

# TRENDS AND DEVELOPMENTS

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

**MAY 1956:** A total of 53 vessels of 5 net tons and over were issued first documents as fishing craft during May 1956--eleven more than in May 1955, according to the U. S. Bureau of Customs. The Alaska and South Atlantic areas led with 10 each, followed by the Gulf and Pacific areas with 9 each.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft, May 1956 with Comparisons

Section	May		Jan. - May		Total
	1956	1955	1956	1955	
	(Number)				
New England . . .	2	-	8	7	18
Middle Atlantic . .	5	3	13	8	13
Chesapeake . . .	8	4	29	15	54
South Atlantic . . .	10	13	24	28	65
Gulf . . . . .	9	6	38	35	103
Pacific . . . . .	9	13	23	39	117
Great Lakes . . .	-	-	2	2	9
Alaska . . . . .	10	3	22	15	35
Hawaii . . . . .	-	-	1	2	3
Virgin Islands . .	-	-	-	-	1
<b>Total . . . . .</b>	<b>53</b>	<b>42</b>	<b>160</b>	<b>151</b>	<b>418</b>

Note: Vessels have been assigned to the various sections on the basis of registered home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, May 1956

Net Tons	Number
5 to 9 . . . . .	18
10 to 19 . . . . .	18
20 to 29 . . . . .	7
30 to 39 . . . . .	6
40 to 49 . . . . .	1
130 to 139 . . . . .	1
170 to 179 . . . . .	1
180 to 189 . . . . .	1
<b>Total . . . . .</b>	<b>53</b>



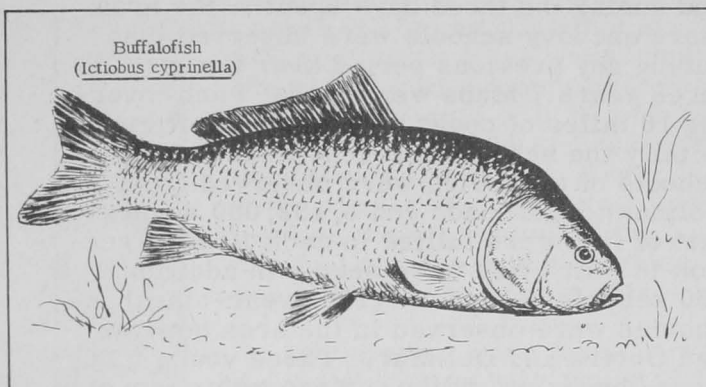
### Arkansas

**FISH AND RICE CROPS:** More and more acres in Arkansas are being used to produce alternating crops of rice and fish. It has been estimated that 50,000 of approximately 1,000,000 acres of the State's rice lands are now being used for commercial fish production.

Reservoirs are an important tool in the production of each of these crops. In the rice-growing areas, the soil structure is such that little or none of the surface water will percolate to the substrata. Thus, to save this valuable water, dirt levees are thrown up to form reservoirs. These are used to flood the fields and to hold fish.

The cycle of rice and fish production is begun with the planting of rice. Water is pumped over the fields of growing rice and then is drawn off just before harvest time. After the rice harvest, the fields are flooded again and this time are planted with the desired fish species, such as carp, buffalofish, and channel catfish. At the end of two years, the fields are drained again and the fish crop is harvested. The marketable fish are sold, brood stock and surplus fish are returned to the reservoirs, and any undesirable species are destroyed.

Though buffalofish and channel catfish are considered difficult to propagate in controlled waters, the job is being done on a hit-or-miss basis. The farmers who have been successful in producing fingerlings of these two species have a most profitable enterprise. It is reported that buffalofish fingerlings, 3 to 6 inches in length, are being sold for \$50 to \$75 a thousand. A rice grower who produced 700 pounds of buffalofish an acre over a two-year period recently sold his marketable fish and a considerable quantity of brood stock for only slightly less than he had received for his previous rice crop. To the price received for the fish could be added, of course, the value of stored water plus fertilizer (fertilizer the water is believed to return to the soil at the rate of approximately \$20 an acre a year).

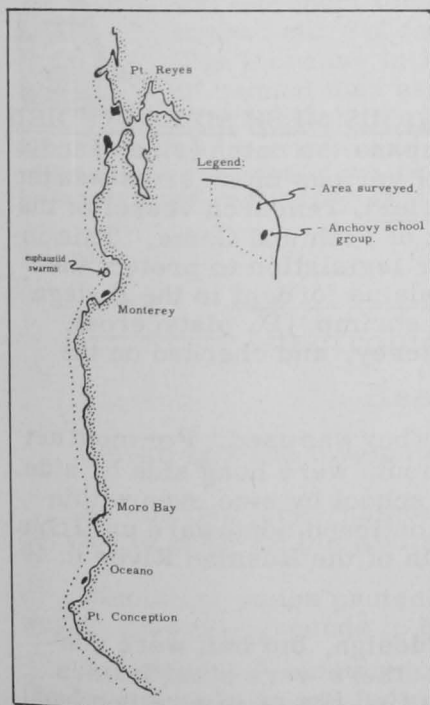


Game species produced by the rice growers are kept for sport fishing. An increasing number of reservoirs are being leased to sportfishing groups or opened to the public on a pay-to-fish basis, reports The Progressive Fish-Culturist (July 1956), a U. S. Fish and Wildlife Service publication.



## California

**PERIODIC FLIGHTS CONTINUED TO STUDY PELAGIC FISH DISTRIBUTION (Airplane Spotting Flight 56-4):** The fourth of a series of periodic flights designed to study pelagic fish distribution, abundance, and behavior in 1956 was completed by the California Department of Fish and Game (Cessna "170" 1359D during May 7-11, 1956. The inshore area from Pt. Reyes to San Diego was surveyed.

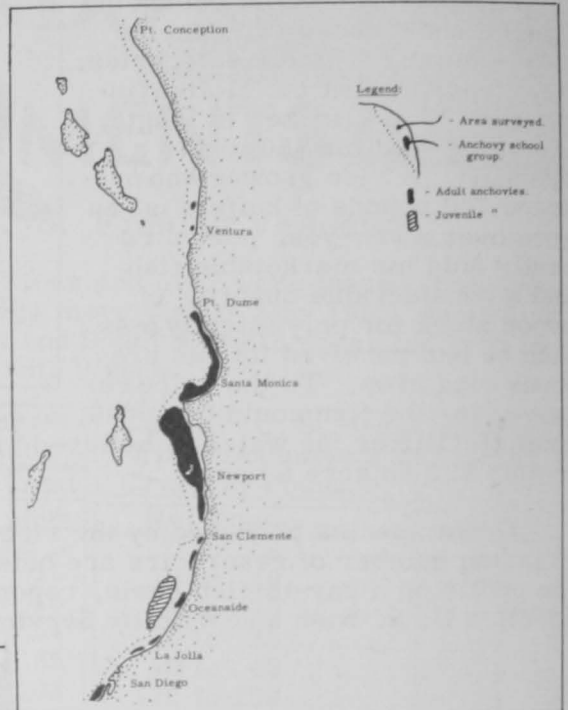


Despite the occurrence of rain showers on May 8 and 9, an excellent coverage of the coast was made. Visibility was good and exceptionally calm weather prevailed over the entire coast.

Plankton concentrations changed considerably since the April 2-6 flight. The large areas of rich "brown" water were replaced with clearer "green" water and visibility into the water was very good. Brown water was found only in small areas in Monterey and Drakes Bays. Euphausiid swarms were present in Monterey Bay again as in April and the salmon boats, both commercial and sport, were concentrated in the area where the euphausiids were concentrated. On May 7, 59 boats, and on May 8, 135 boats were observed in the area of euphausiid swarming which extended about two miles in diameter.

Most of the fish schools observed during this flight were very close to the surface, thus permitting good identification from the air. A check with the commercial and sport boats revealed a comparable fish distribution and identification as was made from the air.

**Anchovy:** Anchovy schools dominated the inshore area over the entire extent of the coast covered. Adult anchovy schools were very numerous south of Pt. Dume and during the three days spent in the area more anchovy schools were observed than during any previous period over the last three years. Maps were made, each covering 10 miles of coast line, to more efficiently tally the schools seen. A total of 3,039 schools of anchovies were observed from Bolinas to Coronado and 8,132,000 square feet of fish were tallied in each 10-mile section in which fish were seen. In addition, 550 schools of juvenile (1956 year-class) anchovies were observed in the area between San Onofre and Del Mar. These young fish were "breezing" on the surface in thin schools averaging about 3,000 sq. ft. per school. No adult fish of any species was observed near these young fish and no sea lions or birds were observed in the area feeding on the fish.



Airplane Spotting Flight 56-4 (May 8, 10, and 11, 1956.

**Sardine and Mackerel:** No schools of sardine and mackerel were observed in the inshore area covered. Routine sampling of the commercial and bait anchovy catch revealed the presence of a trace of "eight-inch" sardines mixed in with most schools of anchovies taken. Commercial fishermen reported catches of jack mackerel at San Clemente and Santa Catalina Islands and also reported some schools of adult sardines in these areas. A sample of adult sardines taken at Santa Catalina Island revealed that the fish were in near spawning condition. In comparison with last year, the adult sardines are remaining closer to the shore during the 1956 spawning period. It was not until the first week of June that adult sardines were seen along the coast in the spring of 1955.

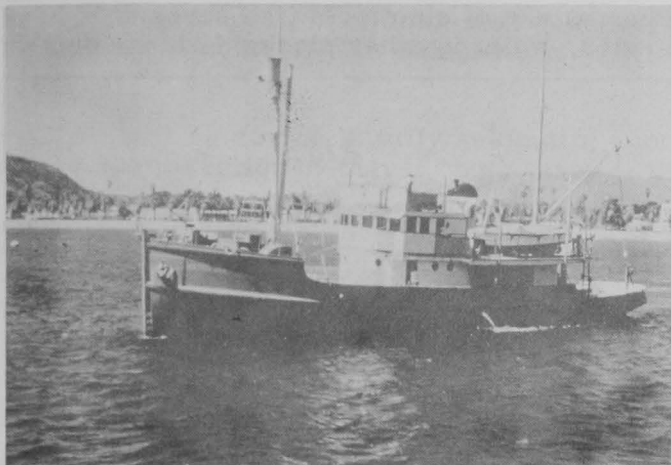
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**CATCH OF SHRIMP BEAM TRAWL NETS OF VARIOUS MESH SIZES STUDIED BY M/V "N. B. SCOFIELD" (Cruise 56-B-1):** To compare the catch (size of individuals and total quantity) of shrimp beam trawl nets of various mesh sizes was the principal purpose of this cruise by the M/V N. B. Scofield, research vessel of the Marine Fisheries Branch of the California Department of Fish and Game. This information is to be used in making recommendations for legislation to protect the necessary numbers of spawners. Fishing was for *Pandalus jordani* in the Bodega Bay area. In addition, the vessel attempted to collect shrimp, (*P. platyceros*), with two types of experimental traps just south of Monterey, and checked on the abundance of abalones on the Farallone Islands.

A beam trawl frame 20' across with a single crossbar was used. For most net comparisons two trawl nets, each 10 feet across the mouth were hung side by side. This method cancels out the tendency of the shrimp to school by size even within the same bed. Scouting was begun off Pt. Reyes and continued northward until commercial-size catches were made just south of the mouth of the Russian River in 40 fathoms.

The experimental shrimp traps were of one basic design, but half were constructed of heavy "hardware cloth" steel mesh and the others were steel frames covered with cotton net webbing; the only bait used was fish livers in a rather bad state of decomposition.

A total of 100 drags were made with the beam trawl. Of this number 65 had enough shrimp in each net to constitute adequate samples for comparison. One 25-minute drag produced 1,200 pounds of shrimp. Nets of six different mesh sizes were used. These covered the spread from a mesh minimum of 0.69 inch to a maximum of 1.84 inches measured inside the knots. Exact evaluation of the results will depend on the measuring of the individual shrimp in the samples and organization of this data.



N. B. Scofield.

No prawns were taken in the 4 days of fishing with traps. The probable cause was improper bait. Lampreys were taken at an average of about nine per trap per setting.

The abalone exploration at the Farallone Islands was limited to one morning. Abalone are normally found in quantity only on the rougher shores, i.e. they would be expected only on the windward side of the islands. The swell was heavy enough to make it impossible to get in close enough to dive, let alone to do any actual diving. Instead dives were made in three places in the lea of the islands. Abalone were quite scarce, as was expected.



## Cans--Shipments for Fishery Products, January-April 1956



Total shipments of metal cans during January-April amounted to 39,330 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 23,881 tons in January-April 1955. The increase in January-April 1956 probably reflects the heavier pack of canned tuna as compared with the January-April 1955 period. Packs of other fishery products are usually light during this period of the year.

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.



## Electronic Devices Utilized in Fishery Research and Management

Unwittingly and involuntarily the fish has "gone electric."

An electric fence has been used successfully by the U. S. Fish and Wildlife Service to keep the big Kodiak bear away from critical sections of salmon streams.

Electrical weirs protect fish by jolting the life out of sea lampreys on their way to spawning grounds to bring forth more lampreys to prey on more fish.

A "tattletale" electronic device, called a sonic tracker, is being attached to the back of salmon and for as much as 100 hours every twist and turn of the fish is flashed to a recording instrument on land or in a boat.



Fish count themselves when passing through another device created by the Fish and Wildlife Service and at times the fish take their own pictures.

Fish protection at powerplant intakes by use of electrical fish screens is being studied by the Fish and Wildlife Service, while in other places fish are being spotted for harvesting by any one of several fish finders which have been developed by electronic specialists.

An underwater telemeter which indicates the depth of nets has solved one of the problems of midwater trawling. Underwater television is telling the Fish and Wildlife Service more about fish in their regular habitat and more about what could be done to make fishing gear more efficient and effective.

Fish "shockers" are used to temporarily "knock out" fish in a stream to permit stream population counts.



Besides these, there are the fathometers used to measure ocean depths, radar and electrical beams and direction finders to guide ships and planes, and radio for communications.

All of these devices the Fish and Wildlife Service uses--some, like the fish counter, the Fish and Wildlife Service created; some, like the sonic tracker and underwater telemeter, electronic specialists created at the behest of the Fish and Wildlife Service; others, such as the fish finders and the underwater television, other sources created and developed and the Fish and Wildlife Service adapted for it use.

Three of these devices--the electric fish counter, the sonic tracker, and the fish-guiding apparatus--apply particularly to salmon studies but can be used on other species of fish as well. In fact, considerable interest has been shown in the fish counter and in the guiding device by many state fish and game departments. The sonic tracker is too new to elicit widespread comment yet.

The sonic tracker is to be used to study the passage of fish through fishways. The initial studies will be made at Bonneville Dam on the Columbia River where the Service has the facilities to observe fish behavior in several types of fishways. By being able to chart the reactions of salmon to various types of fishways, Service technicians hope to be able to determine the most effective fish-ladder design.

The sonic tracker is a capsule about 2.5 inches long and less than an inch in diameter which is fastened to the back of a salmon just to the rear of the dorsal fin. Studies show that the fish's reactions are normal about five seconds after the tracker is attached. It contains a 15-volt battery and other transmitting apparatus capable of sending signals for a period of time varying from 10 hours to 100 hours. The signals can be detected as far as 2,000 feet under ideal conditions. A fish carrying the capsule can be tracked and its position pinpointed for about 800 feet in clear still water and for about 100 feet in rough, turbulent streams. The receiver which automatically registers the movements can be placed on shore or installed in a boat. Sound waves may be varied so that movements of as many as ten fish can be traced at the same time.

The chief value of the electric fish counter at present is to test the effectiveness of the fishways as well as to register the number of salmon heading for the spawning grounds. The continuance of a salmon fishery depends to a great extent upon a sufficient number of adult fish reaching the spawning area. The practice of making visual counts at fish ladders and in streams has not been entirely satisfactory.

The counting device is fully automatic, not only counting the fish and indicating the size and direction of travel, but, through the medium of an underwater camera, it can identify the species of fish. The counter can also be adjusted merely to sound a signal when a fish goes past, thus alerting a watcher to his task. It is also possible to have the dial, which registers the fish, installed in an office or at some other point some distance from the stream. Indications are that this instrument, when fully developed, will be used in many parts of the Nation where fish runs are important and in many places where fish counts are needed.

Numerous techniques in screening young fish from water diversions have been tried with varying degrees of success. Since the power turbine and some of the big irrigation diversions offer a major threat to young fish, especially salmon on their way back to the sea, the Fish and Wildlife Service has done considerable research on mechanical and electrical methods of meeting the problem. Considerably more research is necessary along this line.

