

# TRENDS AND DEVELOPMENTS

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

A total of 53 vessels of 5 net tons and over received first documents as fishing craft during July 1955, according to the U. S. Bureau of Customs. This was a decrease of 23 vessels (30 percent), compared with the 76 fishing craft newly documented during the corresponding month of 1954.

All areas, with the exception of the Pacific and New England areas, showed decreases in newly-documented vessels. In the Pacific area, 26 vessels were documented, compared with 13 reported for July 1954; and the New England area added 5 vessels to its fleet during July of this year, compared with 3 for the

same month of last year. The most pronounced decrease occurred in the Gulf area, where only 7 vessels were documented, compared with 31 during July 1954. The Chesapeake Bay area had 3 additions, the South Atlantic area had 10, and Alaska, 2.

During January-July 1955, a total of 264 vessels were documented for the first time as fishing craft, compared with 529 for the corresponding period of last year-- a decrease of 50 percent.

U. S. Vessels Issued First Documents as Fishing Craft, July 1955 and Comparisons					
Section	July		Jan. - July		Total 1954
	1955	1954	1955	1954	
	. . . . . (Number) . . . . .				
New England . . . . .	5	3	15	21	23
Middle Atlantic . . . . .	-	3	9	13	15
Chesapeake Bay . . . . .	3	8	27	62	93
South Atlantic . . . . .	10	14	40	77	119
Gulf . . . . .	7	31	55	255	313
Pacific . . . . .	26	13	86	76	117
Great Lakes . . . . .	-	-	5	3	6
Alaska . . . . .	2	4	25	20	27
Hawaii . . . . .	-	-	2	1	1
Puerto Rico . . . . .	-	-	-	-	2
Unknown . . . . .	-	-	-	1	1
Total . . . . .	53	76	264	529	717

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



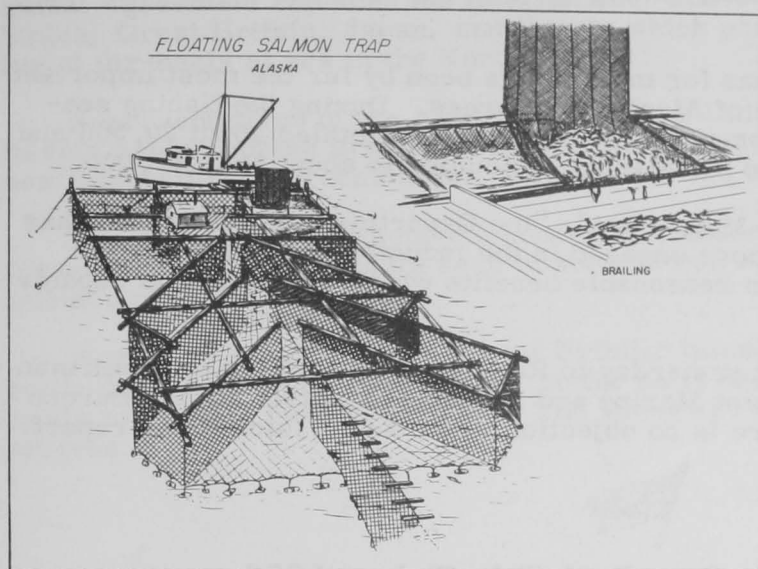
### Alaska

**FISH-TRAP ELIMINATION LEGISLATION SUPPORTED BY SECRETARY McKay:** Secretary of the Interior Douglas McKay on October 8 urged that Congress enact legislation to provide for the gradual elimination of fish traps in the waters of Alaska.

Secretary McKay said that a shift in the industry from trap fishing to fishing with less expensive type of gear may be expected to strengthen the competitive position of individual fishermen or small-scale operators. "With a limited resource to develop," he declared, "it seems right that opportunities to participate in it should be distributed as widely as possible."

In a report prepared at the request of the House Committee on Merchant Marine and Fisheries, Secretary McKay said that the Department recommended that Congress act favorably along the general lines of H. R. 242.

This bill, now pending before Congress, would authorize and direct the Secretary of the Interior to close down, over a five-year period, all salmon traps in the waters of the Territory.



At present, Secretary McKay pointed out, he has no authority to abolish the traps, since under existing law he may not discriminate against one form of gear or in favor of another. Therefore, he said, if the traps are to be eliminated it must be done by congressional action.

