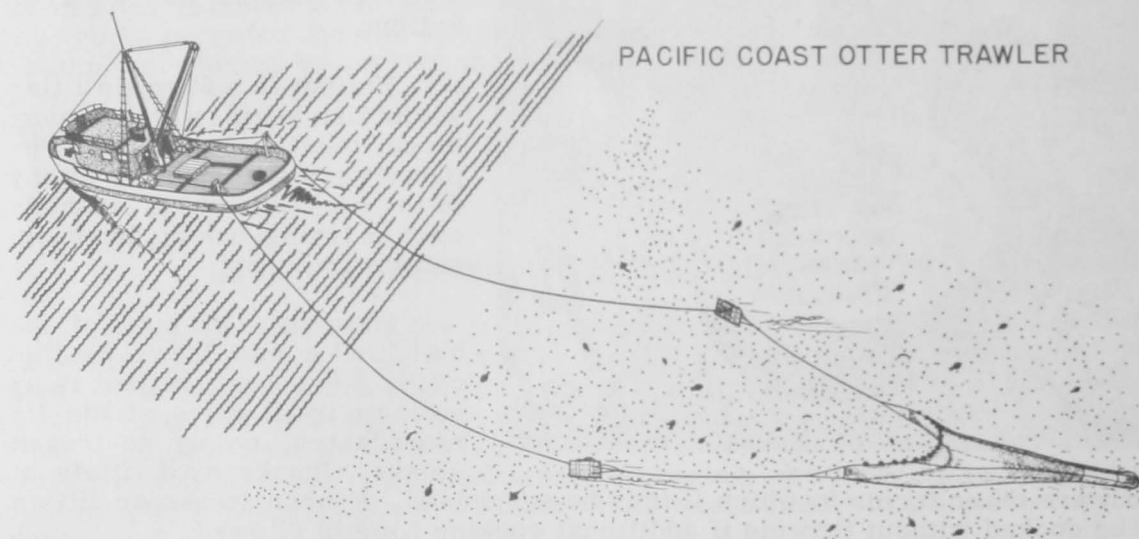


# TRENDS AND DEVELOPMENTS

## California

**DEEP-WATER TRAWLING FLEET:** Every day, weather permitting, a fleet of about 50 vessels sails from the various harbors between Eureka and Santa Barbara, Calif., to tow their nets along the bottom of the Pacific Ocean. Modern navigation and depth-sounding equipment, combined with bigger and better winches, have made it possible for these fishermen to extend their operations farther offshore. Today it is not uncommon for them to fish in depths exceeding 2,000 feet.

Over 20 different kinds of fish are caught in commercial quantities along the California coast. The total catch of this fleet has averaged well over 30 million pounds for the past several years and represents an income to the vessels of nearly \$2 million.



The trawl fleet, equipped with very specialized fishing gear, seeks fish living on or very near the bottom. In several hundred years no other type of fishing equipment has been developed to harvest sole and flounder adequately from the ocean floor. These nets derive their name, "otter trawl," from the large otter boards or kites used to spread the mouth of the net open as it is pulled through the water.

A trawl net collects everything in its path, so is often blamed for the destruction of feeding grounds, fish eggs, and young fish.

The food-producing part of the sea is the surface layer of water and the shallow areas close to shore where sunlight may penetrate, rather than offshore depths where trawling occurs. California law prohibits all trawling within three nautical miles of the coastline. This usually limits the trawl fishermen to depths greater than 100 feet and removes them from the areas of greatest food production.

Few, if any, of our ocean fishes attach their eggs to the bottom in the depths at which commercial trawlers fish. Fish inhabiting deeper water have pelagic or free-floating eggs. These eggs drift at the mercy of winds and currents and are unaffected by trawl nets. Climatic changes have far greater effect on the survival of the eggs than any action of the nets.

Perhaps the greatest criticism of otter trawls is their destruction of small fish. This charge was real. Extensive tests carried out in fishing countries all over the world, California included, have shown that small fish are caught in small mesh nets, and larger mesh nets allow small fish to escape.

In addition, larger mesh nets capture large fish in less time because a greater towing speed is possible with the lessened water resistance. Thus, fishermen benefit from a better grade of fish, less labor in sorting of the catch, and more assurance of a supply of fish for the future.

Biologists from California, Oregon, and Washington have measured thousands of fish of several species, caught with nets of various size meshes, to have a sound basis for setting up uniform mesh regulations for the Pacific Coast. Today a coast-wide minimum mesh size of  $4\frac{1}{2}$  inches (measured between the knots) is in effect. By stating what the minimum opening in the net must be, variations brought about by use of lighter or heavier twines is eliminated. A  $4\frac{1}{2}$ -inch opening gives the best balance between marketable fish and escapement.

Recent developments of underwater motion picture taking and television techniques are adding much to the store of knowledge about action of nets when fishing. What these developments reveal can have great bearing on future regulations. (Outdoor California, January 1959.)

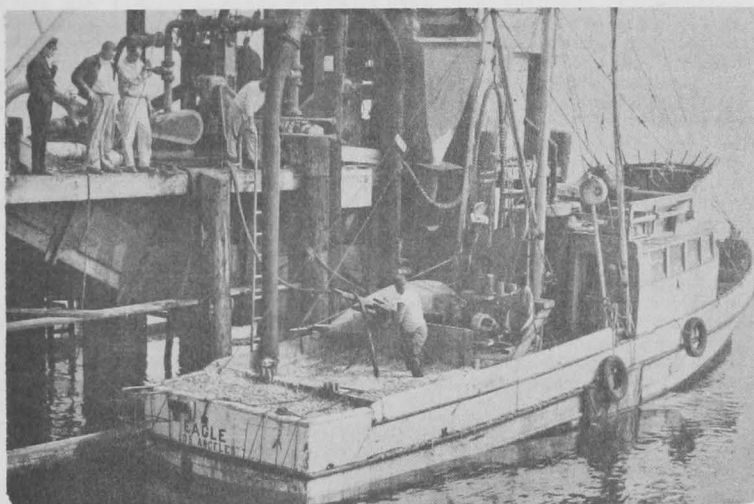
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SEASONAL FISHERY FOR SQUID: The California squid fishery is seasonal and is in full swing during the winter months. Between November 1957-March 1958 about 3.5 million pounds of squid were landed in California.

Most of the catch is canned--most of it in its own ink for export to the Philippines and Greece. For the Latin-American trade squid may be canned in hot sauce.

The squid fishery in California is a fall-to-spring business, for it is then that they congregate in dense schools to breed and spawn. During these months fishermen usually are willing to accept \$25 to \$40 a ton because more lucrative species are absent.

Most of the California squid catch is taken in Central California waters by special, small, round haul nets and goes to the markets and canneries of Monterey and San Francisco. However, the Southern California fishery is unique, generally involving smaller boats which brail the squid from the waters in much the same manner as mackerel are scooped, but without chumming.



Unloading squid at a California Terminal Island cannery. Note lights used to attract squid and the fishing racks hanging over the stern from which the squid are hand brailed.

Fishing in Southern California waters is done at night with a 1,500-watt lamp hung from the mast or boom of a drifting boat to attract the squid to the surface. In the crystal-clear waters of the Channel Islands, where most squid are captured, large concentrations of squid make it seem as though the whole sea bottom is arising from the depths and that the fishing boat will soon be aground, high and dry.

As soon as the school has surfaced, the night light is lowered to 5 or 6 feet above the water and brailing begins. The brailing is accomplished by hand, or by power if the boat is equipped with a power-driven cathead. Hand brailing is done by one or two men from fishing racks hanging over the stern. They may capture from 2 to 10 tons a night.

Boats using power brails usually are manned by three or more fishermen who operate the scoop from the deck. The brail end of the scoop is 3 or 4 feet in diameter and may be oval or round with a bag as long as 18 feet. As much as three tons may be taken with 3 or 4 passes of the scoop and as much as 30 tons may be put aboard during a single night.

Besides the use of squid for food, a large amount is used for live and frozen bait.

When squid are available, bait haulers and party boat operators frequently fish them for live bait on the sport fishing boats. Sometimes they are sought to supplement scarce anchovies and sometimes just because they are preferred over other kinds of live bait. (Outdoor California, January 1959, issued by the California Department of Fish and Game.)



## Canned Fish Consumer Purchases

**FEBRUARY 1959:** Canned tuna purchases by household consumers in February 1959, were 1,125,000 cases of which 46,000 cases were imported. By type of pack, domestic-packed tuna purchases were 224,000 cases solid, 720,000 cases chunk, and 135,000 cases grated or flakes. The average purchase was 1.9 cans at a time. About 34.3 percent of the households bought all types of canned tuna; only 1.8 percent bought the imported product. The average retail price paid for a 7-oz. can of domestic solid or fancy was 34.2 cents and for a 6-1/2-oz. can of chunk 28.2 cents. Imported solid or fancy was bought at 29.3 cents a can. February purchases were substantially higher than the 849,000 cases bought in January by 32.5 percent; retail prices were slightly lower.

During February, household consumer purchases of sardines continued to be made more through independent outlets than through chain outlets. Canned sardine purchases in February were 172,000 cases, of which 88,000 cases were Maine, 40,000 cases California, and 44,000 cases imported. The average purchase was 2.2 cans at a time for

all sardines, but 2.6 cans for Maine, 1.6 cans for California, and 1.9 cans for imported. Only 9.0 percent of the households bought all types of canned sardines; 5.3 percent bought Maine, 1.7 percent California, and 2.6 percent imported. The average retail price paid for a 4-oz. can of Maine sardines in oil was 11.2 cents, for a one-pound can of California 24.4 cents, and for a 4-oz. can of imported 25.3 cents. February purchases were up by 36.5 percent from the 126,000 cases bought in January; retail prices were lower for domestic (except Maine sardines in oil) and imported. Because of the liberal stocks of canned California sardines, there has been an increase in purchases since October 1958.

Canned salmon purchases in February 1959 were 325,000 standard cases, of which 169,000 cases were pinks and 68,000 cases reds. The average purchase was 1.3 cans at a time. About 21.0 percent of the households bought all types of canned salmon; 10.4 percent bought pinks. The average retail price paid for a 1-lb. can of pink was 53.6 cents and for red 83.4 cents. February purchases were up about 24.5 percent from the 261,000 cases bought in January.