In small experimental streams these devices have been about 95 percent successful in guiding the fish into the desired places. Testing is now being done on large streams. Two methods have been used, one based on the fact that fish are attracted to the positive pole. The other is based upon the principal of repulsion of fish by an electrical field.

The sea lamprey weir is an electrical barrier placed across a stream used by the lamprey for spawning. The weir is an apparatus of charged electrodes which sets up an electrical field which kills any sea lamprey attempting to pass through it. The weirs are installed in streams tributary to the Great Lakes in cooperation with the respective state fish and game departments. The sea lamprey which entered the upper Great Lakes about 20 years ago has destroyed the lake trout fishery of Lake Michigan and Lake Huron and has now appeared in Lake Superior. Its control is a major objective of the Service and allied agencies.

The underwater telemeter is a device which indicates the exact distance of the trawl or net below the surface of the water. Its use will aid considerably in increasing the efficiency of midwater ocean commercial fishing, especially the exploratory work which will be necessary to determine the fishery values of the midwater area. Comparatively little midwater fishing has been done by United States fishermen, who have concentrated on surface and bottom fishing.

The Fish and Wildlife Service has two underwater television units. One of these is at the Gear Research Laboratory at Coral Gables, Fla., and the other is at the Fishery Laboratory at Woods Hole, Mass. At Coral Gables, the television has permitted close scrutiny of fishing gear in actual operation under water. It is expected that this research will result in many improvements in the efficiency of commercial fishing gear. At Woods Hole, biologists are more concerned with the effect of fishing gear upon fish which are too small for market. The sizes of fish which will escape through the meshes of trawls will be studied, as well as the manner of escape and behavior within the net, so as to determine methods of saving small fish from destruction. Biologists will also make various studies of the ocean bottom and the small marine animals which inhabit the bottom and serve as fish food.

In order that underwater television might be better utilized, the researchers at Coral Gables have developed an electrically-controlled vehicle which permits the manipulation of the camera under water.

The use of the electric shocker in making fish population studies has been an accepted practice for years, but recent adaptations made by the State of New York under a Federal-aid project now makes the shocker effective in soft water, thereby extending its usefulness into many areas.

The electric fence protects the spawning salmon from the bears. Generally speaking Kodiak bears can go any place they desire to go but a few brushes with the fence had a very salutatory effect upon the big fellows. This experiment has been in operation for about three years.

Thus electricity and electronics play a major role in the life of fish, protecting them from harm until such time as they become useful to man, at which time it swings against the fish and over to man, as attested by such devices as fish finders and the electric range.



### Federal Purchases of Fishery Products

**FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE, MAY 1956:** The Army Quartermaster Corps in May 1956 purchased 2,715 pounds (valued at \$1,322,000) of fresh and frozen fishery products for the use of the U. S. Army, Navy, Marine Corps, and Air Force. This was 48 percent more in quantity and 58.9 percent more in value than purchases the previous month and 26.9 percent more in quantity and 43.4 percent more in value than purchases in May 1955.

Purchases of fresh and frozen fishery products during the first five months of 1956 totaled 9,494,000 pounds (valued at \$4,855,000)--12.3 percent less in quantity but 4.6 percent more in value than purchases for the same period a year earlier. This indicates that

this year the purchases consisted of higher-priced products.

Purchases of Fresh and Frozen Fishery Products by Department of Defense (May and the First Five Months of 1956 with Comparisons)							
QUANTITY				VALUE			
May		Jan. - May		May		Jan. - May	
1956	1955	1956	1955	1956	1955	1956	1955
. . . (1,000 Pounds) . . .				. . . . (\$1,000) . . . .			
2,715	2,139	9,494	10,825	1,322	921	4,855	4,639

Prices paid for these fishery products by the Department of Defense in May averaged 48.7 cents a pound as compared with 45.3 cents

a pound the previous month and 43.1 cents a pound in May 1955.

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

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#### QUARTERMASTER CANNED SALMON REQUIREMENTS FROM 1956 PACK:

Tentative requirements for a group of canned food items from the 1956 pack to meet the needs of the Armed Forces were announced June 28 by the Department of Defense. Included in the requirements are 5,201,000 pounds of coho or medium red



salmon packed in No. 1 tall cans. These estimated requirements are subject to modification and are listed to aid industry in planning 1956 production. Procurement will be effected by the various Market Center offices of the Army Quartermaster Market Center System, with headquarters at 226 West Jackson Blvd., Chicago 9, Ill.



## Films

**FISHERY FILMS SELECTED FOR INTERNATIONAL FILM FESTIVAL:** Four new documentary motion pictures produced by Interior Department agencies in cooperation with private industry are among the eight United States Government films selected for showing at the 1956 Film Festival in Edinburgh, Scotland, in August and September, Secretary of the Interior Fred A. Seaton announced June 29. The film festival is part of the International Festival of Music and Drama in which about 25 nations participate annually.

Two of the chosen entries were produced under the supervision of the Fish and Wildlife Service, and two under the Bureau of Mines. This is the second time this honor has been won by the Fish and Wildlife Service.

Boats, blue water, and seafood fit for a king but within reach of all are featured in the Fish and Wildlife Service pictures. The films, all in 16mm. color and sound, and the names of the private industry sponsors are:



Maine lobsterman. A scene in the film Outboard Fisherman U.S.A.

Outboard Fisherman U.S.A., financed by the Outboard, Marine and Manufacturing Company of Milwaukee, Wis., makers of outboard motors. It shows how the rugged, small, independent commercial fisherman, using outboard motors, contributes to the national economy. Scenes from 10 areas in the United States and Alaska show the catching of 10 different species of fish and shellfish using various colorful fishing techniques.

Shrimp Tips from New Orleans, financed by The Peelers Company of that cosmopolitan city, manufacturers of shrimp processing equipment. The film reflects, in its unusual style of cooking, music, and architecture, the people from many countries who settled there. Six shrimp recipes are cooked and served in typical New Orleans atmosphere showing the influence of various countries upon New Orleans culture.

The other two Interior Department films selected are The Petrified River--The Story of Uranium and Arizona and its Natural Resources.





A scene in the film Shrimp Tips from New Orleans.

These films may be secured on a loan basis without charge, although only one, Arizona and its Natural Resources, is available at the present time. The other three will probably be ready for distribution before September.

Each year the United States sends Government and non-Government films to the Edinburgh Festival. The American Government films are selected by the Interdepartmental Committee on Visual and Auditory Materials for Distribution Abroad. This committee, in turn, works through subgroups, one of which is the Subcommittee on Motion Pictures.

The Committee is now considering the selection of exhibits to the International Exhibition of Cinematographic Art which will be held in Venice, Italy, after the Edinburgh Festival.



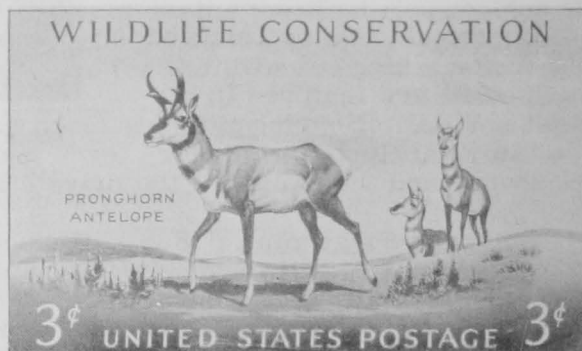
## Fish and Wildlife Motif on United States Postage Stamps

The second (pronghorn antelope) of the three stamps being issued to emphasize the importance of Wildlife Conservation in America was released at Gunnison, Colo., on June 22, 1956, the Post Office Department announced on April 23. This special 3-cent stamp was first placed on sale on the occasion of the annual convention of the Colorado Division of the Izaak Walton League. The first (wild turkey) stamp in this series was issued at Fond du Lac, Wis., on May 5, 1956.

The pronghorn antelope, which is the subject of this issue, is an outstanding example of the conservation work being carried on by the Federal and State Governments. Antelopes have been protected, studied, and transplanted under scientific guidance so that their numbers have increased from a low of 17,000 to herds large enough to allow hunting in five Western States.

The stamp is 0.84 by 1.44 inches in dimension, arranged horizontally with a single outline frame, printed by the rotary process, electric-eye perforated, and issued in sheets of 50.

Note: Also see Commercial Fisheries Review, April 1956, p. 13.



The design of this stamp portrays a buck and two does of the pronghorn antelope species in their natural habitat.



## Fish and Wildlife Service

**NEW RESEARCH LABORATORY TO STUDY PROBLEMS OF GULF FISHERIES:** Problems related to finding, catching, and processing Gulf of Mexico fish and shellfish will be tackled at the new U. S. Fish and Wildlife Service fishery laboratory to be constructed this year at Pascagoula, Miss., Secretary of the Interior Fred A. Seaton announced July 18.

Contract for the construction of the new laboratory and auxiliary buildings has been awarded to the Oden Construction Company of Hattiesburg, Miss., for \$165,000. Engineers of the Service's Regional Office in Atlanta, Ga., will exercise general supervision of construction. In addition to the fisheries research building, there will be a net facility and a smaller structure to be used for fishing gear fabrication.

Research on methods and techniques for providing the highest quality pack of shrimp, oysters, tuna, and other south Atlantic and Gulf seafoods will be one of the main tasks of the new laboratory. Heretofore technological work for the Gulf and south Atlantic areas was handled through the Service's laboratory at College Park, Md.

The new installation will provide facilities for the exploratory fishing and gear development program now being conducted in the Gulf area. The Service's exploratory fishing vessel Oregon, which operates in the Gulf of Mexico, is based at Pascagoula in connection with this program.

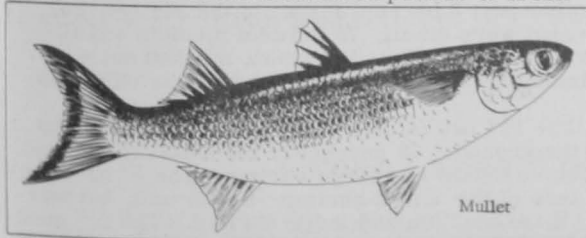
Office space also will be furnished in the new laboratory for local personnel engaged in statistical work and the educational and market development programs.



### Florida

**FISHERIES RESEARCH, JANUARY-MARCH 1956:** The following are some excerpts from the Quarterly Report on Fisheries Research, March 1956, of The Marine Laboratory of the University of Miami.

**Mullet Marketing Study:** As part of the program to expand demand for mullet, an experimental smokehouse was built. Inquiries were made on the possibility of creating a market for mullet in Milwaukee for smoking. Locally-smoked mullet were taken to Milwaukee to demonstrate the quality of the product and several hundred pounds of fresh



and frozen mullet were shipped to Milwaukee and smoked there by a large commercial smoker. The smoked mullet were introduced through the regular channels of distribution. Use of mullet for this purpose will depend on solving problems of price and low yield after cleaning.

Questionnaires were mailed to several hundred institutions in the southeastern United States to determine their buying habits. An analysis of their

answers will be presented to dealers so they can better cultivate this market for Florida seafoods and increase demand for their products.

**Shrimp Technology: BLACK SPOT:** (1) Further experiments were carried out to determine the degree of thiamine destruction and amount of residual  $SO_2$  in shrimp treated with sodium bisulphite at levels which offer adequate protection against black spot. Two series of tests consisting of a total of 36 analyses showed no significant differences in the amount of thiamine between the bisulphite-treated and control shrimp samples. The  $SO_2$  residual was from 22 to 65 times lower than in dried fruit of well known brands. A high degree of thiamine destruction and high amounts of residual  $SO_2$  were the major objections to the use of bisulphite in shrimp that were anticipated from the U. S. Food and Drug Administration. Now that these potential objections have been removed, the way is paved for an application for the necessary approval from the Food and Drug Administration for the use of bisulphite in shrimp. The necessary brief has been prepared.

(2) Frozen shrimp obtained from a wholesale source were thawed and then stored in flake ice containing 0.1 percent sodium bisulphite. This

preliminary experiment indicated that the rate of black spot formation can be reduced using the bisulphite flake ice. Further experiments are to be carried out.

(3) Field trials were conducted with butylated hydroxy toluene antioxidant ice in Tampa. Fifty tons of this ice were prepared. Due to an unforeseen delay in the departure of the fishing vessel, the ice had to be stored for about one week at 10° F. As a result, it was supercooled upon loading aboard the vessel. The greatly reduced chilling and bathing effect due to the lower melting rate of the ice caused a high amount of black spot and spoilage. It is planned to repeat the test.

**ANTIBIOTIC ICES:** The degree of uniformity in which aureomycin is distributed in the ice was studied. Twenty-eight analyses were run on aureomycin ices in which seven different combinations of carrying agents were used. Carrageen was superior to high viscosity carboxymethylcellulose and to methylcellulose. The main objection to the use of the carrageen (SeaKem 9) carrier is that it contains calcium ions which catalyze the black spot reactions.

**SPOILAGE DETERMINATION TESTS:** Chromatographic analyses of the amino acids in shrimp were started. The object of this study is to determine whether and what type of relationship exists between the degree of spoilage of shrimp and the quality and quantity of certain amino acids present. It is hoped to use such a relationship as an indicator of recipient spoilage in shrimp.

**SMALL SHRIMP STUDIES:** It has been stated that "size of mesh does not control to any marked degree the size of shrimp caught." This is not true, as experimentation in North Carolina and now by ourselves has shown.

Tortugas experiments: objectives: (1) to get data on seasonal changes in average size of shrimp on the fishing grounds; (2) to get data on area differences in average size of shrimp on the fishing grounds; (3) to find average size of shrimp retained and escaping through cod ends of various mesh sizes; (4) to standardize mesh-measuring techniques and determine shrinkage characteristics of cod ends; (5) to relate length data to commercial "count" (weight) categories.

Procedures: boat: Manboy out of Key West, 110' single-screw; 170 hp. engine. Cruises 8.5 knots, fishes 3 knots (9' x 3'4" boards).

Objective is not to see how many shrimp can be caught, but only to see what sizes are caught. Also, to compare what goes through the cod end meshes with what is retained in the cod end.

Fishing is done on two successive nights during the first two weeks of each month. Three hauls are made each night of two hours duration, covering about 6½ nautical miles each. The first three hauls are made due west from a point about 4 miles north and 8½ miles west of the Wreck Buoy. The second three hauls are made to the east, parallel to the first series, starting at the easterly end of

the area trawled the first night and 4 miles south of it. The area includes a depth range of from 13 fathoms to 17 fathoms.

The net is a 100' Florida flat trawl. The cover is untarred cotton of 1" stretched mesh when new and dry (less due to shrinkage). It is attached about 12 meshes below the beginning of the cod end. It trails about 4-5 feet past the end of the cod end.

The net is fished exactly as a commercial net would be. When the net comes aboard the cover net is opened and its catch is put aside. Then the cod end is opened. Estimates are made (1) of the weight of the total (shrimp and trash); (2) of the trash; (3) shrimp; (4) finfish, shell and sponge. Note is made of the proportion of shrimp still alive in the cover bag.

A known proportion of the total catch is then separated. The shrimp are separated from the trash, headed, and the heads preserved for measurement. The rest of the catch is headed and sold.

At the conclusion of each haul, surface and bottom salinities and surface and bottom temperatures are recorded. Certain weather data are recorded.

The shrimp are measured by taking the length of the cephalothorax (head) between the notch in the eye socket and the far end of cephalothorax. These were converted to count sizes by actual observations.

Meshes were measured on the nets used. Considerable shrinkage occurs after soaking, reducing the average mesh size 10-20 percent.

Three cod ends with mesh sizes of 1¾", 2", and 2½", but otherwise identical to gear used commercially, were used. The 2½" is not in commercial use.

The different size meshes caught different sizes of shrimp. The data obtained shows the percentages of various sizes of shrimp caught by the 3 mesh sizes, comparing 70 count and smaller shrimp, 31-60 count, and 30 count and larger shrimp. They show that 43 percent of the shrimp caught in the 1¾" mesh net were smaller shrimp (less than 70 count), 48 percent were medium size (31-60 count), and 9 percent were large shrimp (over 30 count). In the 2" net, 38 percent were small, 54 percent medium and 8 percent large; in the 2½" net, 16 percent were small, 75 percent medium and 10 percent large. Thus the small-meshed net was catching more smaller shrimp than the other two.

The 1¾" net catches practically all the shrimp on the grounds; 98 percent of the small shrimp and all the medium and large shrimp. The 2" net catches less of the small shrimp--91 percent, but nearly all the medium and large shrimp. The 2½" mesh caught slightly less than half (49 percent) of the small shrimp, 77 percent of the medium, and nearly all of the large shrimp.