Secretary McKay said that if Alaskans had control of the matter, they would undoubtedly have started action to abolish fish traps long ago.

He noted that in an advisory referendum held in October 1948

the electorate of Alaska voted, by a majority of 19,712 to 2,624, in favor of a proposal that fish traps be gradually abolished over a period of 10 years. In addition, the Secretary said, the Territorial legislature has on more than one occasion memorialized the Congress to prohibit trap fishing.

"The Department of the Interior believes," he said, "that the Federal Government should attempt to create a more normal pattern of regulation and activity in a matter which is primarily of Territorial rather than Federal concern. This is particularly important when local sentiment strongly urges, as it does on this question, that Alaska regulations be brought in line with those found elsewhere."

The States of Washington and Oregon, the Secretary pointed out, abolished fish traps years ago.

"It is an anomalous situation," he asserted, "that fish traps still exist in Alaska."

Economic arguments in favor of abolishing the traps are decisive, the Secretary said.

"Traps are a form of fishing equipment which require capital outlays beyond the capacity of most individual fishermen to finance. Salmon are also caught in Alaska with purse seines, beach seines, gill nets, troll lines, and other types of gear. These are commonly owned by individual fishermen conducting small-scale operations."

"The Department has no particular objection to the formula set forth in H. R. 242," he said, "while recognizing that Congress might properly prefer some different period of time or different procedure."

For many years traps have been one of the chief methods of catching salmon in Alaskan waters. In recent years the proportion of the Alaskan salmon catch taken with traps has been declining, largely because of the closing, through regulatory action or voluntary agreement, of some of the trap sites in order to permit larger escapement.

"Various arguments have been urged in favor of eliminating the traps, not all of which have equal validity," Secretary McKay said. "For example, it is sometimes argued that the traps should be abolished as a conservation measure. Years of experience give no support to this argument. The basic conservation problem is one of permitting escapement of sufficient salmon to maintain the runs in succeeding years. That can be done as easily through regulating the traps as through regulating other types of gear."

The salmon fishing industry has for many years been by far the most important single industry based upon the use of Alaskan resources. During the fishing season of 1954 the number of people employed in this industry totaled about 20,500 and the value of the catch, as prepared for market, amounted to about \$68,200,000.

"For that reason," Secretary McKay said, "the Department of the Interior has a deep interest in the welfare of those engaged in the industry, as well as in the policies which permit the maximum reasonable benefits which the fishery is capable of yielding."

The Department's report sent yesterday to Rep. Herbert C. Bonner, chairman of the House Committee on Merchant Marine and Fisheries, stated that the Bureau of the Budget has advised that there is no objection to the submission of the report.



### Pribilof Islands Fur-Seal Skin Take, 1955

The annual sealing operations (June 22-July 31) conducted by the Fish and Wildlife Service on the Pribilof Islands in the heart of the Bering Sea netted 65,638 fur-seal skins, the Acting Secretary of the Interior reported August 28. The take was 1,756 skins greater than last year's production of 63,882 skins and close to the annual average of 65,000 skins. The uniform take of recent years indicates that the herd has stabilized at 1.5 million animals.

The fur-seal herd has grown from a low of about 132,000 in 1910, when the United States Government took over its management and protection. During this period the Federal Government netted some \$17 million--more than twice the purchase price of the entire territory of Alaska--from the sale of sealskins. This is one of the world's greatest achievements in the field of wildlife conservation.

Although the Federal Government has held a virtual monopoly on raw fur-seal skins in this country for 45 years, it has never learned how to transform a seal skin into the soft luxurious fur women have coveted since the days of Catherine the Great. Since 1913 the Government has had to depend upon a single firm in St. Louis for the processing of its entire supply of sealskins.



Alaska fur-seal.

The Fish and Wildlife Service has been directed to discover the mysteries of sealskin processing through a program of research financed out of proceeds from the semiannual sealskin sales. (At the last sale in April, 24,746 sealskins sold

for \$2,296,757.) Results of the research, one object of which will be to discover more economical methods of processing the skins, will be made available to the public.

Under terms of the Provisional Fur-seal Agreement of 1942, 20 percent of the annual Pribilof seal harvest is delivered to the Canadian government. The Provisional Agreement replaced the International Convention of 1911 between the United States, Great Britain, Japan, and Russia which prohibited pelagic sealing--the killing of fur-seals at sea in the North Pacific.

