIR PROVES PRACTICAL FOR SALMON: An electrical diversion weir that the U. S. Fish and Wildlife Service installed on an experimental basis on the Entiat River in Washington during 1953 has made it possible to divert a sufficient number of the adult chinook salmon into holding ponds for spawning.

Patterned after the installations made for the control of the sea lamprey in the Great Lakes, the electrical diversion weir placed in the Entiat River consists of 50 electrodes (pipe, $1\frac{1}{2}$ inches) that are suspended vertically at 3-foot intervals at an angle across the stream. A ground line (pipe, $1\frac{1}{2}$ inches) has been laid 15 feet below the electrodes, following the bottom contour of the stream and parallel to the line of electrodes. The electrical field is activated by 110-volt, 60-cycle, alternating currents.

A fishery research biologist stationed at the Salmon-Cultural Laboratory at Entiat reports that the new diversion weir has provided an adequate barrier to the upstream migration of fish during high- and low-water stages of the river.

Chinook salmon were diverted into the holding ponds much more readily by the electrical barrier than by the conventional picket weir. The longest time a recognizable fish fought the barrier before entering the ladder was two days. Blueback salmon were more reluctant to ascend the fish ladder and enter the holding ponds. Schools of 50 or more fish were observed to collect in a pool area about 200 feet below the diversion. These fish entered the ponds well ahead of their spawning time. A total of 46 steelhead were diverted into the holding ponds. Of this group, 39 were seined or fished out and liberated above the weir and 7 males died in the ponds because they escaped capture. An estimated 500 suckers spawned in the ponds. Surprisingly enough, the suckers were successful in making their escape through the V's and returned to the river. A large number of whitefish, possibly 300 to 400, entered the ponds during the spring. Some of these fish were liberated during the seining operations for steelhead, but at least half of these fish remained in the holding ponds throughout the summer and are still in the ponds. Very few trout other than large Dolly Varden trout were diverted into the ponds. The majority of this species entered the trap along with the salmon and were liberated in the river above the weir.

While the electrical diversion weir is in operation, fish that enter the field are ordinarily diverted before they pass the ground line or after they have progressed about two feet over the ground line. The location of the ground line, with reference to stream bottom and distance from the electrodes, has been established by tests to determine effectiveness in diverting upstream migrants without injury.

The weir will be used only to get fish for the spawn-taking operations at the fish-cultural station at Entiat. In accordance with the Fish and Wildlife Service's policy of utilizing any available natural spawning areas, a significant portion of the run will be permitted to escape.

## Service to Collect Holdings of Frozen Blocks

The Bureau of the Budget has granted permission to the U. S. Fish and Wildlife Service to collect data on the cold-storage freezings and holdings of fillet blocks and slabs used in the production of fish sticks or portions. These data will be collected monthly, beginning with October 31, 1954, and will be published in the Frozen Fish Report, a monthly statistical bulletin issued from Washington, D. C.

## Shrimp Film Released by Fish and Wildlife Service

An educational film titled Shrimp Please, sponsored by the U. S. Fish and Wildlife Service and the shrimp industry of Louisiana and Mississippi, was made available for showings in late September.

Some scenes from the motion picture, Shrimp Please.

Designed to stimulate consumer interest in shrimp, the film depicts Gulf of Mexico shrimping operations, canning, breading, drying, and freezing processes, and the many methods of preparing shrimp for the dinner table. Release of the picture is aimed at creating additional markets for shrimp.

Produced in sound and color, the 16 mm. film has a running time of about 18 minutes. Previews for the sponsoring groups have been completed. Wide distribution of prints is planned. More than 100 copies will be available for public showings and television use. Distribution to the 60 film libraries which handle Service-sponsored films will be made, and special emphasis will be placed on TV outlets.

Prints of Shrimp Please will be available without charge on a loan basis for showing in the United States from the Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C. Further information and facts on other films in the commercial fisheries series will be found in a booklet titled Fishery Motion Pictures which may be obtained from the Service.

## South Carolina

OYSTER RESEARCH (APRIL-JUNE 1954): Much of the oyster research at the South Carolina Bears Bluff Laboratories involves the measuring and weighing of individual oysters or groups of oysters to determine growth and survival. Such measurements can be successfully continued through the cold months but by mid-May an almost continuous setting of young on the experimental oysters seriously interferes with accurate measurements. In years past workers at the Laboratory tried many deterrents in hopes of finding a practical means of protecting these experimental oysters from "wrap-up." DDT, anti-fouling paint, wax, oils, etc., have been tried with varying degrees of success.