## Clams

**NEW ENGLAND HARD CLAMS THRIVE IN FLORIDA:** An experiment of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., and the State of Florida showed that New England hard clams (*Venus mercenaria*) will thrive in Florida waters. The Laboratory sent very small clams to the State of Florida for planting. The clams not only survived but grew about five times faster than clams grow in colder northern waters.



### Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-FEBRUARY 1959: Fresh and Frozen Fishery Products: A total of 1.4 million pounds (value \$777,000) of fresh

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, February 1959 with Comparisons

QUANTITY				VALUE			
February		Jan.-Feb.		February		Jan.-Feb.	
1959	1958	1959	1958	1959	1958	1959	1958
... (1,000 Lbs.)				... (\$1,000)			
437	1,634	2,926	3,326	777	1,001	1,621	1,944

and frozen fishery products were purchased in February by the Military Subsistence Market Centers for the use of the Armed Forces under the Department of Defense. The quantity of these purchases were lower than those in January by 3.5 percent and below February 1958 by 12.1 percent.

The value of the purchases this February was 7.9 percent below the previous month and 22.4 percent below the same month a year ago.

For the first two months of 1959 purchases totaled 2.9 million pounds, valued at \$1.6 million--a decrease of 12.0 percent in quantity and 16.6 percent in value as compared with the same period of 1957.

Prices paid for fresh and frozen fishery products by the Department of Defense in February 1959 averaged 53.6 cents a pound--3.1 cents a pound less than the previous month and 7.7 cents a pound less than in the same month in 1958.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, February 1959 with Comparisons

Species	QUANTITY				VALUE	
	February		Jan.-Feb.		Feb.	Jan.-Feb.
	1959	1958	1959	1958	1959	1959
	... (1,000 Lbs.)				... (\$1,000)	
Tuna . . .	368	-	753	316	189	-
Salmon .	-	-	-	695	-	-
Sardines	25	3	37	21	9	1

Canned Fishery Products: Tuna and sardines were the only canned fishery product purchased for the use of the Armed Forces during February 1959.



### Fisheries Loan Fund

LOANS THROUGH MARCH 31, 1959: As of March 31, 1959, a total of 551 applications for fisheries loans totaling \$18,234,453 had been received. Of these, 291 (\$7,346,792) have been approved, 187 (\$5,273,789) have been declined, 41 (\$1,677,126) have been withdrawn, and 32 (\$2,987,122) are pending. As several of the pending cases have been deferred indefinitely at the request of the applicants and collections are increasing, sufficient funds are available to process all new applications when received.

The following loans have been approved between January 1 and March 31, 1959:

New England and Middle Atlantic Area: Alfred E. Wotton, Friendship, Me., \$5,936; and Edwin F. Cramer, Atlantic City, N. J., \$11,000.

South Atlantic and Gulf Area: Henry Milton Forrest, Poquason, Va., \$25,000.

California: Anthony Leonard, Napa, \$4,000; Jose da Silva, San Diego, \$60,000; Charles Strickler, San Francisco, \$5,000; and Gilbert Charles, Sausalito, \$7,600.

Pacific Northwest Area: Harold R. Jones, Everett, Wash., \$8,000; Clifford J. Errett, Seattle, Wash., \$9,000; James B. Fullilove, Seattle, Wash., \$3,000; Jesse B. Meagher, Seattle, Wash., \$11,000; and Harold C. Hansen, Seattle, Wash., \$17,000.

Alaska: Henry Anderson, Juneau, \$3,500.



### Fishways

FISHWAYS WITH STEEPER GRADIENT TO BE TESTED AT ICE HARBOR DAM: The first full-scale test of some of the research on fishways at Bonneville Dam, conducted by the U. S. Bureau of Commercial Fisheries, will soon be made at the Ice Harbor Dam on the Snake River. The fishway on the south shore of the Ice Harbor Dam will have the standard gradient of 1:16 while the fishway on the north shore will have a gradient of 1:10. The 1:10 gradient is less steep than the experimental 1:8 gradient which Bonneville Dam experiments showed was apparently satisfactory for salmon acceptance. Continuous observations will be made at both fishways to obtain comparison data on the operation and efficiency of the fishways.



### Florida

UNIVERSITY OF MIAMI AWARDED GRANT FOR MARINE RADIATION RESEARCH: A grant of \$12,000 to the Marine Laboratory of the University of Miami to be used for basic research on radium distribution in the bottom sediments and the water above in the Florida Straits, the Bahamas, and the Caribbean area, has been made by the National Seamen Foundation.

This work is to ascertain how fast radium escapes from the sediments. It is produced by a thorium isotope which has been precipitated in the ocean waters. This originates from the uranium contained in all ocean waters.



### Food Poisoning

COMMERCIAL FISHERIES BUREAU DIRECTOR STATES FLOUNDER FILLETS NOT DIRECTLY RESPONSIBLE FOR FOOD POISONING: It is regrettable that the recent publicity centering around the alleged food poisoning in New Jersey resulting from the use of flounder fillets has marred the splendid and progressive steps that this Nation's commercial fishing industry has taken to provide the consumer with the finest quality and widest variety of nutritional, high-protein, low-calorie fish and shellfish, stated Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, late in March.

McKernan further stated that he would await the investigation of the U. S. Food and Drug Administration with respect to the use of sodium-nitrite in this particular lot of fish since that agency is the one charged with the responsibility for protecting the foods sold in this country from adulteration. The Bureau had been in continuous contact with officials of the Food and Drug Administration from the very earliest report emanating from the food poisoning case in Haddon Heights, N. J., near Philadelphia, Pa. and confirmed the statement of John L. Harvey, Deputy Commissioner of Food and Drug, to the effect that the public has no cause for apprehension about the wholesomeness and safety of fish available in stores throughout the country.

The question of the use of sodium nitrite as an additive in fishery products in the United States has been carefully explored and so far its use has been outlawed. By exercising adequate controls on fish and shellfish from the time they are actually taken from the water until the time they reach the consumer there is no need for any such additives. Sodium nitrite is used in very limited quantities and under very careful supervision on fishery products in some other countries. It is also used as a preservative on certain types of meat products in this country.

It is unfortunate, McKernan further stated, that this case, which was local to the Philadelphia metropolitan area, received such widespread publicity throughout the Eastern seaboard, but on the other hand he commended the Food and Drug authorities and the local health officials for alerting the public to a potential hazard.

McKernan stated he wants the public's interest safeguarded by having consumers assured only of the highest quality fish. He indicated that this policy of the Bureau would be reiterated at the annual convention of the National Fisheries Institute in New York City, April 12-15. At that time a major portion of the nation's fresh and frozen fish producers and processors will be assembled to discuss mutual industry interests. In my opinion, McKernan stated, this matter must be given major consideration at the meeting.

Director McKernan also called attention to the program for voluntary standards for fishery products which has been established by the Bureau and adopted by various segments of the commercial fishing industry. This is further assurance that fishery products reaching the consumer are of the very highest quality. Products bearing the USDI Grade A symbol, stated McKernan, are packed under continuous inspection of U. S. Department of the Interior inspectors and will bring the ultimate in wholesomeness. The fishing industry feels so strongly about the establishment of these voluntary standards that it has petitioned the Bureau through a national trade association to increase this type of inspection service so the consumer will have complete confidence in fishery products.

The country's consumption of fish and shellfish showed a very encouraging increase this past year indicating the growing reliance that is being placed on fishery products in the home, restaurants, and other eating places.

McKernan stated the best evidence of the desire of the Philadelphia metropolitan area fish industry to keep pace with modern technological and merchandising practices is its plan to move into the new multimillion dollar Philadelphia Market Center when it is ready for occupancy within the next few months. The plans call for the most sanitary fish-handling facilities and will even include a test kitchen where new recipes for attractive fish and shellfish meals will be prepared for distribution to household and institutional consumers.

\* \* \* \* \*

NEW YORK CITY HEALTH DEPARTMENT FINDS FISH SUPPLIES SAFE: The New York City supply of fishery products has been checked and declared wholesome and free from contamination. The Director of the Bureau of Food and Drugs, New York City Department of Health, has been informed by the Philadelphia area office of the U. S. Food and Drug Administration, that it has been definitely established that the fish which caused the poisoning in the Philadelphia and south Jersey areas late in March were processed in a Philadelphia plant and were contaminated there. None of the fish from that plant reached the New York City area.

As a precautionary measure, New York City Health Department inspectors checked all shipments of flounder fillets that arrived at the Fulton Fish Market and other wholesale outlets in that City and found no contamination in the fish. Five in-

spectors under the direction of the Chief of the Fish and Shellfish Division of the Health Department were at the Fulton Fish Market before they were open for business at 6 a.m. on March 26 to inspect fish fillets. Following the inspection, the wholesale fish dealers were permitted to distribute the products.



## Great Lakes

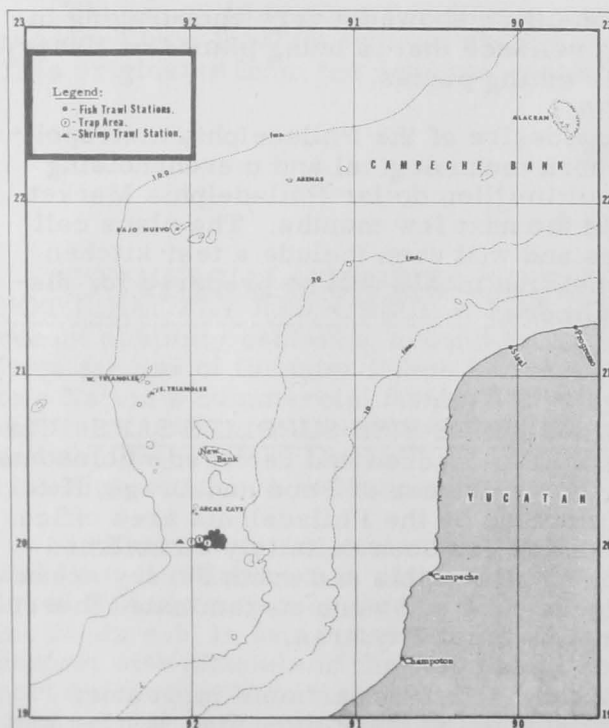
**CONTROL MEASURES IN MICHIGAN'S GREAT LAKES STREAMS TO BE CONTINUED:** The U. S. Bureau of Commercial Fisheries in February was granted permission to continue its work in controlling and destroying sea lamprey in Michigan streams tributary to three of the Great Lakes. The Michigan Conservation Department Director designated 29 upper peninsula streams tributary to Lake Superior in which the Bureau may conduct chemical treatment; 83 streams tributary to Lakes Superior, Michigan, and Huron in which the Bureau may install, maintain, and operate screens, weirs, traps, and electrical devices.