Hence the ability of nets of different sizes to catch shrimp of different sizes is unquestionable.



## Great Lakes

**ELECTRICAL WEIRS TO CONTROL SEA LAMPREYS MUST REMAIN IN OPERATION EIGHT YEARS:** The Great Lakes sea-lamprey control program discovered recently that electrical weirs now in operation on major streams must remain in operation at least 7 to 8 years and possibly longer to be effective.

Sea lampreys stay in the Great Lakes as fish-killing adults at least one year, then migrate up inland streams and lay their eggs in gravel beds. The eggs hatch soon after and the young spend their larval stage in mudbanks.

Formerly, it was thought this larval stage lasted four years before the young moved downstream for their rampaging period of Great Lakes fish destruction.

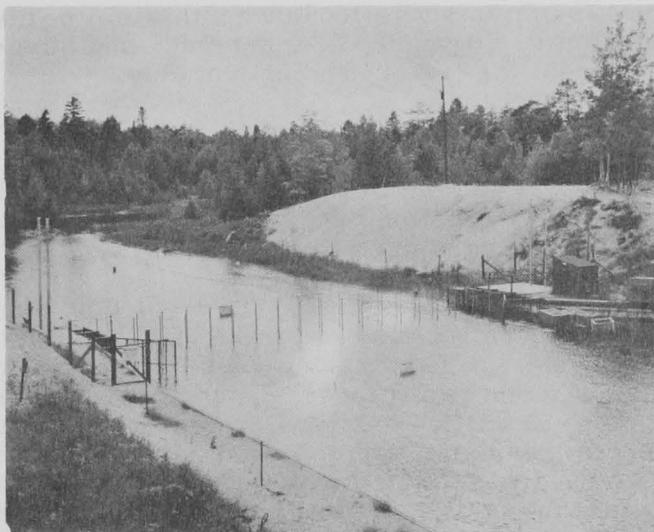
But continuing research by the U. S. Fish and Wildlife Service and the Michigan Conservation Department's institute for fisheries research first showed this larval stage to be not 4 years, but 5 years, then at least 6, now "at least 7 to 8 years and possibly longer."

In short, it means that electrical weirs now in some streams must be in operation at least this length of time to halt all possible spawning lampreys and put an effective check on the predator.

Such complete control through use of weirs, fisheries workers admit, may be very difficult, even impossible.

The information places new emphasis on the only other presently-known method of control-- use of chemicals to kill larvae lying in upstream mudbanks.

Two chemicals are known to kill the young larvae without damage to fish life. These chemicals recently were discovered at the Fish and Wildlife Service research station near Rogers City, but both presently are unavailable in commercial quantities and production would be costly, a Michigan Department of Conservation news bulletin points out.



Electrical control device of the 2-line suspension type. This device was installed by the Fish and Wildlife Service on the Ocqueoc River, a tributary to Lake Huron. Traps for fishes and sea lampreys are located on either bank of the stream.



## Great Lakes Fishery Investigations

**FISHERY STUDY OF SAGINAW BAY INITIATED BY M/V "CISCO" (Cruise 1):** This cruise (June 3-11) of the Cisco initiates an intensive hydrographic and fishery study of Saginaw Bay that will be continued until late November 1956. Primary objectives of the study are to determine the composition and condition of fish stocks in the Bay and to establish the physical, chemical, and biological factors that may influence or regulate these populations.

One hydrographic transect was made between Harbor Beach and East Tawas extending "dog-leg" fashion out into Lake Huron. A second transect was made from



East Tawas to Bay City. Complete hydrographic data (plankton, light penetration, Nansen-bottle cast, and vertical temperatures) were obtained at three points on the first transect and at two locations on the second. A thermal profile of each transect was obtained from bathythermograph casts made at 5-mile intervals, and from a continuous record of surface temperature. Drift bottles were released at regular intervals along each transect to explore water movements in and near the Bay. These transects will be run and similar data collected during each cruise this year. Detailed descriptions of the operations will not be made in subsequent cruise reports.

The vertical distribution of fish in deeper water at the northeast end of Saginaw Bay (off East Tawas) was explored by fishing gill nets set obliquely from the surface to the bottom. The catch in nets set in 13 fathoms indicated a fair concentration of large bloaters (Leucichthys hoyi) near the bottom, and a scattering of yellow perch (Perca flavescens) and smelt (Osmerus mordax) at midlevels. The catch was extremely light at 26 fathoms. Only one lake herring (Leucichthys artedi), two bloaters, and two smelt were taken. Nets will be fished at these locations throughout this summer and fall to learn if this may be the area occupied by the walleye (Stizostedion v. vitreum), lake herring, and smelt during the period when they "disappear" from the fishery in Saginaw Bay.

The temperature of Lake Huron was low with a minimum recorded surface temperature of 4.3° C. (37.7° F.). Thermal stratification in the open lake was slight to absent. In Saginaw Bay stratification was more pronounced but the epilimnion extended to the bottom except in the deepest basins. Surface water temperatures in the Bay were high, with the highest temperature (24° C., 75.2° F.) recorded in the shallow southwest end.

A cooperative study with the Michigan Institute for Fisheries Research was begun on June 7. Two Service vessels, the Cisco and the Musky, and a Michigan patrol boat made two transects each across different sections of Saginaw Bay, taking a total of 51 bottom samples, releasing 350 drift bottles, and taking many water samples, plankton samples, and surface and subsurface water temperature readings. Several bottom cores were also obtained. The transects were spaced so that a reasonably accurate picture of Saginaw Bay bottom fauna, bottom types, water chemistry, and temperatures and currents could be obtained. Similar transects will be run again in midsummer and in the fall. It is hoped that the data might reveal some reasons for the striking changes in fish composition which have taken place in Saginaw Bay in recent years.

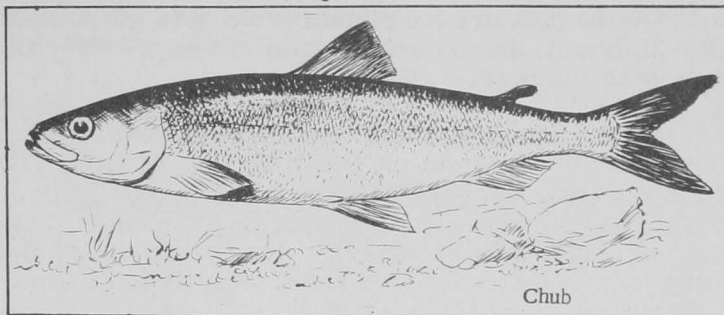
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#### CHUB POPULATIONS IN LAKE HURON STUDIED BY M/V "CISCO" (Cruise 2):

In order to determine the composition and condition of the chub populations, the Service research vessel Cisco extended this cruise (June 19-July 2, 1956) from Saginaw Bay into Lake Huron. Commercial exploitation of the chubs in Lake Huron has been resumed during the past two years. This fishery has become increasingly important with the decrease in size and quality of chubs from Lake Michigan.

Nylon gill nets (2 $\frac{1}{4}$ -, 2 $\frac{1}{2}$ -, 2 $\frac{3}{4}$ -, 3-, and 4-inch mesh) were set on the bottom in 25 fathoms off Harbor Beach and in 50 fathoms in midlake between Harbor Beach and Goderich to sample the chub population. The shallow set contained practically all bloaters (Leucichthys hoyi). The deeper nets made a good catch of large longjaws (L. alpenae) and also took several L. kiyi, L. zenithicus, and L. reighardi. The catch of L. reighardi was especially interesting since this species has not been recorded previously from Lake Huron. Preliminary comparisons indicate that these chubs are consistently larger than those taken in the same nets during Cisco operations in Lake Michigan.

Oblique gill-net sets in 13 and 26 fathoms off East Tawas were repeated during this cruise to establish the vertical distribution of fish at the lakeward end of Saginaw Bay. Only one fish (a bloater) was taken in the deeper set. There were a few bloaters scattered throughout the shallow set, except near the surface. A bull net (300' long, 120 meshes deep, 2½-inch mesh) was set over a 13-fathom bottom with the float line 6 feet beneath the surface. This net took 11 alewives (Pomolobus pseudoharengus), 2 yellow perch (Perca flavescens), and 1 smelt (Osmerus mordax).



Trawling was attempted in 8, 6, 4, and 2½ fathoms for the first time in Saginaw Bay, but much difficulty was encountered in locating good bottom for this work. The catches were entirely yellow perch and forage fish.

Hydrographic transects from Bay City to East Tawas, East Tawas to Harbor Beach, Harbor Beach to Goderich, East Tawas to Oak Point, and Hat Point were completed this cruise. Standard operations completed on transects were described in the report of cruise 1.

Surface water temperatures ranged from 7.0° C. (44.6° F.) to 23.1° C. (73.6° F.). The water is thermally stratified in all but the very shallowest areas of Saginaw Bay.

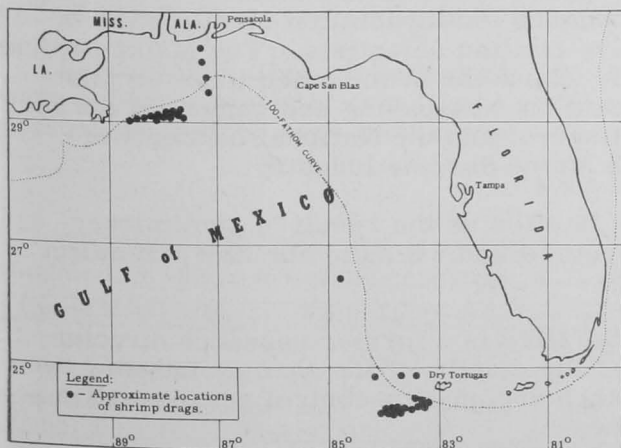
A night study on vertical migration of Mysis relicta, an important fish-food organism, was made in 25 fathoms off East Tawas. Some Mysis reached the surface about two hours after sunset, but many of them appeared to descend shortly thereafter, probably influenced by a bright moon.



## Gulf Exploratory Fishery Program

### DEEP-WATER RED SHRIMP COMMERCIAL POTENTIAL BEING EXPLORED

M/V "OREGON" (Cruise 39): A total of seven days of round-the-clock fishing yielded a catch of approximately 2,700 pounds of red shrimp (heads off) that averaged 26-30 count, the Service's exploratory fishing vessel Oregon reported on its return to Pascagoula on June 26. The vessel returned from a two-week cruise to the southeastern and northeastern Gulf. The principal objectives of the trip were to obtain information on the commercial production potential of deep-water red shrimp (Hymenopenaeus robustus) in two areas of promise discovered during previous Oregon fishing, and to obtain iced and frozen samples of red shrimp for technological studies. The fishing on this trip was carried out with 80-foot balloon and 100-foot flat trawls. Individual drags were of 2- to 4-hour duration.



M/V Oregon Cruise 39 continued to explore deep-water red shrimp potential in the Gulf.

Highest catch rates were obtained west-southwest of Dry Tortugas in depths

of 210 to 220 fathoms. Catches ranged from 50 to 490 pounds and averaged 225 pounds of heads-on shrimp per drag. Three days of fishing between 83°06' W. and 83°35' W. caught a total of 3,145 pounds of heads-on red shrimp. In addition, catches in this area included from 1 to 45 pounds of an unidentified species of large (21-25 count, heads on) striped shrimp. Only one of the 15 drags resulted in serious gear damage.

Four days of fishing operations were conducted in depths of 200 to 250 fathoms between the Mississippi Delta and off Mobile. One day of test dragging was needed to locate optimum fishing depths (240-250 fathoms). The 14 successful drags made during the next three days caught from 61 to 224 pounds of heads-on red shrimp, and averaged 130 pounds per drag. A total of 2,055 pounds of heads-on shrimp were caught in this area. One trawl was damaged due to bogging.

Three drags were made southwest of Tampa in 210 to 215 fathoms. Six pounds of red shrimp were taken in one of the hauls. One of the trawls was lost.

*Penaeopsis megalops* (a smaller deep-water shrimp) were mixed in the red shrimp catches in all areas fished. The largest catch was made south of Mobile in 210 fathoms. The heads-on count of this species varied from 45 to over 60 a pound.

The Oregon was scheduled to depart Pascagoula on July 17 to carry out eight days of experimental tuna long-line fishing in the north-central Gulf area. The primary objectives of this cruise were to obtain additional information on the depth limits of yellowfin tuna stocks, and to obtain tuna samples for technological study.

Eight 50- to 100-basket sets were to be made, in each of which 10- to 20-basket units were to be set in 25- to 50-fathom depth intervals, from the surface to depths of 200 fathoms.

A series of different size groups of yellowfin tuna were to be subjected to a variety of handling methods (bleeding, chilling at various time intervals after landing, dry and brine freezing, etc.) and samples were to be frozen for laboratory studies on meat discoloration by the Service's Technological Section.



## Food Irradiation Sterilization Pilot Plant

The three most suitable sites for a proposed multimillion-dollar Federal pilot plant for research and development of techniques for irradiation sterilization of foods will be selected by a committee of five civilian scientists. The Maine sardine industry's research director Dr. Berton S. Clark has been named to sit on this committee. Dr. Clark, on July 11, accepted the non-paying assignment at the request of the United States Quartermaster General and the National Academy of Sciences, reports a news release from the Maine Sardine Industry.

A government committee will suggest 10 sites as the result of preliminary screening and the civilian committee will review and evaluate the data and select the three best possibilities.

Dr. Clark, whose home is in Oak Park, Ill., is a former research director for the American Can Company and entered the employ of the sardine industry two years ago to head up a technological research and quality-control program. His headquarters are at the University of Maine.



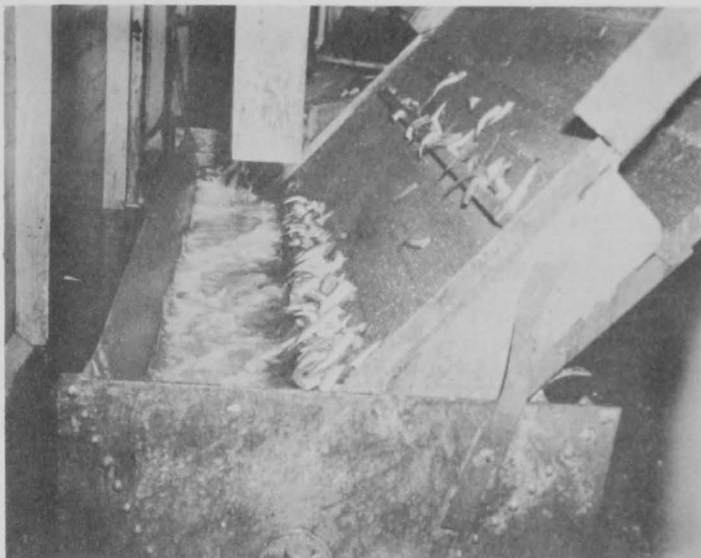
### Maine Sardines

**CANNING COSTS INCREASE:** Maine sardine canners, now working on the new season pack, have been told to expect greatly increased production costs over the 1955 season, a June 7 Maine Sardine Industry news release announces.

A raise in the minimum wage as set by Congress from 75 cents to \$1.00 an hour plus boosts in oil, cans, cases, salt, and freight all adds up to a substantial figure. Volume as it affects general overhead of individual packers will have considerable bearing on the ultimate cost picture, but under any circumstances the increases will be the highest for any single year in the history of the industry.

This disturbing situation was outlined for the packers June 7 by a Rochester, N. Y., auditing firm, which has been employed by the group to conduct an industrywide cost-accounting program for the past two years.

A schedule of the increases as they apply to the standard 100-can case of keyless and key-opening oil-type, which are the principal items packed, was supplied by the firm as follows: direct labor up 15 percent; indirect labor up 10 percent; oil up 21 percent; cans up 8.7 percent; cases up 5.5 percent; salt up 5 percent; and freight up 6 percent.



Washing dressed herring in a Maine sardine cannery.

In releasing the report the industry's Executive Secretary stated that with the new round of increases it was now costing Maine canners about \$2.00 a case more to pack keyless and \$2.50 more to pack cans with keys than it did in 1950 and nearly triple the 1933 figure.

"Naturally every cost increase makes our position in the food business all the more competitive, but we are still able to offer sardines at a price to the consumer that makes them one of the best buys on the market," the Secretary added.

He said that although selling prices varied during the past year they did not always reflect a realistic cost figure and that on numerous occasions and for many reasons shipments were moved at a loss to the canners.