This spring an attempt was made to utilize cement as a possible means of deterring or reducing the set of young oysters on the experimental oysters. The theory was that the cement would flake off as the young attached, thus leaving the original oyster clean and unencumbered by successive sets of young.

In these experiments about 200 adult oysters were treated with varying mixtures of cement ranging from pure cement and water, to three parts of mud and one part of cement. About 50 oysters were selected as controls and were left in the experimental trays without handling or dipping in the cement or cement mixture. Of these, 1.6 percent died during the time of the experiment. About 50 oysters were removed from trays, handled, and exposed to drying but were not treated with cement. About 20 percent of these died. One hundred oysters were handled, dipped in cement and left exposed to the air until the cement had dried (usually overnight). Of these 91.1 percent of the oysters died. This indicates that cement is too drastic a treatment to use to protect experimental oysters. One interesting feature of the experiment which deserves further examination is the death of 20 percent of the oysters which were not treated with cement but only handled, culled, and exposed to air.

SHRIMP RESEARCH: Offshore Waters: A total of 91 standardized trawls were made at fixed stations during the period April-June to gauge the relative abundance of shrimp by months in offshore waters, sounds, bays, and in rivers of South Carolina. Size variations and growth of shrimp in both the commercial catches and in the experimental trawls were carefully watched. Since the first part of June studies on the composition of commercial shrimp catches have been intensified and work on the selectivity of nets and gear was renewed.

Salt Water Ponds: Continuing experiments on the productivity of impounded salt-water ponds, the smallest of the ponds at Bears Bluff was lightly stocked with white shrimp (Penaeus setiferus) on February 24, 1954. The pond was emptied on May 4. Briefly, this experiment showed that 37 percent of the shrimp died during this time but growth more than balanced mortality, and for every pound of shrimp stocked $1\frac{1}{2}$ pounds of shrimp were taken out. This growth in excess of mortality is much less than found in previous experiments carried out in the summer. There are two possible explanations: (1) slow growth due to colder water (average water temperature for March and April--20° C.; for July and August--31° C.); and (2) the larger size of the shrimp stocked for this experiment (96 count as against 500 to even 700 count in some of the previous warm-weather experiments). The size increase during this experiment was about $1-1\frac{1}{2}$ inches. The average length of the February shrimp stocked was $4-4\frac{1}{2}$ inches; the average length of the May shrimp harvested was $5\frac{1}{2}-6$ inches.

This experiment, if converted into economic terms, indicated that for every 30 cents worth of shrimp stocked in February, despite mortality, 75 cents worth of shrimp was harvested in May. The price of shrimp comparable in size to those stocked on February 24 was 30 cents a pound; shrimp comparable in size to those harvested on May 4 was 50 cents a pound.

Biologically it is of great interest to note that the majority of shrimp harvested had fairly mature gonads--males with well developed spermataphores and the females in the yellow and brown stage of roe development. It should be noted that this development took place in inshore, impounded waters, ranging in salinity from a low of 22.5 p.p.t. to a high of 28 p.p.t. It should be further noted that this gonadal development is not necessarily a result of impoundment in the experimental pond since at the time of harvesting of the pond shrimp, female P. setiferus with well developed roe were being taken in trawl nets in the Wadmalaw River near the pond. The salinity of the Wadmalaw River is practically identical with that found in the experimental ponds.

## South Pacific Fishery Investigations

MOVED TO LA JOLLA, CALIFORNIA: The South Pacific Fishery Investigations of the Service's Branch of Fishery Biology moved their headquarters from Stanford University to La Jolla, California, on the campus of the University of California's Scripps Institution of Oceanography.

The change of headquarters will allow a closer coordination of research activities of a cooperative study of California marine resources. Major emphasis of the study is on the Pacific sardine and associated species, such as the anchovy, jack mackerel, Pacific mackerel, and hake.

Other participants in this program are the California Department of Fish and Game, the California Academy of Sciences, and Hopkins Marine Station of Stanford University.

Several members of the South Pacific Fishery Investigations have been located at Scripps Institution's annex at Point Loma for the past five years.

## U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JULY 1954: United States imports of fresh, frozen, and processed edible fish and shellfish during July 1954 amounted to 82.5 million pounds (valued at $17.9 million), according to the July 1954 United States Foreign Trade, a Department of Commerce publication (see table). July imports were 16.7 percent higher in quantity but 11.0 percent lower in value when compared with the previous month's imports of 70.7 million pounds (valued at $20.1 million). Compared with a year earlier, July imports were higher by 10.1 percent in quantity but lower by 6.3 percent in value.