To meet its June 30, 1960, deadline for chemical treatment of all Lake Superior lamprey streams, the Bureau will discontinue operating electrical barriers in 19 streams tributary to Lake Michigan during 1959 and 1960. The Bureau expects to operate its devices in the remaining 35 streams between April 1 and July 31.



## Gulf Exploratory Fishery Program

### **EFFICIENCY OF TRAWLS VERSUS BAITED TRAPS IN RED SNAPPER FISHING ON CAMPECHE BANK (M/V Silver Bay Cruise 15):**



M/V *Silver Bay* Cruise No. 15 (Feb. 24-Mar. 12, 1959).

Comparative catch rates of baited bottom traps versus a modified New England-type otter trawl were studied by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel *Silver Bay* during a cruise (ended March 12, 1959) to Campeche Bank off the Yucatan Peninsula of Mexico.

Fifty-two trap stations were completed using conventional and modified arrowhead traps incorporating various entrance designs which were suggested by underwater television observations of snapper trap fishing by the Bureau's gear research vessel *George M. Bowers*. A total of 399 pounds of snapper and 296 pounds of grouper were taken in the 52 trap sets, with the modified traps accounting for approximately 80 percent of the total catch of 695 pounds.

Thirty-two drags were made in the same area using a modified New England-type fish trawl equipped with rollers and standard VD Rig. A total of 5,052 pounds of snapper and 803 pounds of grouper were taken during the trawling operation. Daily trawl catches averaged approxi-

mately 1,500 pounds with individual catches ranging from 20 to 1,260 pounds per 90-minute tow. Gear damage was negligible and was limited to minor tears. Adverse weather conditions greatly curtailed the fishing effort throughout the trip.

Table 1 - Weight Tabulation of Snapper and Grouper Catch by Trawl (M/V Silver Bay Cruise 15)

Species	Common Name	Total Weight	Average Weight of Fish	Weight Range of Individual Fish
.....(Pounds).....				
<i>Lutianus aya</i> . . . . .	Red snapper	3,565	8	1-20
<i>Lutianus analis</i> . . . . .	Mutton or King snapper	1,125	10	6-18
<i>Lutianus synagris</i> . . . . .	Lane or Rainbow snapper	289	1½	1-3
<i>Lutianus griseus</i> . . . . .	Gray snapper	27	5	2-15
<i>Lutianus apodus</i> . . . . .	Schoolmaster	15	15	15
<i>Lachnolaimus maximus</i>	Hogfish	31	8	6-12
	Total Snapper	5,052		
<i>Epinephelus morio</i> . . . . .	Red grouper	77	8	4-12
<i>Epinephelus nigretus</i> . . . . .	Warsaw	10	10	10
<i>Mycteroperca bonaci</i> . . . . .	Black grouper	30	15	15
<i>Mycteroperca falcata</i> . . . . .	Scamp	176	8	2-10
<i>Promicrops itaira</i> . . . . .	Jewfish	510	250	225-300
	Total Grouper	803		

\* \* \* \* \*

TRAWLING FOR MIDWATER INDUSTRIAL FISH STOCKS BETWEEN MISSISSIPPI DELTA AND CAPE ROMANO, FLA. (M/V Oregon Cruise 57): A total of 57

midwater trawl and two night-light stations were made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon in the 5-40 fathom depth range from the Mississippi Delta to Cape Romano, Fla., from February 24 to March 18, 1959. The cruise was part of a series of cruises planned to discover off-the-bottom stocks of fish suitable for reduction, pet food, or canning.

Twenty-four tows in the Pass-a-Loutre-Chandeleur Island area (Mississippi Delta) yielded 6,570 pounds of mixed razorbellies (*Harengula pensacolatae*), thread herring (*Opisthonema oglinum*), anchovies (*Anchoa* sp.), pinfish (*Lagodon rhomboides*), and menhaden (*Brevoortia patronus*). Individual catches ranged from 10-1,050 pounds per tow. One tow in 10-20 fathoms contained 870 pounds of menhaden. Off Dauphin Island, Miss., five tows produced only small amounts of anchovies.



M/V Oregon Cruise 57 (February 24-March 18, 1959).

The gear used in the trawling operations consisted of 40- and 60-foot square midwater trawls with mesh sizes tapering from 5 inches in the wings to ½ inch in



the cod end. A 500-watt lamp suspended approximately two feet above the surface was used for light-attraction studies.

Fairly dense concentrations of round herring (*Etrumeus* sp.) and Spanish sardines (*Sardinella anchovia*) were indicated on the vessel's electronic fish finders in 10-12 fathoms west of Cape San Blas, Fla. Five tows in this area, however, failed to produce catches of any significance.

A total of 23 tows was completed in the 10- to 30-fathom depth range between Cedar Keys and Cape Romano, Fla. Failure to locate midwater fish in this area by echo-sounding was reflected in the catch which averaged approximately 10 pounds of mixed round herring, thread herring, and Spanish sardines per tow. In this area heavy concentrations of mixed small round herring and anchovies were attracted by night lights on two occasions. No attempt was made to capture any significant quantity of these fish due to the lack of suitable gear.

Surface schools of fish which are normally abundant at this season were notably absent in the areas surveyed. This may be attributed to the adverse weather conditions that prevailed throughout the cruise.

Numerous samples were collected and preserved for future laboratory study by Bureau biologists and technologists.



### Irradiation Preservation

GRANT FOR STUDY OF SEAFOODS FOR ARMED FORCES: A new grant of \$14,000 has been made to Oregon State College to study irradiation-preservation of seafoods for the Armed Forces. The research (sponsored by the Quartermaster Food and Container Institute) could extend the market for fresh Oregon crab meat and provide fresh-tasting fish products for Army menus in distant areas.



### Maine Sardines

NEWSPAPER ADVERTISING CAMPAIGN LAUNCHED: A 10-week newspaper advertising campaign for Maine canned sardines in 35 key markets from coast to coast was launched on March 17, 1959, by the Maine Sardine Council. The schedule calls for five insertions of 1,000-line color ads in each of 53 newspapers to be run on alternate weeks, and the budget is in excess of \$200,000.

The copy will contain a maximum of art and a minimum of type and will be built around the nutrition values, flavor, convenience, and versatility of the product. The industry's history-making quality-control and grading program will also be featured along with a punch line that "Americans Are Now Eating More Than 125 Million Maine Sardines a Month."

The campaign was designed to boost consumption during the traditionally good spring sardine selling months, as well as to stimulate trade and consumer interest in the product for the 1959 pack season which gets under way in late May.

The markets to be covered are: Atlanta, Baltimore, Bangor, Birmingham, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Columbia (S. C.), Dallas, Jackson, Houston, Jacksonville, Los Angeles, Memphis, Milwaukee, Minneapolis, Mobile, New

Orleans, New York, Newark, Oakland, Philadelphia, Portland (Me.), Richmond, St. Paul, St. Louis, San Antonio, San Francisco, Shreveport, Toledo, and Washington.



## Menhaden

**ATLANTIC FISHERY TRENDS IN 1958:** The most striking feature of the menhaden fishery late in the summer of 1958 was the failure of the September-October "run" of large fish in southern Long Island waters. From 1952 through 1957, large old fish which occurred in the summer fishery farther northward appeared along the southern Long Island coast in September, where they provided excellent fishing through mid- or late October. No one knows why the run failed to materialize in 1958.

The fishery in the fall of 1958 off the North Carolina coast was exceptionally good. The catch, based on preliminary data, was about 1,500 tons below the record set in 1956.

Data for 1958 on menhaden (which are used almost exclusively in the manufacture of meal and oil) reveal several interesting things. Two-year-old fish comprised a substantially greater proportion of the Chesapeake Bay catch than in any previous year (about 60 percent). Two-year-old fish in the Middle Atlantic attained the largest size in any year for which the U. S. Fish and Wildlife Service has data. Two-year-old fish constituted the bulk of the fall catch off the coast of North Carolina.

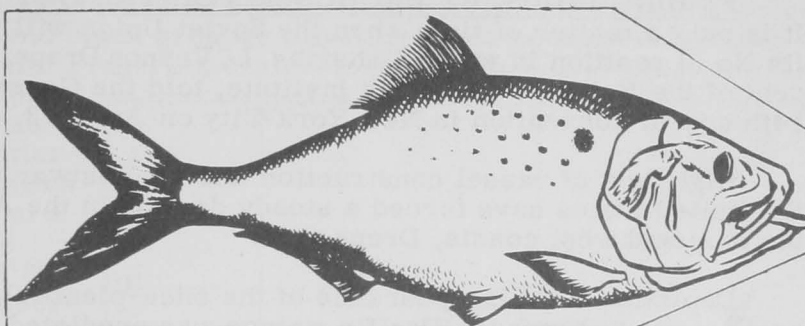


Fig. 1 - Menhaden (*Brevoortia tyrannus*), is similar in appearance to the herring, has a black spot just back of the head on each side, ranges in size from 5 to 8 inches, which make up most of the present catch, to a maximum of 18 inches.