Representatives of the governments of the United States, Japan, Canada, and Russia are scheduled to meet in Washington on November 28, 1955, to negotiate a new international agreement for the conservation of the Pribilof Islands herd.

The Alaska fur-seals have a coat of soft underfur which distinguishes them from the common hair seals seen in zoos and circuses and which are widely distributed over the world.

Regularly each spring the great Pribilof Islands herd comes out of the sea to settle down on the volcanic rocks. So far as is known, this is the only land the animals touch upon during the year. The young are born a few weeks after the herd arrives.



### American Samoa

#### JAPANESE FISHING OPERATION CATCHES LESS TUNA THAN PLANNED:

The Japanese fishing company operating off American Samoa with the mothership Saipan Maru, completed early in September its first 3 months under a 6-months contract to the tuna cannery located in that Island. During the first half of the scheduled operation there was difficulty in locating the fishing grounds because of unfamiliarity with the waters, and the catch of 2,895 metric tons was less than planned. However, recently the fishermen have at last learned the grounds and the catch has picked up to about 3.25 tons per day. There are thus some prospects that the plan will be fulfilled in the latter half of the operation, reports the September 5 issue of Nippon Suisan Shimbun.

Whether or not the contract will be renewed was scheduled to be decided in discussions to be held when the president of the United States firm operating the American Samoa tuna cannery visited Japan in September.



### California

ALBACORE TAGGING CRUISE OF THE "DELUXE" (C-55-3): The commercial fishing vessel Deluxe returned to San Diego on July 28 from a seven-day trip to further the California Department of Fish and Game studies

Albacore Tuna Tagged by California Department of Fish and Game				
Area	Tag Color			Total
	Pink	Blue	White	
	. . . . (Number) . . . .			
50-60 mi. SW. San Diego .	5	4	5	14
40 mi. W. Todos Santos . .	7	8	7	22
35 mi. WSW. San Diego . .	2	-	2	4
Total . . . . .	14	12	14	40

of population, growth, and migrations of albacore tuna by tagging. The tags used were type G "spaghetti" tags, and during the trip the standard white tag was compared with pink and blue tags.

During the trip, 700 albacore tuna were caught and of these 40 were tagged and released in good condition. The table on the preceding page shows fish tagged by area.

Daily weather and sea conditions were recorded. The surface water temperature ranged from 61°-63° F. in areas fished. The number of boats fishing in the various localities was recorded. All fish were caught by trolling jigs and salted bait was used in an effort to keep fish near the boat after locating a school.

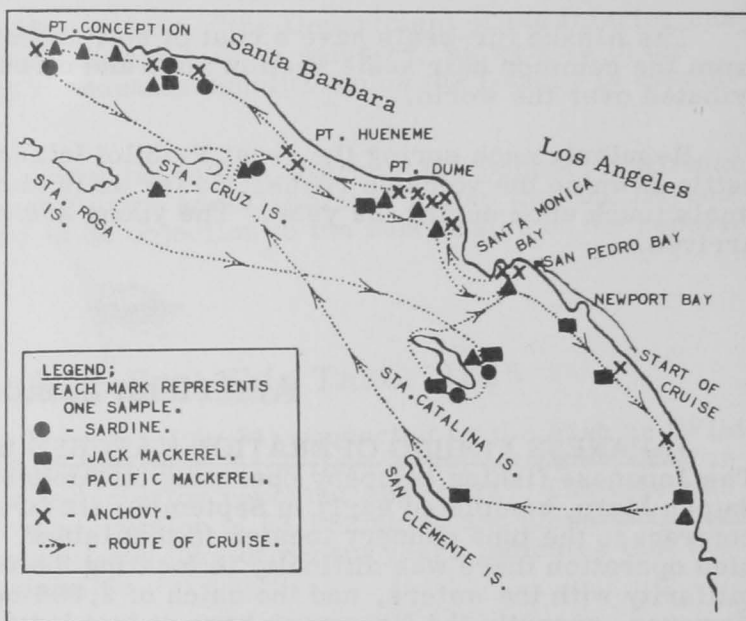
The use of the blue-dyed tags was discontinued when, after several days' exposure to sun and salt water, the color had faded appreciably.