United States Foreign Trade in Edible Fishery Products, July 1954 With Comparisons

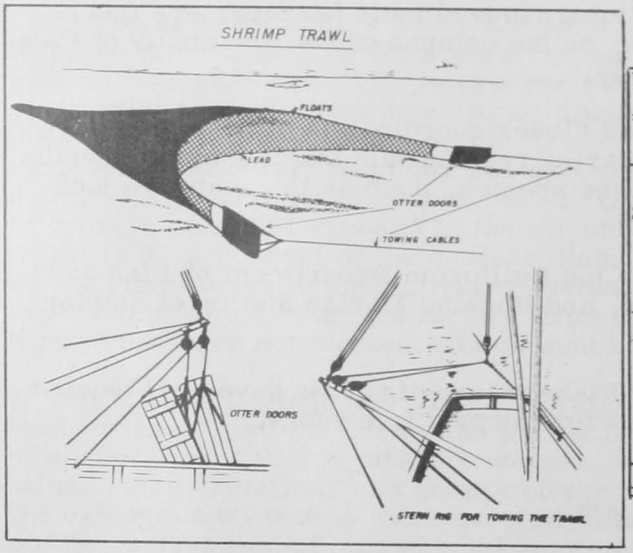
| Item | July 1954 | | July 1953 | | Year 1953 | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| | 1,000 Lbs. | Million $ | 1,000 Lbs. | Million $ | 1,000 Lbs. | Million $ |
| IMPORTS: | | | | | | |
| Fish & shellfish: Fresh, frozen & processed 1/ | 82,458 | 17.9 | 81,806 | 19.1 | 724,656 | 193.2 |
| EXPORTS: | | | | | | |
| Fish & shellfish: Processed 1/ only (excluding fresh and frozen) | 3,268 | 0.8 | 3,988 | 1.1 | 58,920 | 14.4 |

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

Exports of processed edible fish and shellfish (excluding fresh and frozen) in July 1954 totaled 3.3 million pounds (valued at $0.8 million)--higher by 53.8 percent in quantity and 14.2 percent in value as compared with June exports of 2.1 million pounds (valued at $0.7 million). July exports were down 18.1 percent in volume and 27.3 percent in value as compared with a year earlier.

## U. S. Shrimp Supply and Disposition, 1953

The total United States supply of shrimp in 1953 amounted to 307.4 million pounds (heads on), composed of 235 million pounds caught by United States fishermen and 72.4 million pounds imported (see table). This is an increase of 5 percent as compared with the supply of 291.8 million pounds in 1952, and 19 percent higher




U. S. Shrimp Supply and Disposition (Round Weight--Heads On), 1950-53

| Item | 1953 1/ | 1952 1/ | 1951 | 1950 |
|---|---|---|---|---|
| | . . (In Thousands of Lbs.) . . . | | | |
| Supply: | | | | |
| Catch (Round Weight) | 235,000 | 227,220 | 224,316 | 191,474 |
| Imports (Round Weight) | 72,397 | 64,629 | 70,262 | 67,533 |
| Total. . . . . | 307,397 | 291,849 | 294,578 | 259,007 |
| Disposition: | | | | |
| Canned . . . . . | 58,620 | 46,730 | 44,955 | 41,918 |
| Dried. . . . . | 8,000 | 8,000 | 8,000 | 8,000 |
| Frozen . . . . . | 167,651 | 157,037 | 168,700 | 156,000 |
| Fresh . . . . . | 73,126 | 80,082 | 72,923 | 53,089 |
| Total . . . . . | 307,397 | 291,849 | 294,578 | 259,007 |

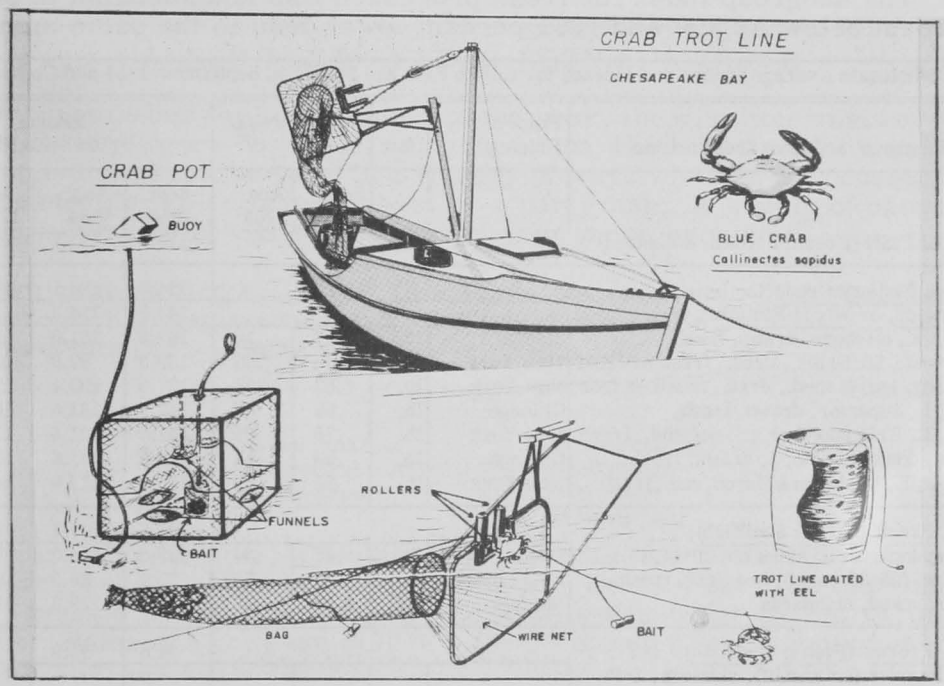
1/ Preliminary.