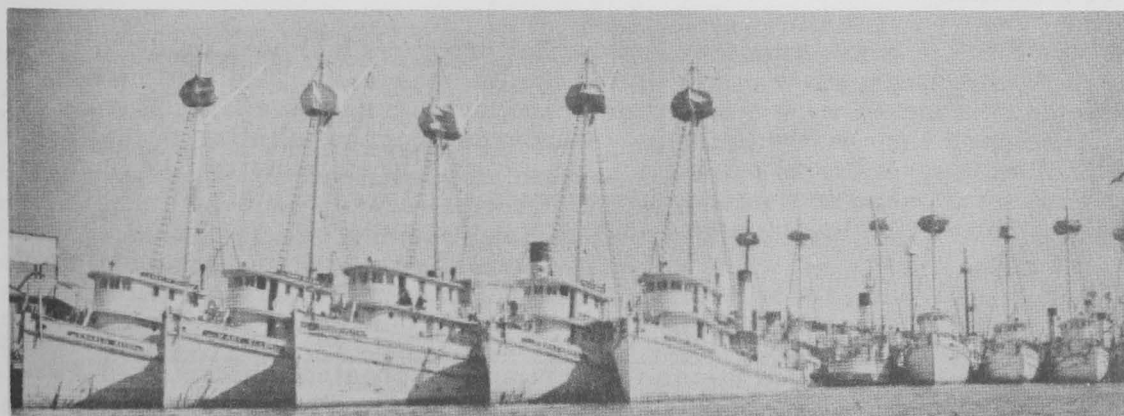


Fig. 2 - Part of the menhaden fleet at Beaufort, N. C., a center of menhaden operations.

For the past three years two-year fish have contributed substantially to the Chesapeake Bay fishery during the first part of the season. However, by early August these were replaced by one-year-old fish. This shift in age composition did not occur in 1958. This indicates that the 1956 year-class was either unusually abundant or the fish failed to move out of the Bay as indicated in the past. The result was that the two-year-old fish were chiefly responsible for the increased yield in the Bay.

In 1958 the Middle Atlantic fish were larger than they have been for the last six years. No one knows whether the increased growth represented generally better feeding or other environmental conditions or resulted from a lower population abundance. These larger-than-usual two-year-old fish appeared also in the North Carolina fall fishery and made the largest contribution to the catch in that area in both weight and number.



### National Fisheries Institute

#### FISHING INDUSTRY PROBLEMS POINTED OUT BY INSTITUTE PRESIDENT:

It is only a matter of time when the Soviet Union will push the United States out of its No. 2 position in world fisheries, L. Vernon Drape, New Bedford, Mass., president of the National Fisheries Institute, told the General Session of the group at its 14th annual convention in New York City on April 13.

High cost of vessel construction and the postwar trade and defense policies of the United States have forced a steady decline in the American fishing fleet on both the east and west coasts, Drape said.

Depletion and disappearance of the once-plentiful halibut whose last stand is being made in Northern Pacific waters was predicted by Drape with the denunciation of the recent invasion of these waters by a Russian fleet of from 50 to 75 trawlers.

"While we recognize that these are international waters, the Pacific halibut resource has been maintained only because United States and Canadian fishermen restrict their catches through regulations formulated under an international treaty. Fishermen of the two nations strictly adhere to an annual fixed quota of halibut. When the quota is reached, the season is closed," Drape explained.

Drape told the convention that, "should Russia continue to fish these waters without regard to seasons or regulations, the North Pacific halibut will be depleted beyond restoration."

Drape told the convention that substantial progress had been made in the marketing of fishery products with the United States consumer. The National Fisheries Institute has embarked upon a program in cooperation with the U. S. Bureau of Commercial Fisheries for a revolutionary standards program similar to that proved so successful with agricultural products. He stated, "in an industry like ours, it is a never-ending vigilance and an absolute essential that we maintain the best quality from the time the fish are removed from the water until they reach the dinner table."

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ORDERLY SHRIMP MARKETING URGED AT ANNUAL CONVENTION: The unceasing demand in the United States for shrimp has created a booming market into which a word of caution was injected on April 13, by the President of the Shrimp Association of the Americas. The Association held its meeting at the same time as the 14th annual convention of the National Fisheries Institute in New York City.

The Association President called for "a more orderly increase" in bringing the shrimp to market in contrast to the 22½ percent jump in imports last year and the accompanying vigorous fishing of shrimp beds throughout the world.

United States shrimp imports from all sources in 1958 rocketed to 85.4 million pounds, up from 69.7 million pounds for the same period in 1957.

"It was only a short time ago that we considered 150 million pounds of shrimp annually the top of the market. We are now consuming 210 million pounds and there appears to be no end in sight," said the Association's President. He also called for extension of international agreements and conservation laws to insure a continued source of supply of this vital protein food.



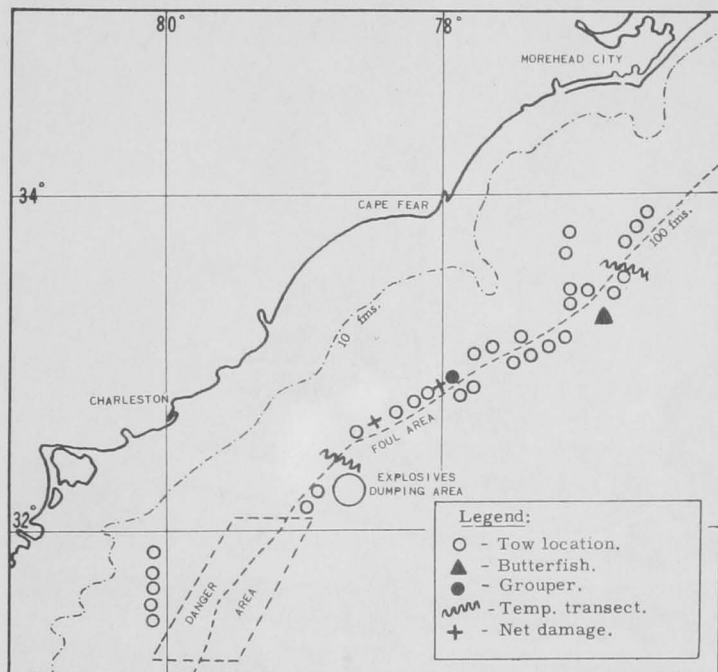
## North Atlantic Fisheries Exploration and Gear Research

**COMMERCIAL QUANTITIES OF BUTTERFISH AND GROUPER FOUND OFF CAPE FEAR, N. C. (M/V Delaware Cruise 59-2):** Commercial quantities of butterfish (*Poronotus triacanthus*) and black grouper (*Mycteroperca bonaci*) were taken by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during a February 16-March 2, 1959, cruise. A total of 4,000 pounds of small and medium-size butterfish were taken in one tow 60 miles east-southeast of Cape Fear at a depth of 150 fathoms (latitude  $33^{\circ}22'$  north, longitude  $76^{\circ}54'30''$  west), and 400 pounds of grouper were taken in another tow 60 miles south of Cape Fear at depths ranging from 96 to 100 fathoms (latitude  $32^{\circ}51'$  north, longitude  $77^{\circ}58'$  west). Other tows yielded quantities of small squid (*Loligo pealii*), round herring (*Etrumeus sadina*), and chub mackerel (*Pneumatophorus colias*), but these and other species were not taken in commercial quantities.

This cruise was the second exploratory cruise made off the coasts of the Carolinas and Georgia by the Delaware. The first cruise was made in February 1958

and was marked by an excellent catch of red snapper (*Lutianus* sp.) southeast of Cape Lookout; the species was not found during the 1959 cruise. The prime objective of the second cruise was to expand the survey along the edge of the Continental Shelf in this area for commercial concentrations of fish and to resample the areas previously worked. However, some sampling was done in more shoal water for comparative purposes. Tows were made at 34 stations using a standard No. 41 otter trawl equipped with 45 feet of wooden rollers and a small mesh liner in the cod end. The rollers helped to minimize damage to, and loss of, gear which was nevertheless considerable. The area surveyed included a considerable amount of unfishable bottom in the deeper water. A complete net was lost in 81 fathoms (latitude  $32^{\circ}34'$  north, longitude  $78^{\circ}31'$  west), and extensive damage to the lower wings and bottom belly of the net was incurred in 98-100 fathoms (latitude  $32^{\circ}53'$  north, longitude  $77^{\circ}55'30''$  west).

In addition to the 34 trawl stations, two oceanographic transects were made. Bottom-water temperatures recorded on similar transects during the 1958 cruise indicated that the water was warmer at the 75-fathom depth than at shallower or greater depths. This year's data failed to indicate the presence of this warm-water intrusion. With but one exception, all bottom-water temperatures taken at the 75-



M/V Delaware Cruise 59-2 (Feb. 16-Mar. 2, 1959).

fathom depth were in close agreement with those taken from adjacent deeper and more shallow depths. Butterfly fish and other tropical species which were present in the same areas last year, were not found this year. It has been reported by local fishermen that the southerly current flow along the coast seems to be much stronger than in previous years.

### North Pacific Exploratory Fishery Program

**FISHING GEAR RESEARCH PLANNED IN PUGET SOUND (M/V John N. Cobb Cruise 41):** Gear research studies will be made by the U. S. Bureau of Commercial Fisheries Exploratory fishing vessel John N. Cobb from February 9-March 27, 1959, in Puget Sound. The studies will be made in the shallow water areas of Puget Sound, including East Sound, Holmes Harbor, Hood Canal, or other areas exhibiting desirable bottom and water characteristics.



The John N. Cobb, a vessel operated by the Service's Bureau of Commercial Fisheries.

Studies will include use of otter trawls (modified to increase their efficiency) to determine their effectiveness under actual fishing conditions. Evaluations are to be made of the degree to which horizontal and vertical spread is affected by the net modifications. Three different types of otter-trawl doors will be tested to determine the importance of design in spreading the trawl.

Tests will be evaluated by SCUBA divers while working from a sea sled. The divers will read and record force measurements taken at various points on the trawls, as well as noting the operating characteristics of the trawls. Still and motion pictures will be made to aid in the final evaluation of the underwater tests on the otter-trawl gear.



### Pacific Oceanic Fishery Investigations

**OBSERVATIONS ON CALIFORNIA CURRENT EXTENSION IN VICINITY OF HAWAIIAN ISLANDS CONTINUED (M/V Hugh M. Smith Cruise 50):** In an effort to delineate the California Current Extension, the U. S. Bureau of Commercial Fisheries research vessel Hugh M. Smith on cruise 50 (which ended February 10, 1959) conducted operations in the area  $13^{\circ}$  N. to  $23^{\circ}$  N. latitude,  $147^{\circ}$  W. to  $170^{\circ}$  W. longitude—extending from 500 miles west of Oahu to a point 700 miles east and as far south as 600 miles. Bathythermograph and surface salinity samples were obtained at approximately 30-mile intervals.