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**CANNED STOCKS, JUNE 1, 1956:** Distributors' stocks of Maine sardines amounted to 160,000 actual cases as of June 1, 1956, a decrease of 108,000 cases

Type	Unit	1955/56 Season				1954/55 Season				
		6/1/56	4/1/56	1/1/56	11/1/55	7/1/55	6/1/55	4/1/55	1/1/55	11/1/54
Distributors' Stocks	1,000 actual cases	160	268	326	354	235	n. a.	331	n. a.	n. a.
Canners' Stocks	1,000 std. cases <sub>1</sub>	64	152	475	625	723	575	715	1,239	1,410

<sub>1</sub> / 100 3/4 oz. cans equal one standard case.

n.a. - not available.



(40 percent) from April 1, 1956. Stocks on June 1, 1956, were 166,000 cases less than January 1, 1956, according to estimates based on the results of a series of measurements for the 1955/56 marketing season by the U. S. Bureau of Census.

Canners' stocks as reported by the Maine Sardine Industry totaled only 64,000 cases (100-3 $\frac{1}{4}$  oz. cans) on June 1, 1956. Canners' stocks for the same month in 1955 amounted to 575,000 cases and on January 1, 1956, totaled 475,000 cases.



## Market Outlook for Fishery Products

**JULY-SEPTEMBER 1956:** The third quarter--peak production period for United States fisheries--will see a good catch of halibut, a good seasonal take of shrimp, opening of the oyster season, and the marketing of increasing supplies of canned tuna, Alaska salmon, and Maine sardines, according to the Commercial Fisheries Outlook, July-September 1956, issued July 17 by the U. S. Fish and Wildlife Service.


Already the tuna catch is 50 percent above the midyear mark of 1955 and the tuna pack is up 44 percent. Halibut fishermen are making catches which should

bring the halibut harvest this year somewhat above that of last year. While shrimp fishing has been at a seasonal low, it is now going into a period of peak production and unless adverse weather conditions hamper the fishermen the shrimp catch this year should be about normal.

The tuna industry is already making plans to market its big catch and pack. A big promotional campaign, in which the industry and the U. S. Fish and Wildlife Service will join forces, has been planned and the period September 13-22 has been designated as National Tuna Week.

The new pack of Alaska salmon will make its appearance on the American market in mid-August. Indications are that the total salmon pack this year will be about the same as that of 1955 which was below average. Landings of Columbia River and Alaska king (chinook) salmon have met with a ready market, whether the salmon was fresh or frozen. The early Columbia River chinook salmon pack was quickly sold.

# COMMERCIAL FISHERIES OUTLOOK



MARKETS

SUPPLY

DEMAND

July-September 1956

FISH AND WILDLIFE SERVICE  
United States Department of the Interior  
Washington, D. C.

Fishery Leaflet 336 cc

The Maine sardine industry got off to a slow start in June but most of the activity in that fishery is in this summer quarter. Historically the even-numbered years have been the big productive periods. Production of California sardines will begin in the fourth quarter.

Groundfish landings are expected to maintain the high level of the second quarter, although there will be a reduction in the catch of cod. Haddock stocks are about 25 percent greater than they were a year ago. Ocean perch landings which have been down somewhat are expected to increase.

Fresh-water fish landings have passed their seasonal peak.

Soft-clam production was low in Maine but the surf-clam harvest is 50 percent above the 1955 mark in the Middle Atlantic States. Hard crabs are plentiful in the Gulf and production is expected to reach a seasonal peak in Chesapeake Bay during this quarter. The oyster season on the Atlantic Coast opens in September. Sea scallops will reach a production peak in July and August.

There will be increases in the output of fish oil and fish meal and the year's output of each is expected to be about the same as that of last year, which set a record high.



### North Atlantic Fisheries Exploration and Gear Research

SMALLER CATCHES OF DEEP-WATER OCEAN PERCH MADE AT EDGE OF CONTINENTAL SHELF BY "DELAWARE" (Cruise 20): Five one-hour tows in deep water at the edge of the Continental Shelf in the vicinity of Sable Island, Nova Scotia, yielded ocean perch catches ranging from 5,000 to 8,000 pounds per one-hour tow during cruise 20 (May 21-June 2) of the Service's exploratory fishing vessel Delaware.

The objective of the trip was to check the availability at this season of the year of ocean perch in deep water at the edge of the Continental Shelf.

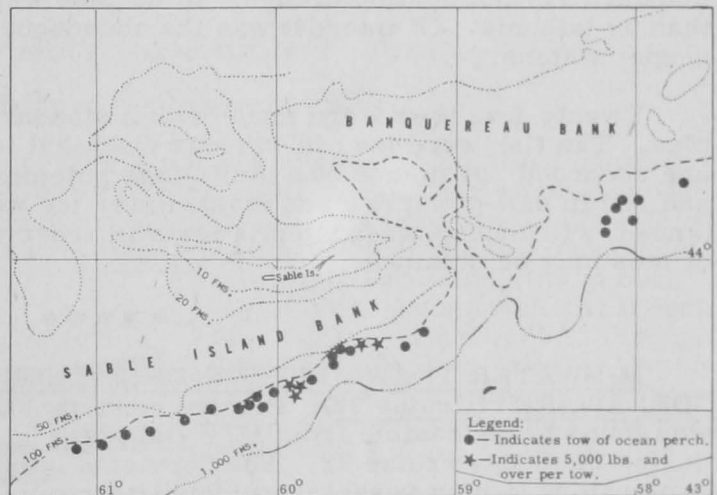
Tows during this trip were made in areas which had produced large catches of ocean perch on a previous cruise, up to 20,000 pounds a tow.

A total of 30 one-hour tows was made, in the 150- to 350-fathom depth range. The greatest catches were made on the 240-fathom contour.

A standard No. 41 trawl was used. Damage to nets was frequent. On 12 of the 30 tows, varying amounts of damage was inflicted to the net by rough bottom.

Average weight of the ocean perch caught was 1.1 pounds, with the largest fish being taken in the western portion of the operating area.

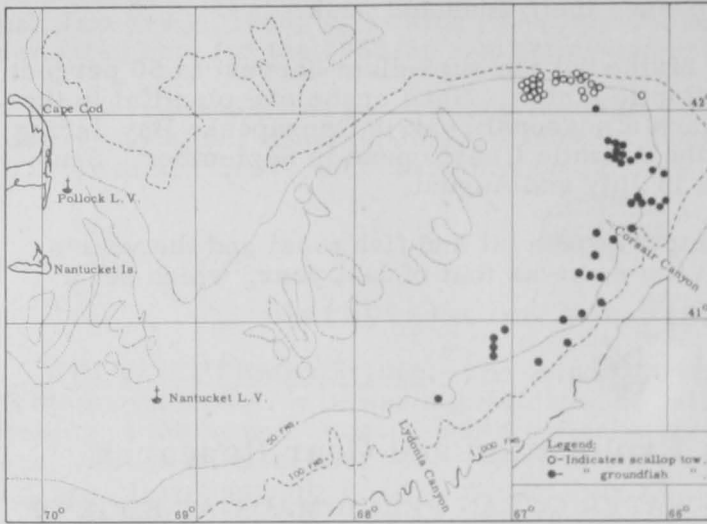
Scallop exploration and antibiotic ice experiments will occupy the Delaware during Cruise 21, which was scheduled to depart East Boston on June 11. Areas between the 50- and 100-fathom curves at the southern part of Georges Bank were to be explored for scallops, and groundfish samples for antibiotic ice experiments were to be taken.



M/V Delaware Cruise 20 (May 21-June 2, 1956).

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SEA SCALLOPS SOUGHT IN DEEP-WATER AND GROUND FISH SAMPLES COLLECTED (M/V "DELAWARE," Cruise 21): Complete absence of scallops from bottoms deeper than 55 fathoms was an exploratory finding of Cruise 21 of M/V Delaware.



M/V Delaware Cruise 21 (June 11-22, 1956).

water, outward from known productive scallop bottoms. The gear used was a standard 11-foot scallop dredge. In no case were scallops taken from depths deeper than 55 fathoms. Of interest was the abundance of fossil ocean quahog shells in deeper waters.

Twenty-five tows were made with a standard No. 41 trawl for groundfish samples. The fish were iced in various chemical ices, and temperatures during storage recorded by means of a multistage potentiometer. Cooling rates of haddock and cod in salt-water ice and fresh-water ice were obtained. The samples, when landed, will undergo organoleptic tests in order that data on storage in various types of ices may be obtained.

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MIDWATER TRAWL FISHING-DEPTH CONTROL FOUND FEASIBLE BY M/V "DELAWARE" (Cruise 22): Positive control of the fishing depth of a midwater trawl was found to be feasible from M/V Delaware during the 9-day cruise 22. The Service's exploratory fishing vessel terminated its trip at East Boston on July 13.

The mission of the trip was to develop methods for handling middepth trawls from the side of the vessel, Atlantic Coast style, and to gain experience in controlling the depth at which the net fished.

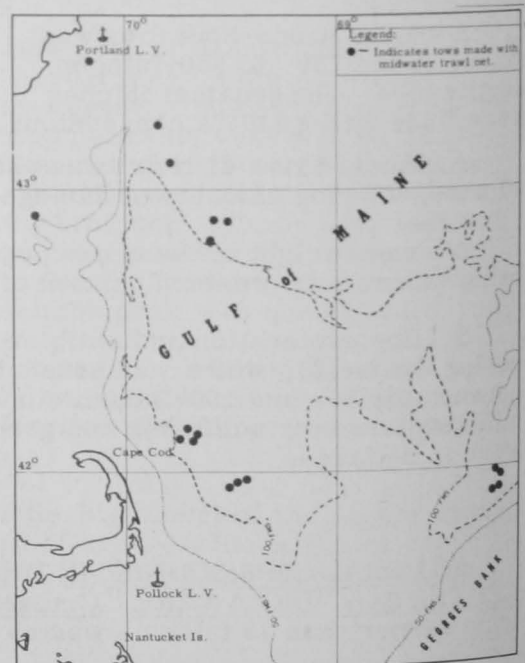
Gear used were two midwater trawls developed by the Service's Gear Research Station at Coral Gables, Fla. Both trawls are of nylon mesh,  $4\frac{1}{2}$  inches in the bodies, and  $3\frac{1}{2}$  inches in the cod end. Of box-type construction, the headropè is equipped with aluminum floats and the footrope with steel depressors at each corner. Spread to the net opening is provided by hydroflow doors.

Once in the water, a constant signal giving the depth of the net is provided by

aware. The 12-day trip ended with return of the Service's exploratory fishing vessel to East Boston on June 22.

The mission of the trip was twofold: the first half of the trip was devoted to exploration for scallops in the 50- to 100-fathom depth range in the vicinity of Georges Bank; the second half of the trip was used in obtaining samples of groundfish (haddock and cod) for antibiotic ice experiments being conducted by the Service's Boston Fishery Technological Laboratory.

Thirty-seven scallop drags were made in successively deeper



M/V Delaware Cruise 22 (July 5-13, 1956).

a telemeter device, developed by the Coral Gables Group.

In this fashion, using variations in vessel speed and length of towing wire, it was found possible to precisely control the depth of the net.

Future cruises are planned in which attempts will be made to apply this gear and technique to the capture of ocean perch.

M/V Delaware was scheduled to depart on July 23, 1956, for joint operations with M/V Albatross III. Mission of the operations will be to provide data on the efficiency of a "balloon" trawl in catching groundfish, compared with the efficiency of the standard No. 41 trawl.

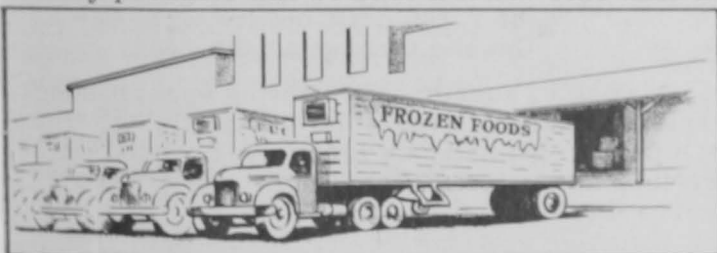


The Service's research vessel Delaware.



## Marketing Prospects for Edible Fishery Products, July-September 1956

Civilian consumption of fishery products per person during the third quarter 1956 in the United States is expected to be a little lower than a year earlier, and retail prices somewhat higher. Through mid-1956, civilian consumption of edible fishery products has been at a lower rate than a year earlier primarily because of



the small reductions in the packing of both canned fish and frozen fish sticks. Retail prices through mid-1956, judging from wholesale prices in major markets, averaged much higher than in the same period of 1955.

Commercial landings through June were substantially larger than a year earlier. The large increase in the catch of tuna and Pacific mackerel (which are used mainly for canning) more than offset the indicated small drop in the landings of species usually sold fresh or frozen.

Commercial freezings of edible fishery products in the United States during the first half of 1956 were slightly smaller than a year earlier. Although freezings will continue to increase seasonally during the summer months, for the year as a whole they are not expected to exceed those in 1955. Cold-storage holdings on July 1 were slightly lower than on the same date last year. Stocks of frozen products will increase during the remainder of the year as supplies are built up for distribution next winter when commercial fishing operations will be at the seasonal low point.

Through April, imports of fishery products, other than frozen tuna for canning, were much higher than in the same period of last year. Receipts of the major canned commodities were up by a third, and of the important fresh and frozen items by more than one-sixth. Sharp increases occurred for both canned salmon and fresh and frozen shrimp.



Exports of the important types of canned fish were a little lower than in the four months of 1955, with the increase for canned California sardines (pilchards) almost offsetting the large decline for canned salmon.

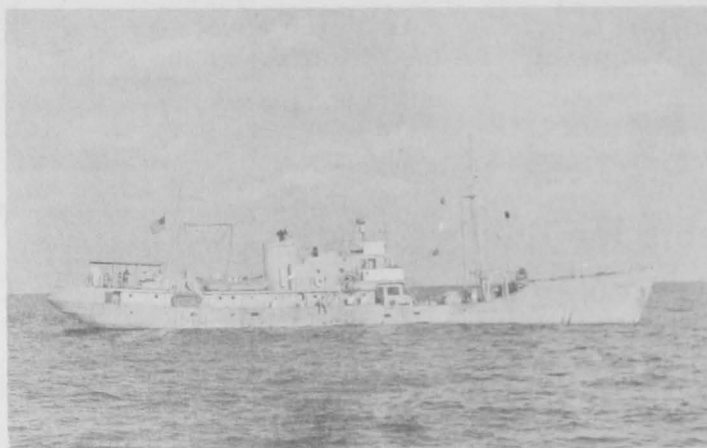
The analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's July 27, 1956 release of The National Food Situation (NFS-77).



## North Atlantic Fisheries Investigations

HADDOCK EGGS AND LARVAE DISTRIBUTION SURVEY CONTINUED BY "ALBATROSS III" (Cruise 76): The distribution of haddock eggs and larvae, temperature and salinity, and the general circulation pattern of the Gulf of

Maine and Georges Bank area were studied during a 13-day cruise (June 11-24) by the Service's research vessel Albatross III.



The Service's research vessel Albatross III.

During the cruise approximately 3,100 miles of continuous plankton tows were made at the surface and 10 meters with Hardy Plankton Recorders; 275 bathythermograph lowerings, 137 salinity samples, and 25 surface tows with the standard meter net were made. Samples of eggs were hatched out for identification purposes and a total of 1,140 drift bottles were released throughout the area.

Cusk, hake, yellowtail, rockling, gray sole, cunner, and whiting eggs; haddock, cod, pollock, hake, ocean perch, herring, rockling, gray sole, lumpfish, pilotfish, and threespine stickleback larvae were found. No haddock larvae were found off Long Island as in May, but a few were found over the southeast part of Georges Bank.

The Albatross III was scheduled to sail July 5 for Georges Bank to collect data on the distribution and density of sea scallops by means of dredging and underwater photography. All scallops taken were to be tagged and returned to the water.

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NEW FISHERIES RESEARCH VESSEL SHAKEDOWN CRUISE (T-79, Cruise 1): This was a shakedown cruise to test the suitability of T-79 as a fisheries research vessel, to test the fishing gear and hauling equipment, and to tag haddock. "Small Mussels" (18 miles southeast of Pollock Rip light vessel) was the area of operations.

Three sets were made, each consisting of one tub of line-trawl gear. The bait used was chopped frozen herring. A power gurdy was used to haul the trawl aboard.