than 1950 when a supply of 259.0 million pounds was available. There has been a steady increase each year in the catch of shrimp, while imports have increased each year except in 1952.

Frozen shrimp comprised 55 percent of the total supply in 1953, fresh shrimp 24 percent, canned shrimp 19 percent, and dried shrimp 2 percent. In 1950 the shrimp supply was disposed of as 60 percent frozen, 21 percent fresh, 16 percent canned, and 3 percent dried.

## Virginia

BLUE CRAB CATCH DOWN: The September catch of blue crabs in Virginia was poor, the Virginia Fisheries Laboratory announced recently. Hurricane "Edna," though it caused no catastrophic damage in the Chesapeake region, did result in the loss of many crab pots, and fishing effort was reduced as a consequence.



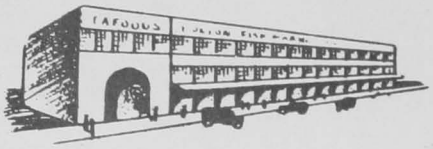

Another factor is contributing to the poor crab landings this fall--there is every indication that the 1953 year-class of crabs is below average abundance. A poor season for the winter dredge fishery of 1954/55 is predicted.

## Wholesale Prices, September 1954

With production moderate and demand good, September wholesale prices for fishery products continued their upward movement. The September 1954 over-all edible fish and shellfish (fresh, frozen, and canned) wholesale index was 113.9 percent of the 1947-49 average (see table)--2.5 percent above August and 8.6 percent higher than a year earlier.

The partial continuation of the tie-up of Boston's offshore fishing fleet the first part of September was responsible for the rise of 3.9 percent in the ex-vessel prices for offshore drawn large haddock at Boston; these prices were 45.6 percent higher than in September 1953. Except for lower prices of fresh king salmon at New York City, all other items under the drawn, dressed, or whole finfish subgroup were priced higher in September than in August. The last of the fresh Pacific halibut appear-

ing on the market in September brought higher prices, but this did not actually reflect the halibut market as a whole since frozen halibut prices were a shade lower than in August. Fresh-water fish prices in September were considerably higher because of the Jewish holidays. The September index for the drawn, dressed, or whole finfish subgroup was 7.9 percent above August and 28.2 percent above the same month in 1954.



The fresh shrimp price drop of 9.9 percent at New York City in September was attributed to liberal supplies. Shrimp prices have been dropping steadily since last March and in September were 26.6 percent below the same month in 1953. With the opening of the season on September 1, oyster prices dropped slightly. Lower shrimp and oyster prices only partially offset the very substantial increase in prices of fresh haddock fillets from August to September. The subgroup index for fresh processed fish and shellfish in September was 2.4 percent below August and 10.1 percent lower than in the same month of 1953.