Surface water, with salinities and temperatures which could be called the "North Pacific Equatorial" type, was found to have spread to 20° N. to the east of Hawaii. This equatorial type water to the southwest was found south of the line between 18° N., 158° W., and 15° N., 168° W. Surface waters with salinities and temperatures which could be called the "North Pacific Central" type were found to the north. The transition zone between these two water types was from 30 to 150 miles wide. Water of the California Current Extension with salinities and temperatures intermediate to the two types mentioned above, and with which it is assumed that season fish are associated, was found only in a few restricted areas.

A total of 39 stations were occupied during the cruise of which there were 11 long-line stations with 40 baskets of 11-hook gear. The remainder of the stations were 0-60 meter oblique plankton hauls. Although analysis of the significance of the data from the biological samples must await the completion of the remaining two of this series of three cruises scheduled during the advent of the Hawaiian skipjack season, the absence of season skipjack within the cruise area was strikingly evident. This absence indicates that these fish were not associated with either North Pacific Central or North Pacific Equatorial water in the vicinity of the Hawaiian Islands during the winter months and suggest that they migrate to different parts of the ocean more than 500 miles away from Hawaii.

Note: Also see Commercial Fisheries Review, September 1958, p. 62.

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TILAPIA REARING EXPERIMENTS CONTINUED: The U. S. Bureau of Commercial Fisheries tilapia plant at Paia, Maui, which had been held on a stand-by basis during January and most of February, was re-activated in late February, under terms of an agreement signed by the Maui Fisheries and Marine Products, Ltd., the Territory Board of Agriculture and Forestry, and the U. S. Bureau of Commercial Fisheries. The re-activation of the plant provides an opportunity to test methods developed at the Kewalo plant for inducing early spawning and to evaluate the cost of employing these methods on a commercial scale during the spring months when the fish are normally inactive. The Bureau's scientists hope to obtain further information regarding the utilization of the bait-size tilapia at sea as the skipjack season was very poor last year and did not provide proper conditions for testing a new bait fish.

The brood tanks were drained on February 25-27 and the adult fish, as well as the young fish which had accumulated since last December, were removed. The adults were then returned to the brood tanks in the ratio of 200 males to 600 females to a tank, which allots 4.1 sq. ft. of bottom area to each male.

Last year's operation allotted 3.6 sq. ft. per male but experiments conducted at the Kewalo plant indicated that the most productive sex ratio and brood stock concentration was a 3:1 ratio of females to males with an area of 4 sq. ft. per male. The present stocking of brood fish was, therefore, carried out in accordance with these results.

The methods developed at the Kewalo plant by the Bureau of Commercial Fisheries and the Territorial Fish and Game indicate that spawning can be induced during the winter months by increasing the water temperature. Heating elements are on order for the brood tanks at Paia and it is hoped that by increasing the water temperature a significant increase in production can be obtained during the coming spring months over that of 1958 when production did not reach a favorable level until June.

Note: Also see Commercial Fisheries Review, February 1959, p. 30.

\* \* \* \* \*

TUNA RESOURCES SURVEY IN MARQUESAS AND TUAMOTU ISLANDS AREA ENDED (M/V Charles H. Gilbert Cruise 43): The completion of a 2½-year oceanographic and fishery research program (principally to assess tuna resources) in the Marquesas and Tuamotu Islands was marked by the return to Honolulu on March 26, 1959, of the Bureau of Commercial Fisheries research vessel Charles H. Gilbert, from a 79-day trip. A United States west coast tuna clipper, the Cape Falcon under charter to the Bureau, took part in this last survey of the area to determine if tuna was sufficiently abundant for live-bait fishing on a commercial scale.

The research vessel was primarily engaged in determining the abundance of surface schools of skipjack and yellowfin along survey tracks which had been followed during previous cruises. It was found that the number of schools sighted was less than half of those reported during the same seasons in 1957 and 1958; also, that the fish were small, averaging about 6 pounds, and the schools, although large, were frequently wild and difficult to chum to the vessel.

A fishery biologist from the Bureau's Fishery Laboratory in Hawaii accompanied the Cape Falcon from San Diego, Calif., to Almejas Bay, Mexico, where 24,000 pounds of live bait were loaded prior to proceeding to the Marquesas. He reports that a total of nearly 200 schools, mostly skipjack and yellowfin, was sighted in the waters of French Oceania. The vessel caught only 16 tons in the season proven to be best from surveys made in previous years. This disappointingly low figure resulted from the comparative scarcity of schools, the small size of the fish, their wildness, and the fact that the Mexican bait was too large.

Approximately 1,000 live Marquesan sardines were released in Maunalua Bay, Oahu. This is the eighth Oahu release of these fish which were introduced as a possible supplement to the nehu, which is in short supply and is the principal live bait used by the Hawaiian tuna fishing fleet. Since the first release made in December 1955, recoveries have been made, usually by commercial fishermen during baiting operations, from waters near the Islands of Kauai, Maui, Hawaii, and Oahu. Those sardines caught near Kauai, Oahu, and Hawaii are believed to be the result of spawning in the Hawaiian area, indicating that these fish, transported from French Oceania, have been established in Hawaiian waters.



### Practical Method of Preventing a Purse-Seine Net from Sinking to Its Full Depth

One of the problems facing purse-seine fishermen is whether or not to lay out the net when fish are running in waters shallower than the net. As the purse-seine nets now used in California have a stretched depth of from 29 to 40 fathoms (174-240 feet), the only practical time nets can be layed out in shallower waters is when the bottom is sandy and free of snags. Under those conditions sets can be made in depths as shallow as five fathoms (30 feet) without any trouble. In fact, shallow sets are the most efficient, as the fish cannot sound and escape the net by going under the leads.

The problem in setting nets in shallow waters comes when the bottom is rocky, or contains other snags such as shipwrecks, old buoys or anchors, waterlogged trees, etc. Risking a net at today's prices for synthetic netting is not practical yet it is attempted many times, sometimes with disastrous results.

Usually, in order to decrease the depth to which a purse-seine net sinks, one or sometimes two strips of netting are removed from the seine. This involves a good

deal of work, usually a full day, and by the time it is done the fish may have moved to deeper water, where the shallow net cannot catch them. This type of work is frustrating to say the least, and many ideas have been tried over the years, including carrying two nets, one deep and the other shallow.

In order to eliminate the risks inherent in setting a deep net in shallow water, one of the most successful purse-seine captains fishing out of San Pedro, Calif., has devised a method of cutting down the distance the net sinks in the water. The method, which has been used for two years by this captain, is according to him very practical and has been used many times without any trouble. He uses it on both his tuna

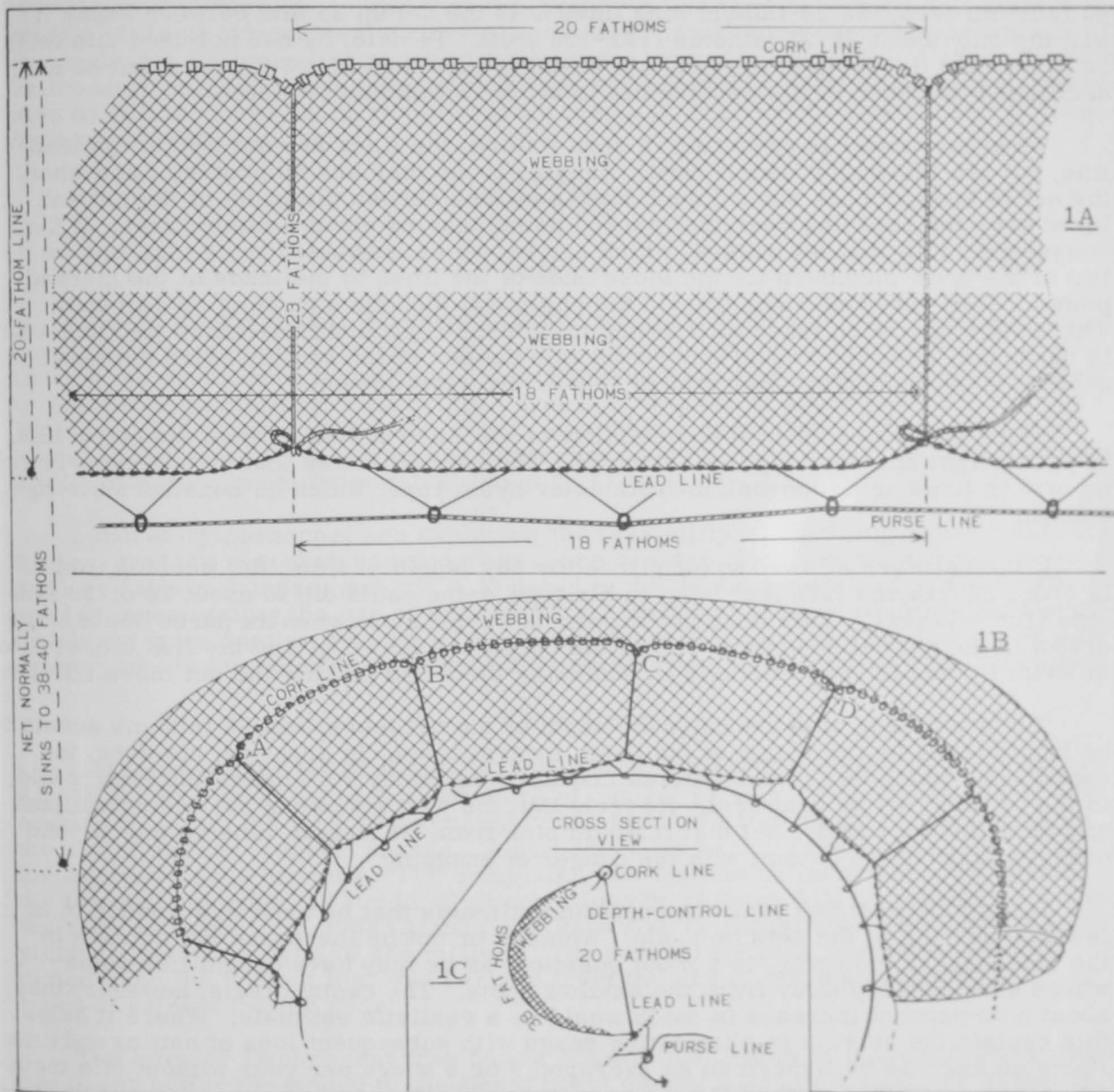


Fig. 1A - Deep purse-seine net stretched out and adjusted so that it does not sink its full depth.