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**ABUNDANCE OF SARDINES, MACKEREL, AND ANCHOVIES STUDIED BY "YELLOWFIN" (Cruise 55-Y-5):** The first of five cruises for 1955 designed to assess the relative abundance of

Pacific sardines, jack mackerel, Pacific mackerel and anchovies, off the coast of California and Baja California was completed by the California Department of Fish and Game's research vessel Yellowfin July 29. During the cruise, which began July 15th, the area off the coast of Southern California from Pt. Conception to Pt. La Jolla, including Santa Cruz, Santa Rosa, Anacapa, Santa Catalina, and San Clemente Islands was surveyed.

Collections were made at 50 light stations. Sardines were sampled at six stations, anchovies at 14, Pacific mackerel at 12, and jack mackerel, at eight. In addition Pacific mackerel, anchovies, and sardines were observed but not collected at one light station each. Fifteen other species were noted at one or more of the stations occupied.



M/V Yellowfin Cruise 55-Y-5, July 5-29, 1955.

The Yellowfin traveled a total of 427 miles while scouting for fish--139 schools were observed visually or with the aid of the Sea Scanar; 18 of these were estimated to be sardines, 49 Pacific mackerel, 2 jack mackerel, 28 anchovy, 5 saury, and 37 were unknown. Two schools of large fish (presumably bluefin tuna) were observed off Pt. Mugu and Pt. La Jolla. A large school group of sardines was observed in the Santa Barbara channel between Santa Cruz Island and Pt. Hueneme but could not be sampled due to adverse weather conditions.

Sea surface temperatures during the cruise ranged from 12.95-19.95° C. (55.3-67.9° F.). The following table gives the ranges in surface temperature in which the primary species were taken.

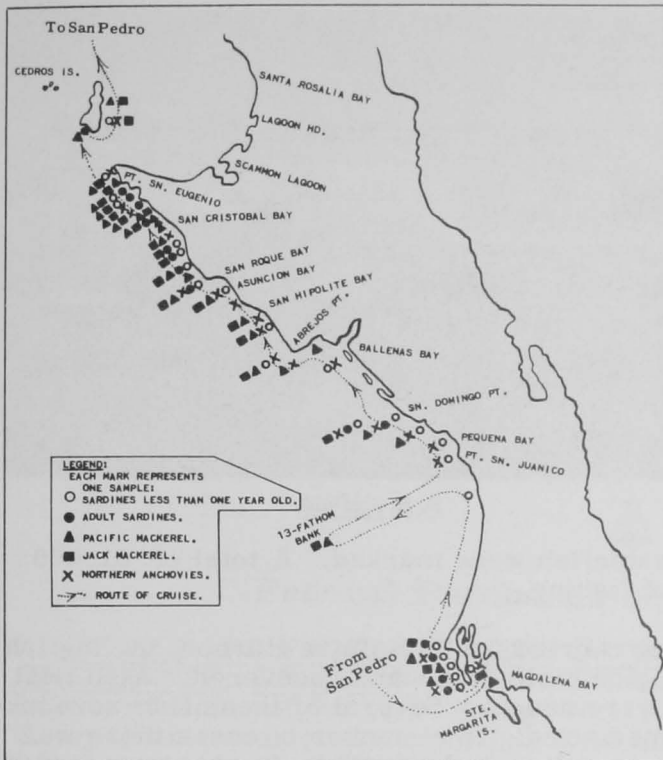
Species	Temperature Range			
	Minimum		Maximum	
	°C.	°F.	°C.	°F.
Sardine . . . . .	14.25	57.6	19.80	67.7
Anchovy . . . . .	12.95	55.3	19.35	66.8
Pacific mackerel . . . . .	14.25	57.6	19.80	67.7
Jack mackerel . . . . .	16.65	62.0	19.80	67.7

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**"YELLOWFIN" ASSESSES RELATIVE ABUNDANCE OF SARDINES, MACKEREL, AND ANCHOVIES (Cruise 55-Y-6):** To assess the relative abundance of sardines

spawned in 1955, and the relative abundance of older sardines, jack and Pacific mackerel, and northern anchovies was the purpose of Cruise 55-Y-6 by the California Department of Fish and Game's research vessel Yellowfin. The vessel, which sailed on August 8 and returned on August 28 to Los Angeles Harbor, operated along the coast of Baja California from Point Eugenia to Magdalena Bay and the area around Cedros Island.