This was the first research cruise aboard T-79 and the vessel was found to be adequate for line-trawling and fish-tagging purposes. The deck space is ample enough to permit safe comfortable areas for setting and hauling the gear and for the tagging operation. The trawl gear and hauling equipment worked satisfactorily.

A total of 65 scrod and large haddock were tagged through the gill cover with Petersen disc tags. Both yellow- and white-numbered discs were used. The tags were fastened with stainless-steel tagging pins.

Haddock were not abundant in the area at this time so that many of the hooks came up with no fish. About 15 cod were caught and subsequently released.

Another cruise aboard T-79 was planned about June 25 for the purpose of tagging haddock in the Gulf of Maine.



## North Atlantic Herring Research

FISH-FINDER SOUNDINGS BY M/V "METACOMET" LOCATE HERRING (Cruise 2): Continuous soundings to locate herring, recording continuous surface temperatures, bathythermograph casts, and eight experimental sets with the Canadian-type midwater trawl were the objectives of cruise 2 (May 30-June 6) of the M/V Metacomet, a Fish and Wildlife Service chartered exploratory fishing vessel. Five days of heavy fog curtailed operations.

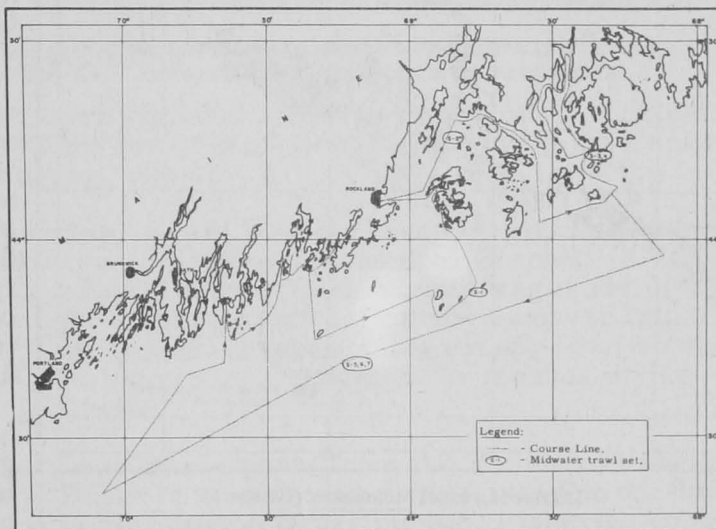
Scattered schools of fish believed to be herring were observed off Pemaquid Point and at the entrance to Friendship Harbor on May 30. A good showing of fish that made sounder markings characteristic of herring brit were sounded in the St. George River on May 31 and scattered schools were observed on the same date between Monhegan Island and Matinicus Island. A few scattered schools of fish were sounded in North Haven Harbor, near Cape Rosier, and in Eggemoggin Reach on June 1.

Also, one set of the trawl was made on fish near Cape Rosier, catching a small number of brit averaging approximately 2 inches in length.

June 2, 3, and 4 were spent in Blue Hill Bay. Small schools of fish on the bottom were observed near Long Island, Placentia Island, and in Union River during this period. Two sets of the midwater trawl here failed due to improper operation of one trawl door.

On June 5 and 6 soundings were made from Blue Hill Bay to Mt. Desert Rock, to Matinicus Island, to Monhegan Island, to 10 miles southwest of Portland Lightship, and to Boothbay Harbor. Very good showings of fish were recorded at 69° 4.5' W. longitude and 43° 40' N. latitude near Monhegan Island the night of June 5 at depths of from 20 to 75 feet and at the entrance to Boothbay Harbor on June 6.

The method of putting the trawl off the stern and towing from this position worked well but the doors did not work as they should at any time. Further work will be carried on to correct them.



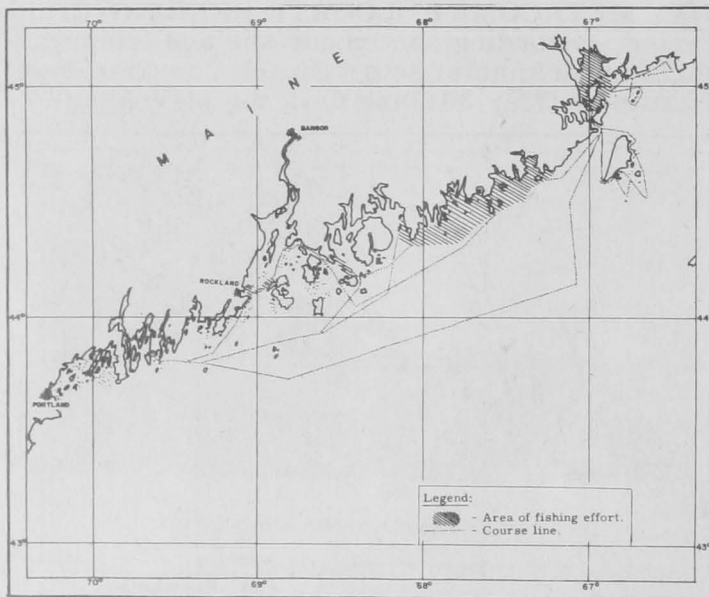
U. S. Fish and Wildlife Service Cruise 2 of Chartered M/V Metacomet.

Cruise 3 of the Metacomet was scheduled for June 13-22. The more eastward part of the Coast of Maine was to be worked first and most thoroughly on this cruise since heavy fogs prevented operations in that area during cruise 2. A radar set was installed on the Metacomet between the two cruises to combat the fog problem.

The fishing gear aboard on this cruise includes gill nets, a lampara seine, and a midwater trawl. It was hoped that with these three types of gear aboard any substantial bodies of fish located may be sampled.

\* \* \* \* \*

**FISH-FINDER SOUNDINGS OFF MAINE AND CANADA BY M/V "METACOMET"**  
(Cruise 3): Fishing and fish-finder soundings were carried out along the eastern part of the coast of Maine from Boothbay Harbor to Eastport by the M/V Metacomet, a Fish and Wildlife Service chartered exploratory fishing vessel. Similar work was done in the Canadian waters of Passamaquoddy Bay (St. Andrews Bay) around Grand Manan Island and in the Bay of Fundy near the Wolves Islands and along the North Shore to Cape Mace.



Chartered vessel Metacomet (Cruise 3).

of sardine-size herring were caught in the gill nets in St. Andrews Bay and in Machias Bay. Two catches of smaller herring averaging 4.7 and 4.1 inches, respectively, in standard length were made with the midwater trawl in St. Andrews Bay. Herring brit with average lengths of 2 to 2½ inches were located with fish finder and sampled in nearly all of the shaded area.

During this cruise an aerial survey was made in the area from Machias Bay to Cape Mace, including Grand Manan Island and all of Passamaquoddy Bay. A series of 6 flights was made, 2 in the early morning hours and 4 in the evening, in an effort to locate schools of herring. Although the major part of this area was covered in each of the flights no schools of herring were located.

Cruise No. 4 of the Metacomet was scheduled for July 9-18. Coastal and in-shore waters of the Gulf of Maine between Casco Bay and the Bay of Fundy were to be sounded with the fish finder and fished with gill nets and midwater trawl gear. This work was to be augmented with aerial work as during cruise 3, weather permitting.



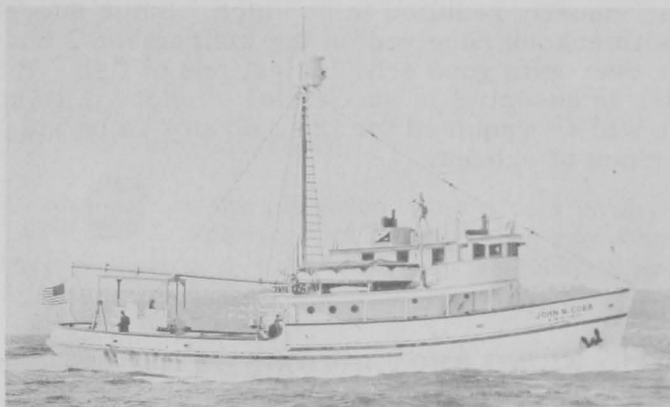
The major part of the cruise was spent in the area east of Frenchmans Bay. This plan of operation was followed in an attempt to gain more knowledge of the occurrence of herring in the areas where sardine-size fish were still relatively scarce or unreported at the time of the cruise. The cruise was made in two parts; June 14 through 22 and June 25 through 29.

The areas shaded on the diagram were fished with herring gill nets and a British Columbia-type midwater trawl. Small numbers

## North Pacific Exploratory Fishery Program

**PROMISING RESULTS WITH MIDWATER TRAWLS BY "JOHN N. COBB" (Cruise 27):** Some promising results in offshore midwater trawling were obtained on a 6-week cruise by the Service's exploratory fishing vessel John N. Cobb, which returned to Seattle on June 22. More than 20 species of fish were caught in the midwater trawls from the Washington coast to northern Vancouver Island.

Fishing from near the surface to within a few feet of the bottom, the vessel's mid-water trawl took mixed catches up to 5,500 pounds in 20 minutes. Largest catches were predominately hake, black rockfish, and dogfish. In one 2-hour tow with the trawl at 37 fathoms in water depths of 62-70 fathoms, the catch included 1,100 pounds of black rockfish and 320 pounds of hake. Up to 1,800 pounds of dogfish were taken with the Canadian midwater herring trawl off Vancouver Island.



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

Smaller amounts of lingcod, herring, smelt, Pacific ocean perch, and other less important commercial species were also taken on a number of tows. A surprising catch of pink shrimp was made in mid-water at night off northern Vancouver Island. Many tows caught nothing except jellyfish and plankton which caught in the meshes of the trawls.



M/V John N. Cobb Cruise No. 27 (May-June 1956).

Gear experts from the Fisheries Research Board of Canada and a biologist from the State of Washington Department of Fisheries cooperated in the experiments. The Canadian nylon midwater herring trawl was used in a number of tows along the west coast of Vancouver Island. No sizable schools of herring were located, and the best catch was 10 pounds of herring. Two nylon midwater trawls, with 40-foot and 50-foot square openings, made at the Service's Gear Research Station at Coral Gables, Fla., were used for the remainder of the 66 tows completed during the trip. These trawls had 4½-inch mesh in the bodies and 3½-inch mesh in the cod ends. After a few days of experience and with some modifications to the trawls and trawl doors, all gear operated satisfactorily in the offshore waters, even in fairly choppy seas.

Depth of the trawl was determined at all times with the telemeter which was developed especially for this work at the University of Miami Marine Laboratory. The instrument was attached to the trawl cable just ahead of the port door. Depth signals were received from the telemeter through a hydrophone, and the trawl was either raised or lowered to the desired depth by adjusting the amount of cable out



or the speed of the vessel. Greatest depth fished was 210 fathoms off the Washington coast in 800 fathoms of water.

A "Sea Scanar" and a recording depth sounder were used to locate schools of fish in midwater. "Blind" tows, made with no indication of fish on either instrument, usually resulted in no catch. Some success was obtained in correlating catches with echoes received on the instruments, but in some instances catches were poor even with good echo indications of fish. It was apparent that an electronic fish finder is essential to successful offshore midwater trawling, but extensive experience will be required for the operator to be able to identify species shown by different types of echoes.



## Oregon

**TRAWLING REGULATIONS REVISED:** Two changes in regulations effective June 20, governing commercial fishing for various ocean fishes in Oregon coastal waters, have been adopted by the Oregon Fish Commission, according to the State Fisheries Director.

In accordance with one change, only otter-trawl nets of a mesh size of three inches or less or  $4\frac{1}{2}$  inches or greater, stretched measure between knots, will be lawful. The new mesh sizes have been installed to provide maximum protection for small-size Dover, English, and petrale sole and still allow a legal harvest of Pacific ocean perch. The ocean perch gill badly and are difficult to remove from larger size mesh.

An additional revision of ocean fishing regulations provides that the incidental catch of Dover, English, and petrale sole, prohibited for use for reduction or as animal food, shall not exceed 2,000 pounds or 20 percent by weight, whichever is the greater, of a single landing, sale, or purchase. The regulation formerly limited the incidental catch of the three species to 2,000 pounds or 20 percent of a single trip or fare. The Director said the revision was adopted primarily to facilitate enforcement of the incidental catch regulation.



## Oysters

**REGULATIONS ADOPTED BY NATIONAL CONFERENCE OF WEIGHTS AND MEASURES:** Regulations which apply to the fresh shucked and canned oyster trade



Shucking oysters.

were adopted by the National Conference of Weights and Measures at the annual meeting in Washington, D.C., the last week in May 1956. These are the first regulations for the oyster industry which have been promulgated by this body. Automatically they become effective in several states and the recommendations of this body are given favorable consideration generally in the others. The regulations as adopted follow:

Oysters shall be classified in two groups.

**Group (1). Raw or Fresh Oysters**--Raw or fresh oysters in tins, glass, or other containers, shall be sold by avoirdupois net weight or liquid measure, and the package shall not contain more than 10 percent liquid at 45° F. Any tests made to determine the quantity of contents in a package shall consist of enough packages to total at least 1 gallon.

Group (2). Canned Oysters that are Heat Treated and Hermetically Sealed-- Canned oysters that are heat treated and hermetically sealed shall be sold by avoirdupois net weight, and the drained weight of the oysters in each container shall not be less than 59 percent of the declared net weight of the contents of the package.

The oyster industry recommends the following method be used, in the field, to determine the free liquid content of raw or shucked oysters.

"Open the container and, without pressure against the oysters in the container, drain for a period of one minute into a glass graduate, and from this procedure determine the amount of liquid so drained from the container.

"Since raw oysters are subject to changes in the pH value, due either to improper refrigeration or age, the use of a pH Comparator will determine any such changes. If the pH of the oysters reaches a pH of 5.8 or less, the free liquid content should not be determined."



## Pacific Oceanic Fishery Investigations

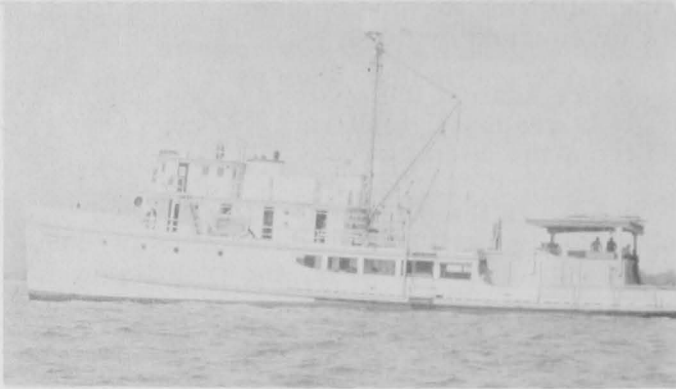
ALBACORE TUNA TAGGED ON JAPANESE FISHING GROUNDS: Two U. S. Fish and Wildlife Service investigators recently returned to Hawaii from Japan, where they carried out albacore tagging work in cooperation with Japanese fisheries research agencies. The two Service investigators arrived on May 16 in Tokyo, where they were put in touch with the various local research agencies actively engaged in the albacore tuna fishery. The Mie Prefecture Fisheries Experiment Station appeared most interested in participating in the albacore tagging program proposed by the Americans, and after a visit to the Station, at Hamajima in Mie Prefecture, and conferences with its director, a contract was concluded which made it possible to tag and release albacore from the Station's 200-ton "fisheries guidance vessel" Jini Maru.

Two tagging cruises were made, the first departing from Shimizu on May 29 and returning to the same port on June 8; the second departing Shimizu on June 9 and returning to Misaki on June 21. A total of 270 albacore were released with numbered tags of plastic tubing tied through the skin and muscles of their backs. The weight of the marked fish averaged about 20 pounds each.

The objective of such tagging experiments is to clarify the apparently wide-ranging but little understood migrations of this commercially-valuable "white meat" tuna species. Albacore marked with similar tags off the California coast and to the north of Hawaii have been recaptured by Japanese fishermen off the coast of Japan and in the open Pacific near Midway Island. It is hoped that recaptures of tagged tuna released within 500 miles of the Japanese coast from the Jini Maru may show whether or not there is a return migration of this species across the Pacific from west to east.

A secondary objective of the cooperative venture was to introduce the American tuna tagging method to Japan and to interest the Japanese in carrying on similar work independently in the future. It is anticipated that in the coming year the Japanese Fisheries Agency, through its Nankai Regional Fisheries Research Laboratory, will encourage and coordinate tuna tagging experiments by prefectural and other local research organizations. Large-scale tagging programs will also be carried out in the central Pacific and on the American west coast by American agencies in a concerted Pacific-wide effort to shed some light on the mysterious movements of this valuable commercial fishery resource.