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

| Group, Subgroup, and Item Specification | Point of Pricing | Unit | Avg. Prices1/ ($) | | Indexes (1947-49=100) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Sept. 1954 | Aug. 1954 | Sept. 1954 | Aug. 1954 | July 1954 | Sept. 1953 |
| ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) | | | | | 113.9 | 111.1 | 103.5 | 104.9 |
| Fresh & Frozen Fishery Products: | | | | | 124.8 | 120.1 | 109.8 | 112.3 |
| Drawn, Dressed, or Whole Finfish: | | | | | 144.9 | 134.3 | 119.3 | 113.0 |
| Haddock, lge., offshore, drawn, fresh | Boston | lb. | .17 | .16 | 167.3 | 161.0 | 119.0 | 114.9 |
| Halibut, West., 20/80 lbs., drsd., fresh or froz. | New York | lb. | .45 | .32 | 139.3 | 99.0 | 106.0 | 92.3 |
| Salmon, king, lge. & med., drsd., fresh or froz. | New York | lb. | .57 | .58 | 127.5 | 130.4 | 128.4 | 114.2 |
| Whitefish, L. Superior, drawn, fresh | Chicago | lb. | .58 | .53 | 142.5 | 131.4 | 105.4 | 154.9 |
| Whitefish, L. Erie pound or gill net, rnd., fresh | New York | lb. | .75 | .65 | 151.6 | 131.4 | 119.3 | 148.6 |
| Lake trout, domestic, No. 1, drawn, fresh. | Chicago | lb. | .53 | .53 | 108.6 | 107.6 | 104.5 | 97.3 |
| Yellow pike, L. Michigan & Huron, rnd., fresh | New York | lb. | .55 | .49 | 129.0 | 114.9 | 143.0 | 140.7 |
| Processed, Fresh (Fish & Shellfish): | | | | | 104.5 | 107.1 | 98.7 | 116.2 |
| Fillets, haddock, sml., skins on, 20-lb. tins | Boston | lb. | .41 | .34 | 139.5 | 114.0 | 74.8 | 112.3 |
| Shrimp, lge. (26-30 count), headless, fresh | New York | lb. | .49 | .55 | 77.4 | 85.9 | 93.3 | 105.4 |
| Oysters, shucked, standards | Norfolk | gal. | 5.13 | 5.25 | 126.8 | 129.9 | 111.3 | 129.9 |
| Processed, Frozen (Fish & Shellfish): | | | | | 91.6 | 93.9 | 97.6 | 101.4 |
| 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 | .31 | 95.7 | 95.7 | 100.4 | 93.0 |
| Ocean perch, skins on, 1-lb. pkg. | Boston | lb. | .28 | .28 | 111.3 | 111.8 | 116.8 | 104.7 |
| Shrimp, lge. (26-30 count), 5-lb. pkg. | Chicago | lb. | .49 | .52 | 74.8 | 80.2 | 84.1 | 101.1 |
| Canned Fishery Products: | | | | | 97.7 | 97.7 | 94.2 | 94.0 |
| Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. | Seattle | case | 19.70 | 19.70 | 104.4 | 104.4 | 99.1 | 93.9 |
| Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. | Los Angeles | case | 13.25 | 13.25 | 95.5 | 95.5 | 94.1 | 95.5 |
| Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs. | New York | case | 6.70 | 6.70 | 71.3 | 71.3 | 69.2 | 81.9 |

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.

Frozen fillet prices in September remained steady at August levels. But frozen shrimp prices continued to decline because of heavy inventories--prices dropped 6.7 percent from August to September and were 26.0 percent lower than a year earlier when inventories were very light. The September subgroup index for processed frozen fish was 2.4 percent lower than the previous month and 9.7 percent below September 1953.

Prices for the canned fish included in the index remained steady at August levels, but the September index for the subgroup was 3.9 percent higher than a year earlier. Compared with the same month a year ago, prices this September for canned pink salmon were up 11.2 percent, but for canned Maine sardines they were down 12.9 percent. Canned tuna this September was selling at the same prices as in September 1953.

## CANNED TUNA--A YEAR-ROUND FAVORITE

During this busy holiday season of the year, the wise homemaker will depend more and more on versatile canned tuna which is abundant, relatively inexpensive, and can be used in a variety of ways whether the occasion calls for a casserole, salad, sandwiches, or a party dish. A supply of canned tuna on your pantry shelf will solve many of your menu problems.

Two cans of tuna will make this excellent casserole dish recommended by the home economists of the U. S. Fish and Wildlife Service. This hearty meal-in-a-dish is as tasty as it is eye appealing.

TUNA PIE

2 7-ounce cans tuna
1 cup cooked carrots
1 cup cooked peas
1 10-ounce can condensed cream of chicken soup
1/2 cup water
1 cup biscuit mix

Drain and flake tuna. Combine tuna, carrots, and peas. Place in a well-greased casserole. Combine soup and water; heat. Pour over the tuna mixture. Prepare biscuit as directed. Drop by teaspoonful on top of the tuna mixture. Bake in a hot oven (450° F.) for 30 minutes or until biscuit topping is brown. Serves 6.

Editorial Assistant--Ruth V. Keefe Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, Irene Mainster, & Helen Joswick

* * * * *

Photograph Credits: Page by page, the following list gives the source or photographer for each photograph in this issue. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

Cover--Charles Crawford, Marine Editor, Los Angeles Times, Los Angeles, Calif.; pp. 63 & 64--R. O. Smith.