During the cruise 65 light stations were occupied. Sardines were sampled at 29 stations, Pacific mackerel at 31, jack mackerel at 23, and northern anchovies at 21. Of the 29 stations at which sardines were taken, 24 yielded sardines of the 1955 spawning season of less than 125 mm. (4.9 inches) standard length, and 17 yielded adult sardines. In general, sardines appeared more abundant in this area than they did during a comparable cruise in 1954. Forty-five percent of the stations yielded either juvenile or adult sardines as compared with 34 percent in the same area during the 1954 survey.



M/V Yellowfin Cruise 55-Y-6, August 8-28, 1955.

The Yellowfin traveled a total of 348 miles while scouting for fish. A total of 246 schools were observed, of which it was estimated that 74 contained sardines, 17 Pacific mackerel, 100 anchovies, 13 jack mackerel, and 42 were unknown.

Sea surface temperatures ranged from 16.15°C. (61.1°F.) to 22.65°C. (72.8°F.). The following table gives the ranges in surface temperature in which the primary species were taken:

Species	Temperature Range			
	Minimum		Maximum	
	C.	F.	C.	F.
Sardine . . . . .	16.15	61.1	21.90	71.4
Pacific mackerel . . . . .	16.15	61.1	22.45	72.4
Jack mackerel . . . . .	16.15	61.1	21.80	71.2
Northern anchovy . . . . .	17.05	62.7	21.90	71.4

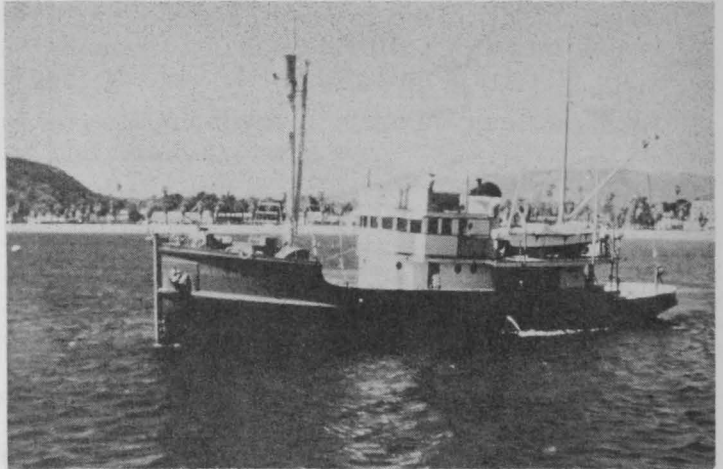
A total of 292 yellowtail (Seriola clorsalis) were tagged and released during the cruise. This total included 207 fish tagged on 13 Fathom Bank.

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**TRAWL-MESH EXPERIMENTS AND BOTTOMFISH TAGGING BY "N. B. SCOFIELD" (Cruise 4):** In order to obtain information on the escapement of small English sole and small Dover sole from 4-, 4½-, 5-, and 5½-inch mesh trawl-net bags and to tag true cod and sablefish, the N. B. Scofield, research vessel of the California Department of Fish and Game, sailed on Cruise 4 from Los Angeles Harbor

on July 14 and returned on August 20. Similar work in the past has been used as the basis for laws governing net-mesh sizes. This cruise was under the sponsorship of the Pacific Marine Fisheries Commission. A total of 57 drags were made off Humboldt Bay, Calif., NW. Cape Blanco, Ore., and the Coast of Washington in the vicinity of Destruction Is. and Swiftsure Bank, and also Holmes Harbor in Puget Sound.

Of the 57 drags, 26 were for English sole (Parophrys vetulus), 13 for dover sole (Microstomus pacificus), 5 drags for sablefish (Anoplopoma fimbria), and 13 for true cod (Gadus macrocephalus). As the numbers of true cod taken were small, the tagging crew kept busy on lingcod (Ophiodon elongatus) and sablefish. As a consequence, 16 true cod, 406 ling, and 680 sablefish were marked. A total of 51,000 pounds of fish were caught in 57 hours of fishing.



N. B. Scofield

As the mesh experiments were being carried out in Holmes Harbor, 12 English sole tagged in previous years by Washington biologists were recovered. Also two sablefish and a lingcod carrying marks were caught. Several of these fish were taken alive and were released after being measured. In a number of cases there was overlapping of catches so that mesh-comparison trawls could be used on two species concerned and in addition both lingcod and sablefish were taken for marking.