**HAWAII SKIPJACK FISHING GROUNDS SURVEY COMPLETED BY "HUGH M. SMITH" (Cruise 34):** A two-month oceanographic and fishing survey in Hawaiian waters was completed when the Service's research vessel Hugh M. Smith returned to Honolulu on June 30. The cruise was part of an intensive investigation being made



The Service's research vessel Hugh M. Smith.

to determine reasons for the fluctuations in catches of skipjack tuna (aku) from year to year and to learn why catches of skipjack are high in some localities and low in others. During the cruise collections were made on 3 different occasions to study variations in the amount of plankton present during the period of the cruise and also to compare the abundance of plankton now with that at other times of the year. Water temperatures were recorded and sea-water samples collected for chemical analysis at a series of oceanographic stations occupied twice during the cruise.

Information gained from analyses of these data will aid in determining the variations in water flow through the island area which in turn may be associated with abundance of aku.

In addition to the study of the environment, plastic tags were placed on 200 skipjack as part of a two-fold project to learn more of the migrations of skipjack and to

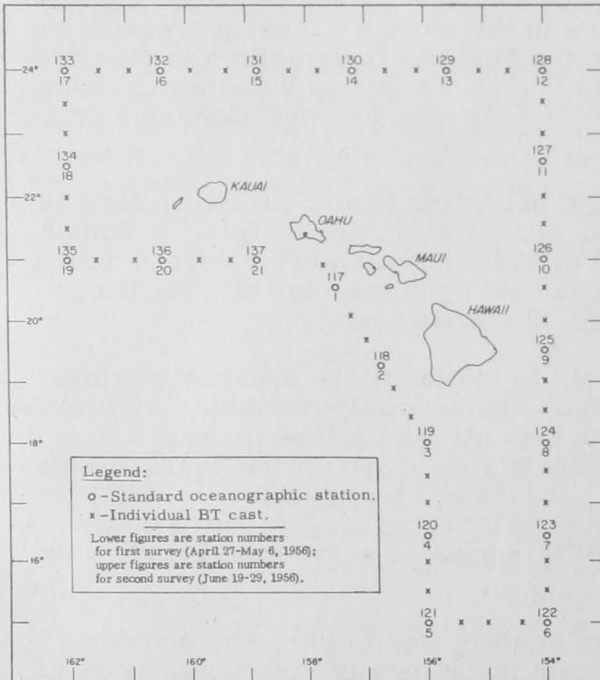


Fig. 1 - Hugh M. Smith Cruise 34 (April 27-June 30, 1956).

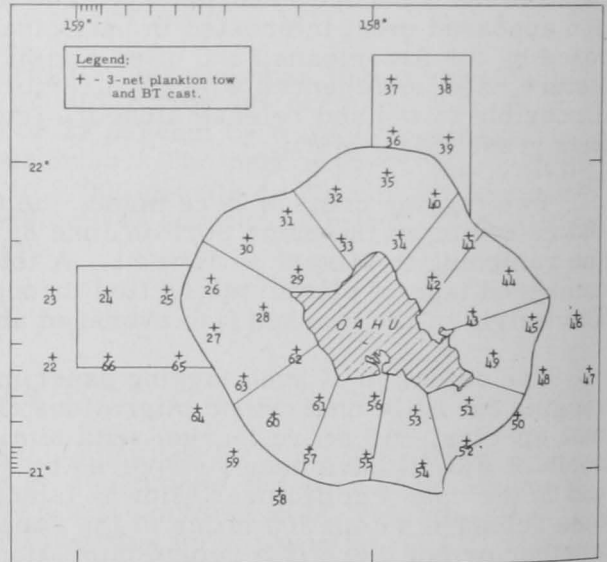


Fig. 2 - Hugh M. Smith Cruise 34 (April 27 - June 30, 1956).

devise better methods of tagging. Part of the fish were tagged and released about 120 miles to the north of Oahu while the remainder were tagged and released in waters adjacent to Oahu and Lanai. Some of the aku were tagged with a standard type tag while others were tagged with a new tag developed by Service biologists. Recovery of these tagged fish by local fishermen will furnish information as to migrations and growth of the skipjack and the suitability of the new tag. When operating within range of the local skipjack boats, radio broadcasts were made twice daily

to inform fishermen of the presence of fish schools sighted by the Hugh M. Smith. Moderate numbers of schools of both large and small skipjack were observed, but many of the schools were wild and difficult to fish.

Two skipjack scouting trips were made to the north of Oahu and one to the south (fig. 4). A total of 4 days was spent scouting beyond 100 miles north of Oahu. Fifteen bird-accompanied fish schools were observed of which 8 were identified as skipjack. A total of 103 16- to 20-pound skipjack and 2- to 3-pound skipjack were

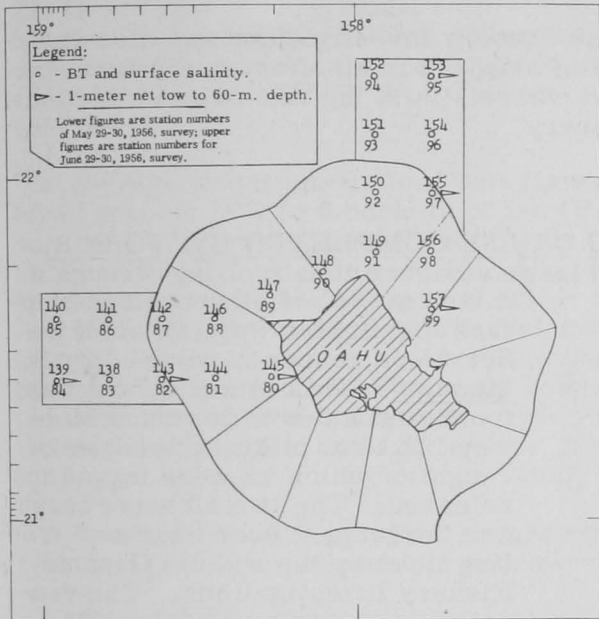


Fig. 3 - Hugh M. Smith Cruise 34 (April 27-June 30, 1956).

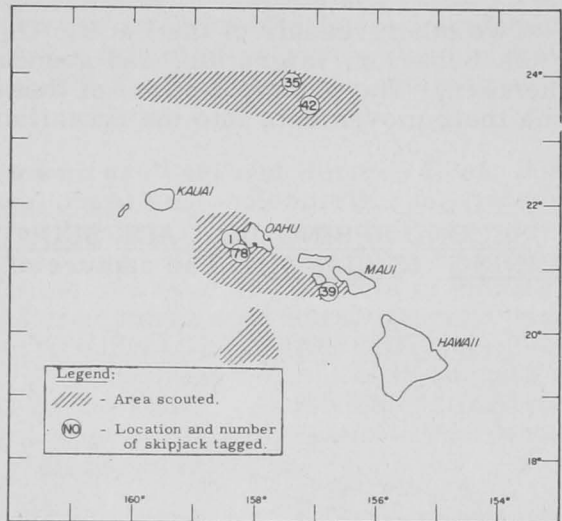


Fig. 4 - Hugh M. Smith Cruise 34 (April 27- June 30, 1956).

during 2 days of scouting 18 flocks were observed and 5 of these were identified as skipjack. No fish were caught during this period (May 14 to 28); 6 days were spent in fishing for bait with a total bait catch of 273 buckets of nehu.

During 7 days of scouting in waters adjacent to Oahu, Molokai, and Lanai (fig. 4) 44 bird-accompanied schools were observed and 12 of these were identified as skipjack schools. A total of 139 skipjack were caught and 118 of these were tagged and released. Experimental all-plastic dart tags were placed on 45, blue California-type G tags on 37, and white California-type G tags on 36 skipjack. One fish tagged with a dart tag weighed 20 pounds, the remaining 117 averaged 5 pounds in weight. Fishing and scouting for bait took 10 days during the period June 1 to 17 with a bait catch of 276 buckets of nehu.

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**SKIPJACK TUNA BEHAVIOR IN HAWAIIAN WATERS STUDIED BY "CHARLES H. GILBERT"** (Cruise 28): To determine why some skipjack (aku) tuna schools can be fished more successfully than others, the Service's research vessel Charles H. Gilbert studied the feeding reactions and the movements of the various schools encountered in Hawaiian waters. After a two-week cruise, the vessel returned to Honolulu on June 5.

The newly-installed "Scanar" was tested during this cruise. This electronic fish finder, which works like underwater radar, returned positive signals from 5 skipjack schools and suspected signals from 10 schools. One school was detected at a distance of 1,200 feet. With greater experience in the interpretation and identification of the echo signals, it is hoped that the "Scanar" will not only reveal the



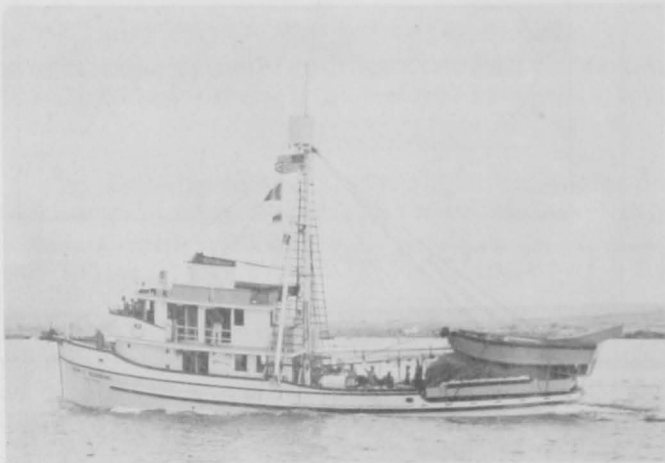
presence of tuna schools below the surface at some distance from the ship, but that it will also facilitate a study of their movements and behavior.

The vessel spent 10 full days of scouting during which 21 skipjack schools were seen. The schools were unusually wild and sample catches were made only with difficulty. One phase of this work is to see if there is any relationship between the "biting quality" of the school and the kind and quantity of natural food in the stomachs of the fish.

Two other vessels of the Pacific Oceanic Fishery Investigations are also studying the behavior, migration, and abundance of skipjack in an effort to aid the local fishermen. The principal effort of these two vessels is to tag the skipjack and thus trace their movements into the Hawaiian fishery.

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**SECOND SPRING SKIPJACK SCOUTING CRUISE COMPLETED BY "JOHN R. MANNING" (Cruise 31):** The capture of two large albacore tuna trolling through a



John R. Manning, one of the three research vessels of the Pacific Oceanic Fishery Investigations, at Pearl Harbor.

mixed school of albacore and skipjack highlighted this cruise of the Service's research vessel John R. Manning. This mixed school was found just a few miles from Midway. A total of 26 skipjack were caught of which 12 were tagged and released. The two albacore caught are the largest ever caught on trolling lines by the Pacific Oceanic Fishery Investigations. The vessel returned to port on June 22 after five weeks of skipjack scouting in the waters north of the Leeward Islands.

Additional schools of skipjack were found south and west of French Frigate Shoals. A school of yellowfin tuna was found northwest of

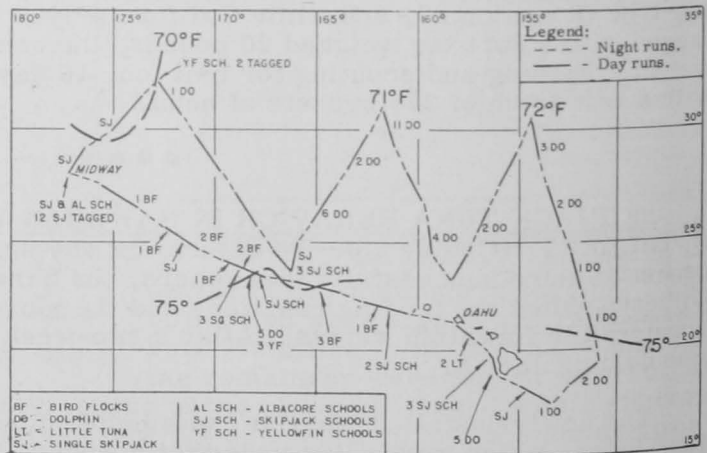
Midway and two of seven fish caught were tagged and released.

A survey of bait fish at Pearl and Hermes Reef, Midway and French Frigate Shoals showed a scarcity of iao or silversides, but fair numbers of small aholehole.

A census of Hawaiian monk seals showed an increase in pups at Pearl and Hermes where 108 adults and 25 pups were counted. At Midway, 10 adults and 5 pups were seen and at French Frigate Shoals, 18 adults and 10 pups were counted.

Direct trolling with 6 lines showed a lack of skipjack tuna in the waters north of the Leeward

Islands but a concentration of bird flocks and schools of very small skipjack (12" to 15") south and west of French Frigate Shoals on the initial run from Oahu to Pearl



John R. Manning Cruise 31 (May 19-June 22, 1956).

and Hermes Reef. Six identified schools and 11 bird flocks were seen on that run. In addition, a mixed school of dolphin and yellowfin was found about 150 miles south-west of French Frigate Shoals. A mixed school of skipjack (6-8 pounds) and albacore was found just off Midway. Two albacore of 42 and 48 pounds each were caught on the trolling lines, one got off and one was hooked on a pole but escaped. These albacore are the largest taken on trolling lines by POFI and the first to be hooked by a pole fisherman. The thermocline was extremely shallow in this area (10-20 ft.) which may account for the presence at the surface of these large albacore. Three schools of very small skipjack were seen inside the lagoon at French Frigate Shoals. Single skipjack were caught or hooked northeast of Midway and again north of French Frigate Shoals and south of Hawaii. A school of yellowfin was encountered at 32° 03' N., 172° 39' W. in water of about 70° F. Dolphin were common east of 165° W.

No significant amounts of bait fish were seen at Pearl and Hermes Reef. Scattered schools of 3 to 6 buckets of iao (*P. insularum*) and aholehole (*K. sandvicensis*) occurred at Southeast and Sand Islands. A few buckets of small mullet were seen at North Island. At Midway, 55 buckets of iao were found and caught at East Island. In addition, about 110 buckets of small aholehole and over 500 buckets of small goatfish (Mullidae) were seen at East Island and the adjacent sand bars. Around Sand Island, only scattered schools of aholehole (175 buckets), piha (*S. delicatulus*) (105 buckets) and iao (10 buckets) were seen. At French Frigate Shoals, 23 buckets of iao were seen of which 18 were captured, at East Island. In addition, 31 buckets of iao were seen at Gin and Little Gin. Small samples of iao and aholehole were taken for length frequency and maturity studies, when possible.

Twelve out of 26 skipjack caught off Midway were tagged with blue California-type G tags. Two yellowfin from the school northeast of Midway were also tagged.



## Public Eating Places Survey

**PUBLICIZING BENEFICIAL QUALITIES OF FISHERY PRODUCTS BELIEVED DESIRABLE:** According to the results of a scientific sample survey of 4,500 establishments representing all public eating places in the United States, it was found that 52 percent of the managers or operators of public eating places serving fish and shellfish felt that an educational program pointing out the beneficial values of fish and shellfish would definitely help them to increase sales of fishery products, while only 26 percent expressed doubt as to the usefulness of such a promotional effort, and 22 percent expressed no opinion.

	Total		Would		Would Not		Don't Know		No Reply	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States Totals	208,100		107,800	51.8	54,600	26.2	43,600	21.0	2,100	1.0
<b>By Regions:</b>										
Northeast . . . . .	68,000		34,400	50.6	18,900	27.8	14,400	21.2	300	0.4
North Central . . . . .	59,700		29,900	50.1	16,800	28.1	12,100	20.3	900	1.5
South . . . . .	45,900		25,000	54.5	10,300	22.4	9,900	21.6	700	1.5
West . . . . .	34,500		18,500	53.6	8,600	24.9	7,200	20.9	200	0.6

There are 208,000 public eating places in the United States which serve fish and shellfish. Operators of eating places are particularly interested in increasing their sales of fish since, in the opinion of a majority of them, there is as much or more profit from a serving of fish and shellfish as from a serving of other high protein items such as steak, roast beef, or chicken.

Final results of the survey, which is being financed by funds made available under the Saltonstall-Kennedy Act of 1954, are scheduled for publication this year.



## Saltonstall-Kennedy Act Fisheries Projects

SHRIMP, SPONGE, AND TUNA PROBLEMS RESEARCH CONTRACTS AWARDED: Three research contracts for projects to study problems in the tuna, shrimp, and sponge industries were recently awarded by the Fish and Wildlife Service, Secretary of the Interior Fred A. Seaton said July 7. The work is part of the Saltonstall-Kennedy program to increase production and markets in the domestic fishing industry.