Fig. 1B - Top view of deep purse-seine net shows how the webbing balloons out behind the cork and lead lines. The only visible effect is at points A, B, C, D, etc. where the corks dip slightly where the lines are tied.

Fig. 1C - Showing how the 38 fathoms of webbing balloons out behind the cork and lead lines. The purse line prevents the webbing from sinking any deeper than about 23 fathoms between depth control lines.



and sardine purse-seine nets, and it is very economical both as to time and cash-outlay. It consists of a number of 20-fathom (120-foot) long nylon ropes which are permanently tied to the cork line 20 fathoms apart. When the captain wants the depth decreased, the loose end of the nylon rope is tied to the chain lead line at a point directly across the width and inside the net. These points have previously been marked on the chain lead line by painting two or three links, and in the case of the lead line are 18 fathoms apart. The difference in the distance between ropes along the lead line from those on the cork line is due to the practice of hanging nets "in" at the lead line at the ratio of 10 to 9. This "hanging in" makes the net bag or balloon out, and is a desirable feature in purse-seine nets. On his tuna net, which is about 40 fathoms deep, the 20-fathom long lines hold the net up so that between ropes it will dip only about 22-23 fathoms (132-138 feet). To date, he had not used this method to shorten the depth of his tuna net anything less than 22-23 fathoms, but he had decreased the depth of his sardine net to about 15 fathoms (90 feet).

When the vessel is operating in deep waters, the lines are not tied to the lead line, but are allowed to dangle free. Hanging loose they are no problem, and when the net is brought back aboard each line is passed across the width of the net and layed over the lead line near the marked point, leaving about a fathom free. If the vessel goes into shallow waters, which are known or suspected to be foul, one or two of the crew members tie the loose ends of the lines to the leads at the marked points. They take two turns around the chain and then tie a running or slip knot. This entire operation takes only 2 or 3 minutes. If the lines have been tied and a set is not made, when the vessel moves out into deeper water and the extra depth is needed, it is an even simpler matter to pull the knots loose.

When questioned about the possibility of the lines breaking when the purse line is pulled tight and a strong tide is running, the captain states that he has experienced no broken lines using one-half inch diameter nylon rope, which he considers strong enough.

If the net were allowed to hang free for any length of time, the webbing, which is about 38 fathoms (228 feet long) in his tuna seine could dip to about 28 or 29 fathoms (168-174 feet). This does not happen, however, since when the purse line is being drawn in the net balloons back behind the corks and leads, giving the fish more room to swim in, and is very effective in confusing them and making the net more efficient.

The possibility of decreasing the depth of the net more than 20 fathoms seems to be limited only by the length of the depth control lines. In practice, however, the captain now using this method states that anything under 10 fathoms (60 feet) would, in his opinion, not be practical. He feels that the web would bag out behind the lead and cork lines properly, but that it would sink from its weight, closing the bag and dragging across the bottom with the danger of snagging.

During the past two years the captain estimates that he used this method in at least 20 percent of the sets he made. Whether or not he increased his catches by the same figure, however, is a moot question, as he may have caught fish somewhere else, keeping away from the shallow spots. The captain feels, however, that about a 10-percent increase in catch would be a realistic estimate. Where it helps this captain the most is in eliminating snags with subsequent loss of netting and time. Being an aggressive fisherman he averaged 3 or 4 snags per year without this method. Since using this method for the past two years, he has had none, meanwhile laying his net out in many places he would not have considered before.

--A. D. Sokolich, Market News Reporter,  
Branch of Market News,  
Division of Industrial Research and Services,  
U. S. Bureau of Commercial Fisheries, San Pedro, Calif.



## Rail Express

REQUEST FOR RATE INCREASE WITHDRAWN: The Railway Express Agency in March 1959 asked the Interstate Commerce Commission for permission to withdraw its proposed 3½-percent increase in rates, effective immediately, on the ground that even if granted it would be "totally inadequate" to cover costs. In its petition the Agency contended that it is "no longer in a position to continue subsidizing the users of express service by transporting express traffic at out-of-pocket losses." It estimates a deficit of \$38,000,000 in 1959 on an out-of-pocket cost basis.

It has also been announced that the Agency's Board of Directors will meet in the middle of April to consider various proposals for continuing express operations. The Pennsylvania Railroad has recently submitted a proposal which would grant Eastern railroads 7 percent more revenue than they are currently receiving. Legislation has also been introduced which would require the U. S. Post Office Department to take over express operations.



## Salmon

BLOOD TESTS USED TO DISTINGUISH RACIAL STOCKS: The development of serological techniques or blood tests is one of the most promising methods of attacking the problem of identifying North Pacific Ocean high-seas salmon stocks as to Asiatic or North American origin. The U. S. Bureau of Commercial Fisheries Biological Laboratory at Seattle, Wash., has done a great deal of this serological work and reports that the research progresses slowly because of the lack of adequate stocks of serum made from rabbit blood.

Laboratory personnel are exploring the feasibility of obtaining horse and goat sera so that the research can progress more rapidly. Because sera from animals such as rabbits, horses, and goats do not give the desired refinement, the Seattle staff is investigating the use of the iso-immunization technique whereby sera are developed from captive salmon. This technique will enable the researchers to develop methods for much finer discrimination between salmon races than heretofore.

\* \* \* \* \*

SALMON PACKERS IN WASHINGTON SEEK TO LIFT BAN ON FISH TRAPS IN ALASKA: The Washington State packers of canned salmon late in March 1959 were seeking to enjoin the U. S. Department of the Interior from banning or eliminating the use of salmon traps in Alaska. A suit was filed in the Federal District Court by the attorney of the canners. The complaint was that the Government order banning the traps is unlawful. A 30- to 40-percent loss in revenue will be caused by the ban, the canners report. In 1958, Alaska's salmon fishing industry is estimated to have yielded a gross revenue of \$65 million. The percentage loss in revenue was estimated to be the amount that was derived from the use of traps as opposed to other types of salmon fishing gear.

The Interior Department trap ban in Alaska was issued as a conservation measure under powers extended to the Department during Alaska's transition from a territory to a state. But the packers' complaint pointed out that such an "abrupt" change is unlawful, particularly in view of the canners' complaints that the trap ban will close six canneries and throw out of work some 2,200 persons dependent for jobs on the use of the traps. The complaint seeks a preliminary injunction as a prelude to a permanent voiding of the trap ban. The suit also explained that "no substantial increase in catch" can be expected from the use of seines or other mobile fishing gear.



## Shad

VIRGINIA AND FEDERAL BIOLOGISTS COOPERATE ON STUDY OF YORK RIVER RUN: A cooperative study of the shad run in Virginia's York River was started early this year by biologists of the U. S. Bureau of Commercial Fisheries and the Virginia Fisheries Laboratory at Gloucester Point.

The Bureau biologist, who is directing the research, outlined the purposes of the study in this way: "We want to follow changes in the fisheries. Probably four times as many drift-netters are operating in the River now as there were in 1952 when the last survey was made. Besides that we would like to check the importance of shad as a sport fish. We are always interested in knowing the abundance of shad in the run each year and records we collect this spring will be a continuation of those the Virginia Laboratory biologists have been gathering for the past several years."

Scientists have developed improved tags in the last few years which will be employed for tagging shad this spring. Instead of the metal pin used to hold two discs against the back of the fish, streamer-type tags will be used. "Fishermen will be happy to know that this streamer tag will not hang in their nets and tangle them like the Petersen disc-type did," the Bureau biologist reported. "They are also much easier to remove from the fish."

Pictures of the tag on a fish will be posted in several places along the River so that fishermen will know what to look for. The biologists anticipate tagging about



1,000 shad at the mouth of the York River. Varying numbers will be released each week during the upriver run. Tags returned from fish caught on rod and reel or in nets will enable scientists to estimate the total number of fish reaching the spawning grounds. It is in the best interests of the sport and commercial fishermen to return all tags. A reward of 50 cents will be paid for each tag returned.

Scientists will also need records from fishermen to complete their studies; therefore, a crew of four biologists will distribute log books to fishermen and ask them to keep records of their catches.

In past years, Bureau biologists have studied shad runs from the Connecticut River, Conn., to the St. John's River, Fla. "It is interesting to note," the Bureau biologists stated, "that shad entering rivers in Florida and all the way up to the Neuse River in North Carolina die after spawning. Further up the coast a larger percentage of spawned shad return to the ocean. In Chesapeake Bay, for instance, around 15 to 20 percent of those reaching the ocean after having spawned return the following year. In the Connecticut and Hudson Rivers, between 35 and 50 percent return and appear in the fishery the following year. This accounts, in part, for the larger fish usually caught in northern waters. Six- and seven-pound shad are not uncommon in the Connecticut River.

Near the close of the spawning season, fish will be tagged on the spawning grounds to help scientists determine whether the home-stream theory is true. If marked fish return in future years to the York River, it will substantiate that shad do return to their home rivers. Tagged fish also help indicate migratory patterns.



Sport Fishing

Nearly a million more fishing licenses were sold in the United States during the fiscal year ending June 30, 1958, than in the previous fiscal year, but hunting licenses showed a decline of about 154,000, the U. S. Fish and Wildlife Service reported on March 1, 1959. The combined total of 34,941,729 licenses sold to sportsmen in 1958 exceeded all previous records, and represents an increase of 746,546 over the 1957 record of 34,195,183 licenses.



The 1958 total was made up of 20,177,605 fishing licenses and 14,764,124 hunting licenses; in the previous year 19,276,767 fishing licenses and 14,918,416 hunting licenses were sold. The increase in fishing licenses amounted to 900,838; the decrease in hunting licenses was 154,292.

Total cost to hunters and anglers for all licenses, permits, tags, and stamps (not including the Federal "duck stamp") was \$99,018,130--an increase of \$8,401,091 over the previous year's total of \$90,617,039. Hunting licenses amounted to \$53,607,668 of the 1958 total while fishing licenses cost \$45,410,462.