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**TAGGED STURGEON RECOVERED:** California's sturgeon are getting around these days, according to a September press release of the California Department of Fish and Game. A fish tagged by that Department in San Pablo Bay at the mouth of the Sacramento River, in November 1954, was recovered off Astoria, Ore., in the Columbia River by commercial fishermen, who returned the tag to California officials.

This marks the first time that concrete evidence has been obtained that the sturgeons migrate between the two great river systems. The fish was 49 inches long when tagged, and had grown one inch in the 10-months' interim.

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**FOOD TECHNOLOGIST NAMED FOR UNIVERSITY OF CALIFORNIA:** Harold S. Olcott, former Department of Agriculture food specialist, has been chosen as Professor of Marine Food Technology and Marine Food Technologist on the staff of the University of California's statewide Institute of Marine Resources. The establishment of the position is part of the planned development of the University's Institute of Marine Resources, which was established in 1953. Its headquarters are on the La Jolla campus of the University, but Olcott will work on the Berkeley campus.

According to the Acting Director of the Institute, the appointment of Olcott will initiate the fulfillment of a long-standing need for scientific work in the field of marine foods by the University of California. "The marine fisheries of the State constitute a very large industry with an even larger potential of food and feed. Development of these latent resources is in large part dependent on improved technology," the Acting Director said.

Olcott will also be directly associated with the Department of Food Technology, Berkeley, and will direct research work leading toward advanced degrees in food science and comparative biochemistry.



### Cans--Shipments for Fishery Products, January-August 1955



Total shipments of metal cans for fish and seafood during January-August 1955 amounted to 67,217 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 72,077 short tons for the same period last year.

The decline in the use of cans for fishery products is due to lighter packs of canned tuna and Maine sardines.

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



### Federal Purchases of Fishery Products

**FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF DEFENSE, JULY 1955:** Fresh and frozen fishery products purchases for the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force by the Army Quartermaster Corps in July 1955 amounted to 2 million pounds, valued at \$0.8 million (see table).

Purchases of Fresh and Frozen Fishery Products by Department of Defense (July and the First Seven Months of 1955 and 1954)							
QUANTITY				VALUE			
July		Jan. - July		July		Jan. - July	
1955	1954	1955	1954	1955	1954	1955	1954
..(Millions of Pounds) . .				. . (Millions of Dollars)..			
2.0	1.9	15.1	13.9	.8	.7	6.4	5.8

This was a decrease of 11.7 percent in quantity and 17.7 percent in value when compared with June purchases. July 1955 purchases were higher than in July 1954 by 8.1 percent in quantity and 22.9 percent in value.

Army Quartermaster Corps purchases of fresh and frozen fish for the first seven months in 1955 totaled 15.1 million pounds (valued at \$6.4 million), higher by 8.8 percent in quantity and 12 percent in value as compared with the similar period in 1954.

Prices paid for fresh and frozen fishery products by the Department of Defense in July 1955 averaged 40.2 cents as compared with 43.2 cents in June and 35.4 cents in July 1954.

In addition to the purchases of fresh and frozen fishery products indicated above, the Armed Forces generally make some local purchases which are not included in the above figures.





## Fishery Products Market Outlook, October-December 1955

Markets for most of the major fishery products are expected to be steady with firm prices during the fourth quarter of 1955, according to the Commercial Fisheries Outlook, October-December 1955, issued by the U. S. Fish and Wildlife Service on October 17.

Fishing in general becomes more difficult as colder weather sets in resulting in smaller landings. The North Pacific halibut fishing season closed September 21. Salmon fishing on the Pacific Coast will be limited to a few scattered fall catches. The tuna canning industry will operate at a moderate level. Groundfish landings in New England will also decline with demand being met to a major degree by supplies in cold storage.

Cold-storage holdings of most of the major fisheries are at high levels. However, holdings are not expected to be as high as during the fourth quarter of 1954. Demand for frozen fishery products will pick up the beginning of this quarter, although there will be some slackening during the Christmas and New Year holidays.

The fishing industry started the quarter by promoting its products with a theme of "Join the Fish Parade," during National Fish Week, October 3-8. National Tuna Week will be held November 3-12.

Several kinds of highly-desirable shellfish are expected to be abundant this quarter, including oysters, shrimp, hard clams, Pacific Coast dungeness crabs in December, and Atlantic and Gulf Coast blue crabs in October and November.