Two of the projects, one an investigation of Florida commercial sponges and the other an investigation of the causes and prevention of "black spot" on shrimp, will be conducted by the Marine Laboratory of the University of Miami. The third, an oceanographic investigation of the eastern tropical Pacific Ocean for the benefit of the tuna industry, will be made by the Scripps Institution of Oceanography of La Jolla, Calif.

The scene of the oceanographic study, the tropical Pacific west of Central America, is the big fishing area for the American tuna fleet. The purpose of the study is to make it possible to forecast the time and area for good tuna fishing and so provide a scientific basis for increasing the efficiency of the tuna fishery.

Since tuna presence and abundance is dependent to a great extent upon food supply, and since plankton, which is the chief direct or indirect food source for ocean fish, is affected by water conditions, the many phenomena which affect water conditions will come within the scope of the study.

Among the things which bring about the fluctuations in the abundance of plankton are the chemical nutrients brought to the surface by "upwelling" of water from the lower reaches of the ocean and by the retention of fertile water in the "interface" between ocean currents. Hence the waters of the Baja California, Tehuantepec, and Panama upwellings and the interface between the Peru Current and the Gulf of Panama water will be subject to various physical and chemical examinations. The behavior and the relationship of tuna to the changes in water conditions will also be studied. The contract price with the Scripps Institution for an initial phase of the study is \$35,000.

"Black spot" in shrimp is a condition which became evident when shrimp fishermen began operations in shrimping areas located several days offshore in the Gulf of Mexico. While black spot carries no health hazards it does tend to lower the consumer acceptability of the product and to lower its value accordingly. The condition does not appear in the shrimp which are taken close to the Gulf ports and which are utilized within two or three days.

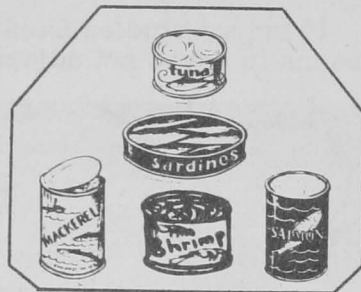
When black spot appears it is after the uncooked shrimp have been on ice for several days. In an effort to learn when it occurs and exactly what is the contributing factor to this condition, technologists will study every phase of the shrimp operations from the time the shrimp are caught until they are ready for use. The contract price with the University of Miami for this work is \$19,900.

The sponge research contract with the University of Miami is for \$12,000. It is an extension of a \$20,000 contract negotiated last year. This is a general investigation of the Florida commercial sponge resource. Specific attention is to be paid to the location and extent of the grounds, distribution, rate of reproduction and growth, the effect of nonselective harvesting, the effectiveness of the Federal minimum-size law, environmental factors, and sponge diseases.

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**CANNED FISH CONSUMER PURCHASES STUDY:** Approximately 2,500 housewives in 100 selected counties throughout the United States were scheduled to be interviewed in June in the course of a national consumer survey designed by the U. S. Fish and Wildlife Service to give a cross-section of the purchase pattern of the American housewife with respect to canned fishery products.

The results of the study will be of considerable importance to the domestic fishing and fish-processing industries in fitting their products into the general food tastes and buying habits of the householder, according to the Director of the Fish and Wildlife Service. The study will show whether the marketing practices of a given area are such that the consumers' desires for canned fishery products are satisfied.



Information will be obtained on (1) factors influencing the use or non-use of the various species and types of canned fish and shellfish in the household, (2) opinions and preference of consumers regarding certain characteristics of canned fishery products, and (3) methods of preparing and serving canned fish.

The project is being financed by funds made available by the Saltonstall-Kennedy Act of 1954.

The survey will be conducted under supervision of the Fish and Wildlife Service by W. R. Simmons and Associates Research, Inc., of New York City.

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**FOREIGN MARKETS FOR UNITED STATES FISH OILS BEING STUDIED:** A study of the markets for United States-produced fish oils with emphasis on the Western Europe and North Atlantic countries is being conducted by the U. S. Fish and Wildlife Service with Saltonstall-Kennedy Act funds. The study has two primary objectives:

1. Study the present and potential markets for United States-produced fish oils in Western Europe.
2. Study present and potential foreign fish-oil facilities as they constitute competition to the United States production in these markets.

The present survey is planned to cover Norway, Sweden, Denmark, the Netherlands, Germany, Belgium, France, England, and possibly Switzerland. The survey is being conducted by J. W. Stedman, Chief, Foreign Marketing Branch, Fats and Oils Division, Foreign Agricultural Service, U. S. Department of Agriculture on a cooperative contract with the Fish and Wildlife Service.

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**FRESH FISH CONSUMPTION INCREASE SOUGHT IN INLAND UNITED STATES:** A three-city study which could be the basis for a broad campaign to increase the consumption of fresh fish and shellfish in inland United States will be made during the coming months, the Director of the U. S. Fish and Wildlife Service announced July 1.

The three cities selected are Nashville, Tenn.; Indianapolis, Ind.; and Portland, Me. Portland was selected for comparative purposes to determine whether results of promotional efforts to expand the market for fresh fish differ in inland and coastal areas. For the purpose of the study fresh fish are defined as those,



dressed or not, which are not frozen, cured, or otherwise preserved. Fish which are simply iced are classified as fresh.

Previous studies have shown that the per capita consumption of fresh fish by persons in areas not adjacent to the sea coasts or to the Great Lakes is lower than that of persons living on the seaboard. The purpose of the study is to attempt to learn in more detail why this is so, and to explore ways and means of increasing the consumption of fresh fish in the inland areas.



Typical retail fresh-fish market.

Wholesalers, retailers, and housewives in the three cities will be questioned during the survey. Promotional campaigns will be discussed with fresh fish distributors and follow-up campaigns will appraise the effectiveness of any promotional efforts.

Information will be obtained on the species of fresh fish and shellfish sold in the stores; the quality of the fish and the amount of waste; the availability of the desired species; methods of handling and taking care of the fish; methods of display; dealers' preferences as to prepackaging; policy on markups; possibility of cooperative advertising and other promotional campaigns; trends in fish sales and the reasons.

In addition to the information which will be obtained from dealers who handle fish, interviews will be held with those who do not handle fresh fish to determine their reasons for not doing so.

Housewives to be interviewed will be primarily those who come to the stores to purchase fresh fish. The interviews will be in the store or at the home by appointment. The housewife will be asked if she is satisfied with the quantity and kind of fish available; the type purchased and the type preferred; suggestions on improvements on quality, display, packaging, dressing or other characteristics or factors; circumstances which might induce the housewife to use more fresh fish. In addition, housewives who do not purchase fresh fish will be interviewed to determine their reasons for not doing so.

The study will be made by the Bureau of Business Research, College of Business Administration, Boston College. Interviewing is scheduled to start October 1 and be completed by December 1. Between now and the start of interviewing, specific plans will be discussed with industry, and questionnaires prepared and pre-tested. The final report is not due until next spring.

The survey is part of the Saltonstall-Kennedy Act program for increasing production and expanding the market for domestic fishery products.



## South Atlantic Exploratory Fishery Program

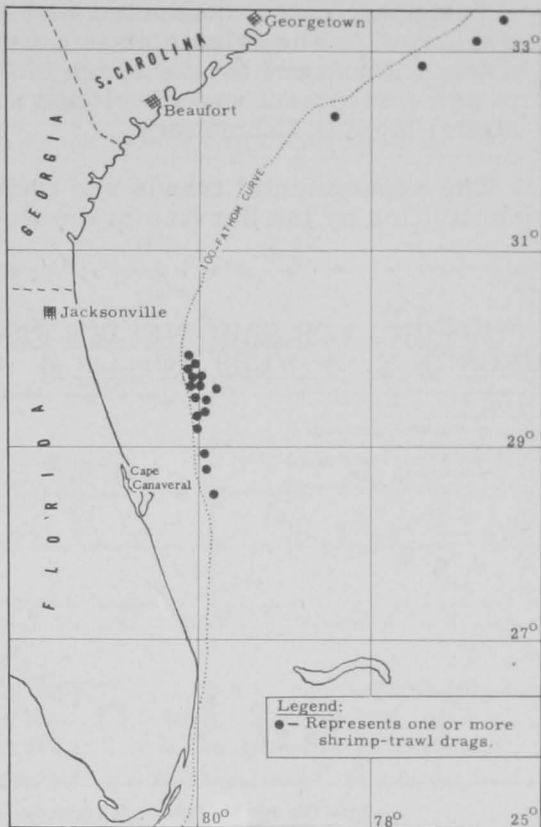
**MORE DEEP-WATER RED SHRIMP EXPLORATIONS BY "PELICAN" (Cruise 3):** Deep-water exploratory shrimp trawling by the Service's exploratory fishing vessel *Pelican* during May and June consisted primarily of additional exploratory coverage of the 150- to 225-fathom depth range from Cape Canaveral to St. August-

tine, including preliminary work with commercial-scale gear and bottom survey and exploratory trawling north of Jacksonville to Georgetown, S. C.

Twenty-five 4- to 5-hour drags between Cape Canaveral and St. Augustine produced 2,700 pounds of red shrimp (*Hymenopenaeus robustus*) during the period. The most productive drags were made in the 175- to 212-fathom range southeast of St. Augustine using a 40-foot trawl. Three tows in this area produced 1,020 pounds at a rate of 85 pounds an hour.

There was a complete loss of two commercial rigs, an 86-foot and a 60-foot flat trawl, due to parting of the  $\frac{3}{8}$ "-diameter towing warp.

The exploratory work in the red shrimp depth range north of Jacksonville revealed untrawlable bottom as far north as Beaufort, S. C. Four drags in the 170- to 250-fathom range from Beaufort north to Georgetown, S. C., produced a few *P. megalops*, a smaller deep-water shrimp (60-70 count, heads on), but no red shrimp. Bad weather prevented northward continuation of the trip.



Location of exploratory trawling stations by the Service's exploratory fishing vessel, Pelican.

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**MIDWATER TRAWLS AND TELEMETERING DEPTH FINDER TESTED BY M/V "GEORGE M. BOWERS" (Cruise 3):** Gear-research operations with experimental midwater trawls and with a recently-developed telemetering depth sounder were conducted by the Service's exploratory fishing vessel George M. Bowers April 6-April 19, 1956. These tests were made in offshore Gulf Stream waters between Fort Lauderdale and Key Largo, Fla.



The Service's research vessel George M. Bowers.

designed under experimental fishing conditions.

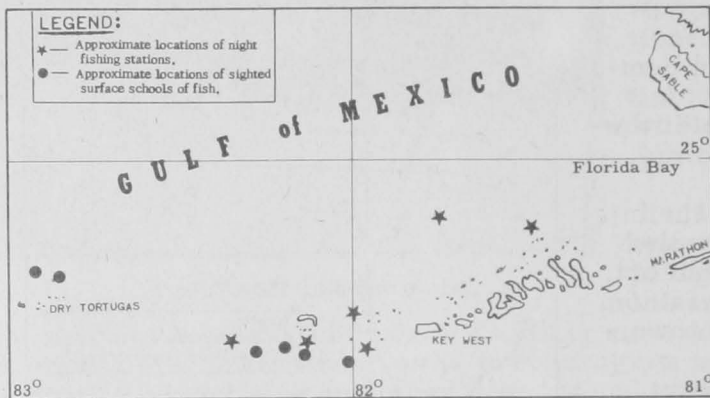
Continued research in single-boat midwater-trawling devices by the Service's Gear Research Unit at Coral Gables, Fla., has indicated that practical midwater trawls should be lightweight and strong, easily handled and maneuverable over a range of speeds, and that the trawl depth must be controllable at all times. Systematic investigations and observations of trawl behavior with undersea television and by divers with cameras have resulted in some improved designs. During this cruise a 30-foot cotton trawl and 40- and 50-foot nylon nets were observed to be performing as

Tests were also conducted with the telemetering depth sounder attached to the 40-foot trawl. The telemeter is a remote depth sounder designed to give accurate position of the trawl over a range of 0-200 fathoms and to one mile in distance. This new instrument was developed under contract to the Service by the University of Miami Marine Laboratory.

The experimental trawls and the telemeter are to be used in exploratory fishing activities by the Service in the Pacific Northwest and in New England waters.

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**FISHING FOR SARDINELIKE FISH OFF SOUTHERN FLORIDA BY M/V "GEORGE M. BOWERS" (Cruise 4):** Scouting and fishing for sardinelike fish in lower Florida Bay and around the Keys south of Marathon were the principal objectives of Cruise 4 (June 12-27) of the Service's exploratory fishing vessel George M. Bowers.



M/V George M. Bowers (Cruise 4).

Samples of sardinelike fish caught on this trip were frozen for technological studies. Anchovies, balao, and other unidentified species were preserved. Ten fishing stations were made at night between Marathon, Fla., and the Dry Tortugas. Harengula, weighing 6 per pound, were caught with a light

and trap lift net west of Snipe and Content Keys. Juveniles and small fish, one inch and less, were taken with a light and dip nets southeast of the Marquesas Keys. During daytime-scouting operations sardinelike fish were sighted and taken with a beach seine near the Dry Tortugas. Attempts were made to take surface schools of fish by trawling, but such schools were too wary and broke up or avoided the vessel.

A biologist of the Marine Laboratory of the University of Miami collected data from ten two-hour drags which were made on the Tortugas shrimp grounds. Using a fine mesh cover over the cod-end, shrimp escapement through different sizes of cod-end mesh was determined.



### U. S. Fish Stick Production

**APRIL-JUNE 1956 PRODUCTION BELOW LAST YEAR:** United States production of fish sticks in the second quarter of 1956 totaled 11.3 million pounds, according to Fish Stick Report, April-June 1956 (C. F. S. No. 1380) recently published by the U. S. Fish and Wildlife Service. This was 5.3 million pounds (32 percent)

Table 1 - U. S. Production of Fish Sticks, April-June 1956

Month	Cooked   Uncooked   Total		
	(Million Lbs.)		
April . . . . .	3.5	0.4	3.9
May . . . . .	3.4	0.4	3.8
June . . . . .	3.2	0.4	3.6
Total 2nd Quarter: 1956	10.1	1.2	11.3
1955	15.3	1.8	17.1
Total January-June: 1956	24.8	3.1	27.9
1955	31.8	4.3	36.1

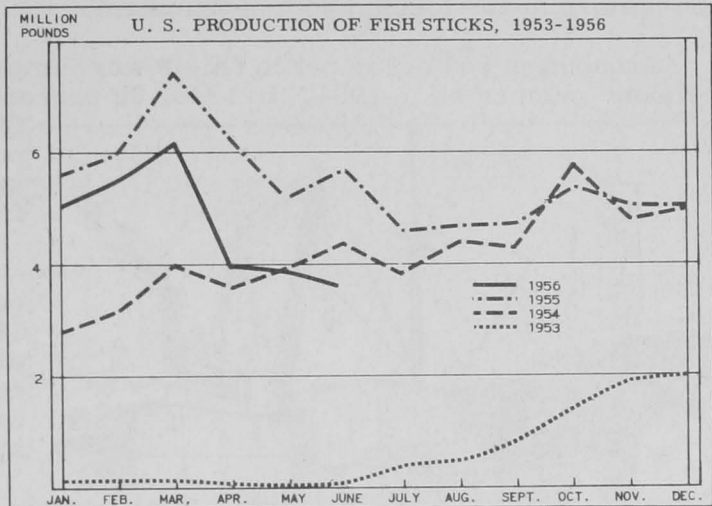
Table 2 - U. S. Fish Stick Production by Areas, April-June 1956

Area	April-June			
	1956		1955	
	No. Firms	Quantity Million Lbs.	No. Firms	Quantity Million Lbs.
Atlantic Coast States . .	27	9.2	28	14.2
Interior and Gulf States .	6	1.3	8	1.4
Pacific Coast States . . .	10	0.8	11	1.5
Total . . . . .	43	11.3	47	17.1

less than the quantity produced during the first quarter of the year and 5.8 million pounds (34 percent) less than the production reported for the corresponding period of 1955.

Production during the second quarter of 1956 averaged 3.8 million pounds a month as compared with an average monthly production of 5.7 million pounds during the second quarter of last year. The largest quantity of fish sticks ever produced during a single month occurred during March 1955 when 7.4 million pounds were packed.

In the second quarter of 1956, 89 percent of the total production was precooked. Uncooked sticks accounted for the remaining 11 percent. During this same quarter, 27 of the 43 producing firms in the United States were located in the Atlantic Coast States and accounted for 9.2 million pounds--82 percent of the total production. Plants located in the interior of the country and in the Gulf States manufactured 1.2 million pounds of fish sticks and firms situated in the Pacific Coast States produced nearly 838,000 pounds.