Resident fishing licenses accounted for 17,401,982 of the total; nonresident licenses numbered 2,775,623. The States which attracted the greatest number of nonresident fishermen were Wisconsin (363,332), Minnesota (305,160), Michigan (254,658), Arkansas (167,186), Tennessee (165,257), and Florida (164,767). California led in resident fishing licenses, with 1,388,433; Minnesota was second with 1,104,591; Ohio had 876,633.

Table 1 - State Fishing Licenses Issued in the United States, July 1, 1957 to June 30, 1958

State	Fishing Licenses			Total Cost to Anglers for All Licenses, Permits Stamps, etc.
	Resident	Non-Resident	Total	
	(Number)			\$
Alabama	464,050	27,046	491,096	762,593.15
Arizona	173,412	18,250	191,662	501,403.50
Arkansas	287,713	167,186	454,899	943,579.60
California	1,388,443	20,255	1,408,698	4,112,077.00
Colorado	274,901	118,402	393,303	1,429,290.50
Connecticut	104,651	3,748	108,399	410,520.59
Delaware	9,996	1,326	11,322	23,689.50
Florida	315,432	164,769	480,201	979,127.75
Georgia	434,839	14,918	449,757	603,830.33
Idaho	172,869	64,664	237,533	916,256.50
Illinois	793,370	20,151	813,521	1,219,518.75
Indiana	796,359	38,792	835,151	1,090,004.75
Iowa	384,609	13,369	397,978	598,452.72
Kansas	243,256	6,498	249,754	511,642.75
Kentucky	334,627	81,501	416,128	780,487.00
Louisiana	159,664	29,210	188,874	260,456.00
Maine	141,447	76,598	218,045	781,648.12
Maryland	82,980	15,196	98,176	322,319.50
Massachusetts	222,817	5,419	228,236	653,746.87
Michigan	854,776	254,658	1,109,434	2,411,016.00
Minnesota	1,104,591	305,160	1,409,751	2,318,168.60
Mississippi	139,780	57,320	197,100	402,300.00
Missouri	598,441	70,124	668,565	1,792,820.00
Montana	199,731	52,902	252,633	678,086.50
Nebraska	184,303	9,780	194,083	378,847.15
Nevada	26,319	25,622	51,941	208,737.50
New Hampshire	81,977	52,976	134,953	446,610.25
New Jersey	141,540	9,922	151,462	599,416.25
New Mexico	77,807	38,237	116,044	438,264.30
New York	771,245	47,772	819,017	1,804,129.75
North Carolina	349,616	40,460	390,076	794,599.03
North Dakota	76,340	2,533	78,873	83,939.00
Ohio	876,633	25,257	901,890	1,855,485.00
Oklahoma	399,710	86,342	486,052	1,072,020.75
Oregon	349,966	27,755	377,721	1,285,322.25
Pennsylvania	656,848	29,680	686,528	1,811,506.60
Rhode Island	16,187	739	16,926	56,097.02
South Carolina	228,622	17,408	246,030	461,721.75
South Dakota	85,186	41,317	126,503	242,253.00
Tennessee	558,267	165,257	723,524	850,601.00
Texas	818,341	-	818,341	1,741,431.65
Utah	126,467	12,275	138,742	421,480.75
Vermont	72,817	36,248	109,065	260,694.75
Virginia	365,597	15,150	380,747	611,826.83
Washington	377,180	20,975	398,155	1,606,111.37
West Virginia	216,354	10,275	226,629	461,614.65
Wisconsin	748,247	363,332	1,111,579	2,788,045.25
Wyoming	113,659	68,849	182,508	626,670.50
Totals	17,401,982	2,775,623	20,177,605	45,410,462.33

Note: Also see Commercial Fisheries Review, May 1958, p. 41.



United States Fishing Fleet<sup>1/</sup> Additions

DECEMBER 1958: A total of 28 vessels of 5 net tons and over were issued first documents as fishing craft in December 1958. Compared with the same month of

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, December 1957 and 1958, and Annual Totals 1955-58

Area	December		Total			
	1958	1957	1958	1957	1956	1955
	(Number)					
New England	1	1	13	19	15	18
Middle Atlantic	-	1	13	23	26	13
Chesapeake	6	5	99	104	138	54
South Atlantic	4	11	135	130	119	65
Gulf	11	23	270	166	100	103
Pacific	5	4	112	102	76	117
Great Lakes	1	1	10	8	6	9
Alaska	-	1	31	48	40	35
Hawaii	-	-	-	-	1	3
Puerto Rico	-	-	-	1	-	-
Virgin Islands	-	-	1	-	-	1
Total	28	47	684	601	521	418

Note: Vessels assigned to the various sections on the basis of their home ports.

<sup>1/</sup>Includes both commercial and sport fishing craft.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, December 1958

Net Tons	Number
5 to 9 . . . . .	11
10 to 19 . . . . .	6
20 to 29 . . . . .	5
30 to 39 . . . . .	4
40 to 49 . . . . .	1
50 to 59 . . . . .	1
Total . . . . .	28

1957, this was a decline of 19 vessels. The major portion of the decline occurred in the Gulf States where only 11 vessels were issued first documents, compared with 23 in December 1957.

YEAR 1958: Fishing craft issued documents as fishing craft during 1958 totaled 684 vessels--an increase of 83 vessels as compared with 1957. Of the vessels documented for fishing, 40 percent were reported from the Gulf States.

Table 3 - U. S. Vessels Issued First Documents as Fishing Craft, 1938-1958

Year	Number
1958 . . . . .	684
1957 . . . . .	601
1956 . . . . .	521
1955 . . . . .	418
1954 . . . . .	717
1953 . . . . .	729
1952 . . . . .	675
1951 . . . . .	780
1950 . . . . .	812
1949 . . . . .	1,002
1948 . . . . .	1,184
1947 . . . . .	1,300
1946 . . . . .	1,085
1945 . . . . .	741
1944 . . . . .	635
1943 . . . . .	358
1942 . . . . .	358
1941 . . . . .	354
1940 . . . . .	320
1939 . . . . .	357
1938 <sup>1/</sup> . . . . .	376

<sup>1/</sup>Data are partly estimated.



## U. S. Foreign Trade

GROUND FISH FILLET IMPORTS, FEBRUARY 1959: Imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets (including blocks) into the United States during February 1959 amounted to 10.3 million pounds--a decline of 8 percent as compared with the same month of last year.

During the first two months of 1959, imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets (including blocks) amounted to 29.3 million pounds--35 percent above the amount reported for the same period of last year. Canada accounted for 44 percent of the total imports during January-February 1959.

The quota of groundfish and ocean perch fillets and blocks permitted to enter the United States at  $1\frac{7}{8}$  cents per pound in the calendar year 1959 is 36,919,874 pounds, based on a quarterly quota of 9,229,968 pounds. The quota for the calendar year 1958 amounted to 35,892,221 pounds. Imports during individual quarters in excess of the established quarterly quota enter at a duty of  $2\frac{1}{2}$  cents a pound.

Note: See Chart 7 in this issue.

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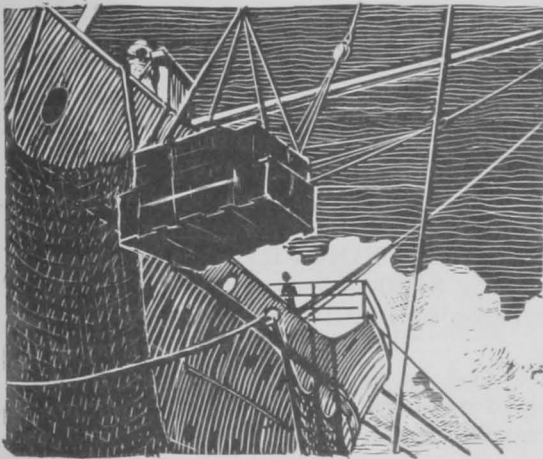
IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, 1958: Summary: The quantity of selected fishery products imported into the United States during 1958 was higher than during 1957. Several products were imported at a record high. Exports of fishery products, as usual, were low compared with imports.

In quantity imported, tuna was again the leading product, followed by groundfish and ocean-perch fillets and blocks, fish meal, shrimp, and salmon. Fresh and frozen tuna imports were 42.1 percent above those of 1957. Canned tuna imports were up 4.1 percent. Other increases were: ground-

fish and ocean-perch fillets and blocks up 15.7 percent; shrimp up 22.5 percent; fresh, frozen, and canned salmon up 38.2 percent; and fish meal up 23.6 percent.

The quantities of the major fishery products exported in 1958 varied considerably from those of 1957. Fish oils, though the leading export, decreased 18.1 percent. Other decreases in exports were: canned mackerel down 86.5 percent and miscellaneous canned fish (mostly canned anchovies) down 89.9 percent. Increases were: fresh or frozen miscellaneous fish, mostly fresh-water species, up 72.6 percent; canned salmon up 38.0 percent; and canned sardines, not in oil, up 19.4 percent.

**Imports: FROZEN TUNA:** The 1958 over-all imports of frozen tuna rose to a record 197,961,000 pounds; 80 percent of these imports were received from Japan. However, imports of frozen albacore were down 20.8 percent from 1957, owing to a poor 1958 fishing season by Japanese fishermen. Instrumental in setting the record imports were receipts of 110,997,000 pounds of other frozen tuna (principally yellowfin) from Japan, 125 percent more than in 1957. The most significant feature in the 1958 tuna trade was the large receipts of tuna caught by the Japanese in the Atlantic and transhipped to the United States through third countries. Although beginning only in September, imports of Japanese-caught Atlantic tuna into California were 3.7 percent of the State's yearly imports of frozen tuna. The amount of Japanese-caught Atlantic tuna imported into Puerto Rico and the U. S. east coast and Gulf ports was believed to be higher than that imported through California. Because of a self-imposed embargo from January to September, the 1958 shipments of tuna loins and discs from Japan fell to 2.8 million pounds, down from 10.6 million pounds in 1957. Imports of loins and discs from other countries increased from about 1.5 million pounds in 1957 to about 2.2 million pounds in 1958.