### U. S. Foreign Trade

**EDIBLE FISHERY PRODUCTS, MARCH 1956:** United States imports of edible fresh, frozen, and processed fish and shellfish for March increased about 1.6 percent in quantity, but decreased 2.2 percent in value as compared with February 1956. Compared with March 1955 the imports for March 1956 declined 18.2 percent in quantity and 5.4 percent in value. The dollar value in March 1956 was about 27.9 cents a pound, compared with 24.1 cents a pound in March 1955. Shrimp imports were about 1.5 million pounds higher in March 1956 when compared with March 1955, but the imports of groundfish fillets, canned fish, and salmon were lower.

Item	Quantity			Value		
	Mar.	Year		Mar.	Year	
	1956	1955	1955	1956	1955	1955
	(Million of Lbs.)			(Million of \$)		
<b>Imports:</b>						
Fish & Shellfish:						
Fresh, frozen & processed <sup>1/</sup>	62.8	76.7	768.3	17.5	18.5	206.4
<b>Exports:</b>						
Fish & Shellfish:						
processed <sup>1/</sup> only (excluding fresh & frozen)	6.3	7.1	91.0	1.3	1.6	21.8

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

Exports of processed fish and shellfish in March 1956 decreased about 7 percent from the February 1956 total, and were also down 11 percent from March 1955. The value of exports in March 1956 declined 13 percent when compared with February 1956 and 19 percent below March 1955.

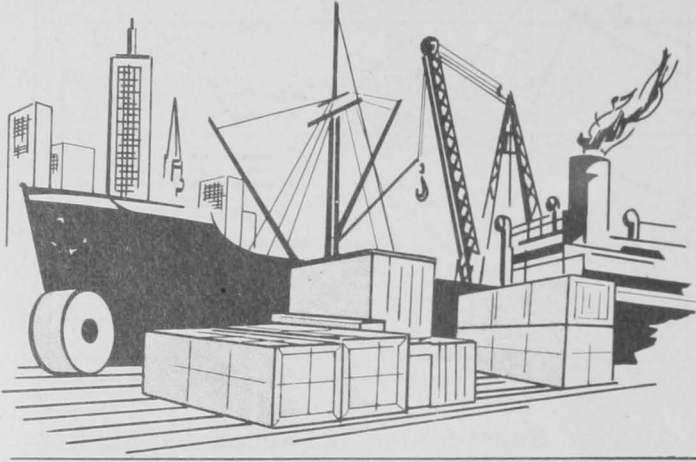
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**FISHERY PRODUCTS IMPORTED FROM MANY COUNTRIES:** More countries are now supplying fishery products to United States markets than in former years, according to a review of certain principal fishery products imports made by the U. S. Fish and Wildlife Service.



Shrimp was imported from 26 countries during 1955, compared with 23 countries in 1954. In 1940, 10 countries supplied shrimp to United States markets. Imports of fresh, frozen, canned, and dried shrimp in 1955 were valued at \$24.5 million dollars at the foreign port of shipment.

Groundfish and ocean perch fillets were imported from 12 countries in 1955--the same number as in 1954. In 1940, 99 percent of these imports were received from Canada and Newfoundland. Imports of these products during 1955 were valued at almost \$25 million f. o. b. foreign ports.



Tuna, in its various forms, came from 21 different countries in 1955. In 1940, 12 countries supplied tuna to the United States. United States imports of tuna were valued at the foreign port of shipment at \$33.2 million.

Lobsters, in their various forms, were imported from 28 countries during 1955. In 1954, 23 countries shipped lobsters, but only 10 countries supplied lobsters to the United States in 1940. Lobster imports in 1955 were valued at \$35.2 million f. o. b. foreign ports.

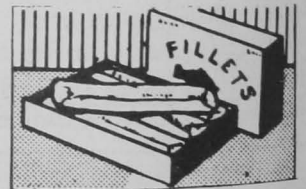
Swordfish came from 6 countries in 1955 as compared with 2 countries in 1940. These imports had a foreign value of \$5.4 million.

Crab meat imports originated in 6 countries, about the same as in 1940. Imports were valued at \$4.9 million.

In 1955 about 50 different countries contributed to the imports of the commodities shown. Imports of these products during 1955 totaled about 436 million pounds and had a value of \$128 million at the foreign point of shipment. In 1940, these same products totaled 66 million pounds at a value of \$10.7 million.

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**GROUNDFISH FILLET IMPORTS DOWN 10 PERCENT IN JUNE 1956:** Imports of groundfish (including ocean perch) fillets during June 1956 amounted to 7.5 million pounds as compared with 8.3 million pounds imported during June of last year. This 10-percent decrease was primarily due to a 1.0-million-pound drop in imports from Canada. Imports from Denmark and the Netherlands were also lower. Iceland, France, and West Germany exported somewhat more fillets to the United States during June 1956 than during the same month last year. There were no imports from Sweden, Norway, Japan, Greenland, Miquelon and St. Pierre, and the Union of South Africa during June 1956.



Canada continued as the leading exporter of groundfish fillets to the United States with nearly 6.0 million pounds during June of the current year--79 percent of the month's total fillet imports. Canada accounted for 84 percent of the total fillet imports during the same month last year.

Total groundfish and ocean perch fillet imports during the first half of 1956 amounted to 66.5 million pounds and for the corresponding period last year they

totalled 62.6 million pounds. Canada, with 44.8 million pounds, led all other countries exporting fillets to the United States during January-June 1956, followed by Iceland (15.2 million pounds) and Norway (2.3 million pounds).

Note: See Chart 7 in this issue.

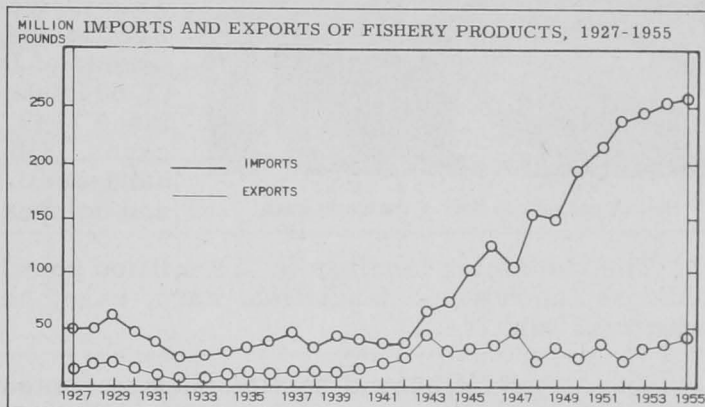
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**UNITED STATES FOREIGN TRADE, 1955:** United States foreign trade in fishery products and byproducts during 1955 was valued at more than 296 million dollars, according to Imports and Exports of Fishery Products, 1951-1955 (C. F. S. No. 1360), recently issued by the Fish and Wildlife Service. This was an increase of 4 percent as compared with the previous year. Imports of \$256 million were nearly 2 percent greater than those of the previous year, and exports of \$40 million were 27 percent greater than in 1954.

During 1955 imports of edible fishery products amounted to nearly 770 million pounds valued at \$207 million; nonedible products and byproducts imports were valued at \$49 million. Among the more important items imported

in greater quantity than in 1954 were fresh or frozen tuna; flounder fillets, swordfish, and other species; shrimp; canned salmon, tuna not in oil, crab meat, and common lobster; and pickled or salted cod.

Exports of edible fishery products in 1955 totalled 109 million pounds valued at \$25 million; nonedible products and byproducts were valued at \$15 million. Exports of canned fish and shellfish increased from 49 million pounds in 1954 to 89 million pounds in 1955 while the quantity of fish oils exported (143 million pounds) increased only 1 million pounds during the same period.



## Washington

**FISH AND SHELLFISH LANDINGS, 1955:** Food fish and shellfish landed by Washington commercial fishermen in 1955 amounted to 147.6 million pounds, with a wholesale value of \$33.5 million, according to a May 9, 1956, release by the State Department of Fisheries.

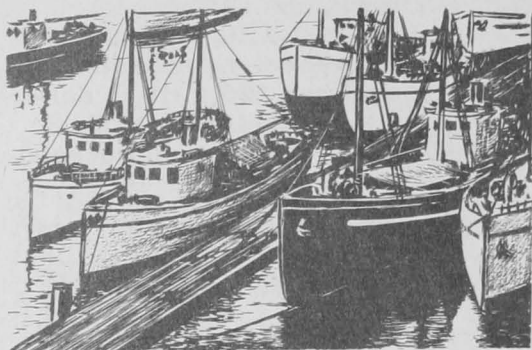
Nine states and Alaska outranked Washington in aggregate landings, but the value of the State's canned and processed fish was the third highest. Total pack was down slightly from 1954 because of the lower catch of sockeye salmon.

The quantity of the 1955 catch has been exceeded seven times since 1935, although the 1955 total is well above the 20-year average of 137 million pounds.

Salmon fishermen landed 8,381,400 fish worth \$11,945,000 ex-vessel at an average of \$1.43 per fish. The total salmon catch of 61.6 million pounds (22 percent of the U. S. and Alaska catch) was the smallest odd-year catch of salmon since 1943. The most prolific species of salmon, the odd-year pink, yielded 31,691,800

pounds, but the catch of chum salmon was the lowest since records have been maintained on the Puget Sound fishery.

The otter-trawl and long-line fleets landed 58.2 million pounds of sole, Pacific ocean perch, rockfish, and halibut; all with a processed value of \$7.9 million. The catch exclusive of halibut totaled 42.1 million pounds. Only 1954 and 1945 were better trawl years.



Halibut and salmon fleet of the West Coast.

Shellfish production totaled 19.4 million pounds worth \$6.0 million when processed. This included 10.1 million pounds of shelled Pacific and Olympia oysters, and 6.7 million pounds of Dungeness crabs. The crab catch (3,606,000 in number) was the second best since 1949. The 1954 crab catch was 4,182,700 crabs. Other shellfish production included hard-shell and razor clams, shrimp, scallops, and octopus--2.6 million pounds.

The remaining landings of 7.9 million pounds came from smaller fisheries on albacore, anchovies, candlenfish, carp, hake, herring, shad, smelt, sturgeon, and industrial fish.

The statewide canned salmon pack amounted to 613,798 48-pound cases, of which 412,159 cases were pink salmon. While the total pack was not exceptional for an odd year, it was well above the average of 578,070 cases for pink salmon years since 1935. Puget Sound packers also processed 64,584 cases of salmon, mostly chum, from fish imported from Alaska and British Columbia.

For the first time figures are included on personal-use pack of salmon, razor clams, and other seafood. The 1955 pack was 6,527 48-pound cases. The 1954 pack was 4,427 cases.

The wholesale value of the entire salmon catch, excluding the pack from imported fish, was \$21.5 million.

The State's production of all species of fish and shellfish comprised 3.2 percent of the poundage and 6.4 percent of the value of all fishery products landed in the United States and Alaska in 1955.

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#### OLYMPIA OYSTER INDUSTRY ENDANGERED BY EXCESSIVE MORTALITY:

The Olympia oyster which is native to the Puget Sound area of the State of Washington is threatened with extinction, according to industry spokesmen in that area. The oystermen predict that 90 percent of the Olympia oyster stocks will be wiped out within a year if mortalities continue at the present rate. The causes of the high rate of mortality is uncertain. Biologists of the Washington State Fisheries Department, who are investigating the problem, have not reached a final conclusion. However, fisheries biologists blame some of the losses on a parasitic flatworm which was introduced with the importation of Japanese or Pacific oyster seed.





Wholesale Prices, June 1956

Lower prices in June for fresh drawn haddock, fresh and frozen haddock fillets, frozen ocean perch and flounder fillets and fresh shrimp caused the June 1956 overall wholesale index (109.7 percent of the 1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned) to drop 1.8 percent below that for May. However, this June's overall index was still 5.8 percent higher than in June 1955.

At Boston a labor-management dispute at a large fish cold-storage warehouse, which disrupted normal marketing of fish landings, and the usual seasonal increase in landings caused June 1956 ex-vessel fresh haddock prices to drop 20.6 percent below May and 35.7 percent below the same month a year earlier. The opening of the Pacific Coast halibut season and the increased supplies of fresh and frozen halibut induced a drop in prices from May to June of 13.3 percent for this product, but this June's prices were still 44.4 percent higher than in June 1955. Fresh-water

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1956 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <sup>1/</sup> (\$)		Indexes (1947-49=100)			
			June 1956	May 1956	June 1956	May 1956	Apr. 1956	June 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					109.7	111.7	108.6	103.7
<b>Fresh &amp; Frozen Fishery Products:</b> . . . . .					117.5	120.6	115.2	107.4
<b>Drawn, Dressed, or Whole Finfish:</b> . . . . .					106.3	113.3	100.5	101.3
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.06	.07	56.3	70.9	50.1	87.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.33	.40	107.3	123.8	106.2	74.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.64	.63	144.4	140.5	137.1	129.2
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.53	.62	131.4	153.7	171.0	120.2
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.69	.74	139.5	148.6	121.3	136.5
Lake trout, domestic, No. 1, drawn, fresh . . .	Chicago	lb.	.58	.51	117.8	104.5	110.6	107.6
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.34	.29	78.6	68.0	49.3	103.8
<b>Processed, Fresh (Fish &amp; Shellfish):</b> . . . . .					127.7	126.1	126.6	111.6
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.25	.27	85.1	91.9	81.7	107.2
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.82	.79	129.3	124.8	124.8	111.4
Oysters, shucked, standards . . . . .	Norfolk	gal.	5.50	5.50	136.1	136.1	139.2	114.4
<b>Processed, Frozen (Fish &amp; Shellfish):</b> . . . . .					112.1	115.2	114.3	103.2
Fillets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.40	.40	102.1	103.4	103.4	102.1
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.28	.29	86.3	91.0	91.0	81.6
Ocean perch, skins on, 1-lb. pkg. . . . .	Boston	lb.	.28	.29	110.8	114.8	114.8	106.7
Shrimp, lge. (26-30 count), 5-lb. pkg. . . . .	Chicago	lb.	.75	.76	116.1	118.1	116.5	103.4
<b>Canned Fishery Products:</b> . . . . .					98.7	99.0	99.2	98.3
Salmon, pink, No.1 tall (16 oz.), 48 cans/cs. . .	Seattle	case	21.27	21.27	120.0	120.0	120.0	109.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	case	10.60	10.60	76.4	76.4	77.1	90.1
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. . . . .	Los Angeles	case	7.50	7.50	87.5	87.5	86.1	88.1
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs. . . . .	New York	case	8.20	8.45	87.3	89.9	89.9	71.3

<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.

fish price trends at Chicago and New York were mixed, with whitefish prices lower because of adequate supplies and yellow pike and lake trout prices higher because of light supplies. All of these factors caused the June 1956 index for the drawn, dressed, or whole finfish subgroup to drop 6.2 percent below May, but it was 4.9 percent higher than in the same month in 1955.



From May to June higher prices for fresh shrimp at New York City more than offset lower prices for fresh haddock fillets at Boston and the fresh processed fish and shellfish subgroup index rose 1.3 percent in that period. Compared with the same month in 1955, the June 1956 index for this subgroup was 14.4 percent higher because substantially lower prices for fresh haddock fillets were more than offset by considerably higher prices for fresh shrimp and shucked oysters.



Fish auction at Bost Fish Exchange.

All items appearing under the frozen processed fish and shellfish subgroup were priced lower this June than the previous month, and the index for this subgroup dropped 2.7 percent during that period. The index for this subgroup was 8.6 percent higher this June than in the same month a year earlier because frozen haddock fillets, ocean perch fillets, and shrimp were priced considerably higher.

There was very little price movement in the canned fishery products subgroup items with prices this June only slightly lower than the previous month and only slightly higher than in June 1955. With the appearance of the new pack of Maine sardines on the market, prices for this product dropped slightly from May to June in spite of the fact that the pack through June was not very substantial. Compared with June 1955, prices this June were considerably higher for canned Maine sardines and pink salmon because supplies were rather limited, but canned tuna prices were 15.2 percent lower because there were more than ample supplies.



#### IMPORTS AND EXPORTS OF FISHERY PRODUCTS, 1951-1955

This annual bulletin (Imports and Exports of Fishery Products, 1951-55, C. F. S. No. 1360) shows United States fishery import and export data for the years 1951 through 1955. The quantity and value of the fishery products and byproducts imported and exported by type of product are shown.

Copies of this publication are available free from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.