**CANNED TUNA:** Imports in 1958 consisted primarily of tuna canned in brine. The 1958 quota of 44,693,874 pounds which was designated to be imported at the 12-1/2 percent ad valorem rate of duty was exceeded by about 750,000 pounds. The excess was dutiable at 25 percent ad valorem. Canned tuna in oil, subject to a 35-percent ad valorem duty, was imported in small amounts.

**FRESH AND FROZEN GROUND FISH FILLETS:** Imports of groundfish fillets in 1958 increased as higher receipts of cod and ocean-perch fillets more than offset lower receipts of haddock fillets. Receipts of blocks and slabs of fillets were slightly above those of 1957. Canada, despite a slight decrease in its 1958 shipments, remained the most important supplier of groundfish and ocean perch, sending 71.1 percent of the fillets and 68.1 percent of the blocks import-

ed into the United States. Iceland, with 23.8 percent of the total groundfish fillet imports, almost doubled its 1957 shipments. Among Iceland's shipments were nearly 16 million pounds of frozen blocks of bits and pieces; this was about 10 percent of all fresh or frozen groundfish fillets imported from all sources. By a decision of the Bureau of Customs, blocks of bits and pieces are imported at a rate of 1 cent per pound, under paragraph 720 (b) of the Tariff Act.

**SHRIMP, MOSTLY FROZEN:** The quantity of shrimp imports continued its record-breaking rise. The 1958 receipts were more than double the annual average of the 1950-54 period. Mexico, again the most important supplier, sent 65.7 percent of the total. Panama, Ecuador, and Hong Kong were other important sources.

**CANNED SALMON:** A record high of 29.2 million pounds was imported in 1958. Shipments from Japan, although less than in 1957, were 73.2 percent of the total. Canada sent 7.8 million pounds, or nearly five times more than in 1957.

**CANNED SARDINES:** The decline in imports of canned sardines in oil in 1958 was primarily due to lower Norwegian shipments, which fell to 11 million pounds or about 16 percent less than in 1957. Imports of canned sardines, not in oil, rose as receipts from the Union of South Africa increased to 7.9 million pounds, over two times those of 1957.

**OYSTERS, MOSTLY CANNED:** The record 1958 receipts were nearly nine times the annual average of the 1949-53 period. Japan shipped about 94 percent of the 1958 total.

**FISH MEAL:** Canada, which supplied over half the fish meal imported in 1957, sent only 27.7 percent in 1958. Peru doubled its 1957 shipments and became the main source with 33.3 percent of the total in 1958.

**Exports: CANNED SARDINES NOT IN OIL:** Despite the 19.4-percent increase in quantity over 1957 exports, shipments in 1958 were below expectations. In 1958 the California sardine canning industry had its best pack since 1951. The world market for this product, however, has changed. Sales to some of the former South American markets either were limited by exchange difficulties or were hampered by high tariffs to protect local fisheries. In the Philippine market, which formerly took large quantities of the U. S. product, exporters found strong competition from lower-priced sardines originating in Japan and the Union of South Africa.

**CANNED MACKEREL AND ANCHOVIES:** Lower catches of mackerel and anchovies in 1958 resulted in smaller amounts canned for export.

**CANNED SALMON:** In 1958, United Kingdom restrictions on canned salmon were removed and sales to that country rose to 7.8 million pounds.

**FISH OILS:** For the third successive year, exports of fish oils continued to decline from the record high of 142,286,000 pounds in 1955. These exports have been mainly menhaden oil. Over half the 1958 exports of 94,043,000 pounds was shipped to West Germany and the Netherlands for use in margarine.



## Virginia

**FISHERIES LABORATORY AWARDED GRANT FOR TEACHER TRAINING:** A grant to conduct a research participation program for teacher training this summer was awarded by the National Science Foundation to the Virginia Fisheries Laboratory at Gloucester Point. It is the only marine laboratory in the United States to receive a grant from that Foundation for a course of this nature, according to a March 11 announcement by the Director of the Laboratory.

The purpose of the training program is to stimulate interest in marine biology by giving research experience and instruction to teachers of biology in high schools and small colleges at an active center of marine research. "Teachers who are

aware of career opportunities in marine science and who understand the educational requirements can perform a valuable service to their country by guiding promising candidates into this growing profession," the Laboratory's Director states. Those registered in the course will be required to conduct simple research projects under competent scientists at the Laboratory and will observe methods and techniques of marine research. Furthermore, they will become familiar through lectures, laboratory experiments, and field trips with local salt-water animals and plants.

The Information Officer for the Virginia Laboratory is director of the program and the Head of the Department of Biology and Geology, Texas Christian University, will be the instructor. The course will run from June 22 to July 31.

The grant by the Foundation makes it possible for teachers to further their education and broaden their experiences by giving them up to \$75 a week, plus allowances for travel and dependents. Only 12 teachers can be selected for the program this year because of limited working space at the Laboratory. They will be chosen according to their previous scholastic records, the number of pupils under their supervision, and their services to the teaching profession.



## Washington

### UNIVERSITY OF WASHINGTON AWARDED GRANT FOR FISHERIES RESEARCH:

Two fisheries research grants that will total nearly \$120,000 over a three-year period have been received from the National Institutes of Health by the College of Fisheries at the University of Washington, Seattle.

One project is to study bacterial standards of precooked frozen seafoods under an initial grant of \$28,000 for the first year's work. Grants of \$23,000 will be allocated annually for two subsequent years. The other project, scheduled at \$15,000 annually for three years, is for research on marine bacteria.

In the frozen seafood project, bacterial analyses of the products at various stages of processing and marketing will be made as a safeguard against the possibility of food poisoning.

In the marine bacteria research, a type culture collection of bacteria from marine plants and animals will be established and a logical system for their classification developed. Because marine bacteria thrive in a cold environment, this project may provide important information that could be applied to the storage and preservation of blood, in addition to the significance to fisheries.



## Wholesale Prices, March 1959

Wholesale prices for selected edible fishery products in mid-March 1959 were down 4.1 percent from the preceding month due primarily to lower prices for fresh drawn haddock, and fresh and frozen fillets. As compared to the same month in 1958, the March 1959 edible fish and shellfish (fresh, frozen, and canned) wholesale price index (128.2 percent of the 1947-49 average) was up about 2.7 percent due to higher prices for fresh and frozen drawn and dressed salt-water products, fresh haddock fillets, fresh-water yellow pike, and canned Maine sardines. Fresh and frozen shrimp were lower in March this year as compared with the same month of 1958.



The March 1959 price index for the drawn, dressed, and whole finfish was lower by 10.1 percent from the preceding month because of a sharp drop in drawn fresh haddock prices (down 30.1 percent) and more moderate declines in the wholesale prices for frozen red king salmon, drawn whitefish, and yellow pike. The only increase in wholesale fish

prices from February to March 1959 was a slight rise in frozen halibut prices. As compared with March 1958, the subgroup index for this March was higher by 21.5 percent due to higher prices for all the items in the subgroup except Lake Superior whitefish.

The fresh processed fish and shellfish subgroup index from February to March this year was lower by 3.5 percent due to declines in wholesale prices for fresh haddock fillets (down 21.5 percent), fresh shrimp (down 1.0 percent), and fresh shucked oysters (down 2.1 percent). The subgroup index in March this year when compared with the same month in 1958 was higher by about 1.0 percent. Higher prices for fresh haddock fillets (up 35.7 percent) and oysters (up 4.5 percent) more than offset a drop of 5.2 percent in fresh shrimp prices at New York City.

Due to lower frozen shrimp prices at Chicago and declines of 1-2 cents a pound in prices for the three subgroup frozen

fillet items at Boston, the March 1959 index for frozen processed fish fillets and shellfish declined 2.6 percent from the preceding month. From March 1958 to March this year the wholesale price index fell 5.0 percent because of declines of 8.3 percent in frozen shrimp prices at Chicago and a slight drop (1.3 percent) in the price for frozen haddock fillets at Boston. The other fillet items in this subgroup were unchanged this March from a year ago.

From February to March 1959 the over-all canned fish subgroup index was unchanged. Tuna canning continued at a record pace in March this year; however, the excellent Lenten demand helped to keep packers' inventories at a manageable level. As compared with the same month of 1958, prices for the selected canned fish products this March were lower by 3.0 percent. Higher Maine sardine prices (up 17.8 percent) were offset by 23.6-percent lower California sardine prices and slightly lower prices for canned tuna and salmon.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, March 1959 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <sup>1/</sup> (\$)		Indexes (1947-49=100)				
			Mar. 1959	Feb. 1959	Mar. 1959	Feb. 1959	Jan. 1959	Mar. 1958	
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					128.2	133.7	135.4	124.8	
<b>Fresh &amp; Frozen Fishery Products:</b>					148.8	157.9	160.6	141.1	
<b>Drawn, Dressed, or Whole Finfish:</b>					153.6	170.9	174.1	126.4	
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.15	.21	149.2	212.8	232.9	91.2	
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.33	.33	103.1	102.6	103.7	99.0	
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.75	.77	168.5	173.0	174.1	142.4	
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.67	.77	166.1	190.9	166.1	185.9	
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.80	.80	161.8	161.8	146.6	161.8	
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.73	.74	170.0	173.5	153.6	158.3	
<b>Processed, Fresh (Fish &amp; Shellfish):</b>					145.8	151.1	154.2	144.6	
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.48	.61	161.6	205.9	214.4	119.1	
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.91	.92	143.8	145.3	150.1	151.7	
Oysters, shucked, standards	Norfolk	gal.	5.88	6.00	145.4	148.5	148.5	139.2	
<b>Processed, Frozen (Fish &amp; Shellfish):</b>					133.8	137.4	138.9	140.9	
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.41	.42	106.0	108.6	108.6	106.0	
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.40	.42	124.0	131.8	128.7	125.6	
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.30	.31	118.8	124.9	124.9	118.8	
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.86	.87	132.3	133.8	137.7	144.3	
<b>Canned Fishery Products:</b>					98.8	98.8	98.9	101.8	
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.25	22.25	116.1	116.1	114.8	120.0	
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.00	11.00	79.3	79.3	79.3	82.9	
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.40	7.38	86.9	86.6	91.0	113.8	
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.22	8.22	87.5	87.5	90.1	74.3	

<sup>1/</sup> 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.