Cold-storage holdings of fresh-water fish in both the United States and Canada are at their seasonal peak this quarter. Fresh-water species expected to be in good supply are lake herring, sauger, sucker, yellow perch, and yellow pike. Lake trout and whitefish from lakes Michigan and Superior will find ready markets with firm prices.

Markets for fish meal and oil will be firm with some upward pressure as supplies become more difficult to obtain.

"At a glance," the outlook for some of the major fisheries is as follows:

HALIBUT: Supplies estimated 10 million pounds short of 1954's high level, but near the supplies of 1953.

SALMON: Very short canned pack for most species, so look for active demand in the fourth quarter.

GROUND FISH: Markets will be steady for cod, haddock, and ocean perch since cold-storage holdings are moderate for each species. Prices will increase slightly, but firm up toward the end of the quarter.

FISH STICKS: Production for the first half of 1955 is well ahead of 1954. Cold-storage holdings of block and slab fillets (the raw material for fish sticks) have maintained an average of nearly 12 million pounds the first six months of 1955. Cold weather will stimulate sales and create a steady market.

CANNED TUNA: Production slowed by cannery labor disputes, but inventories still high in October. National Tuna Week, November 3-12 will help promote sales.

SARDINES: Maine sardine pack lowest since 1938, so prices will increase. Pacific sardines had just appeared along the California coast as the quarter started, but a cannery labor dispute and marketing difficulties will keep pack short.

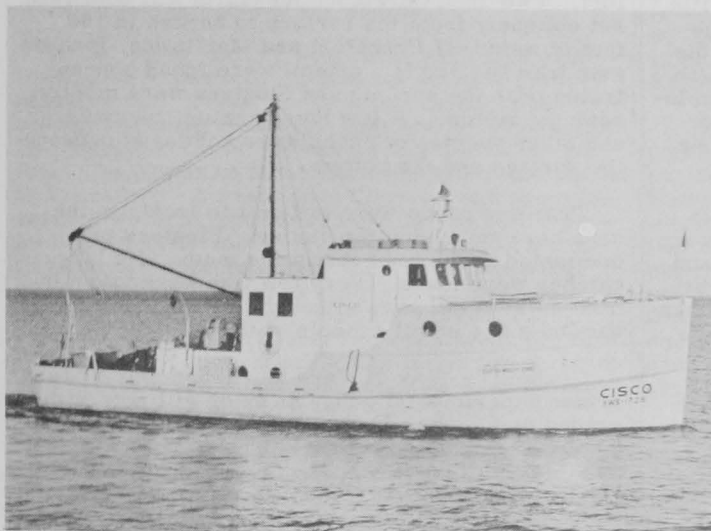
**SHRIMP:** Maximum production is expected in the Gulf area, where over 90 percent of all fresh shrimp are landed. Prices are expected to decline moderately.

**OYSTERS:** The main production season occurs this quarter. The greatest problem will be supplying demand. Prices will be firm.



## Great Lakes Fishery Investigations

**FISHERY CONDITIONS IN NORTHERN LAKE MICHIGAN EXPLORED BY "CISCO"** (Cruises III, IV, V, VI): To explore fishery and limnological conditions in northern Lake Michigan, the Service's Great Lakes Fishery Investigations scheduled a series of cruises with the research vessel Cisco during the balance of this year and the early part of 1956.



The Service's research vessel Cisco.

This work closely parallels studies conducted in southern Lake Michigan from May 1954 (Cruise I, 1954) until March 1955 (Cruise II, 1955), and completes the fishery and limnological survey of Lake Michigan.

Preliminary analysis of the data collected in southern Lake Michigan emphasizes that a major change has taken place in the fish population of the lake between the pre-sea lamprey period (1930-31) and the present period of lamprey abundance. Comparison of catches in gill nets of identical specifications fished in 1930-31 and again in 1954 in southern Lake Michigan clearly demonstrate that the

once abundant lake trout, a favored food item of the sea lamprey, is now virtually extinct. The seven species of chubs that inhabited the deep cold waters of Lake Michigan with the lake trout show a mixed reaction to the presence of the lamprey in the lake. Although the lake trout must have fed heavily on small chubs of all species, the slow-growing bloater (Leucichthys hoyi), which is characteristically small at advanced ages, probably served as the major food supply of the lake trout. With the lake trout gone the bloater is relieved of predation. Because of its small size, it is not utilized by the commercial fishery or the sea lamprey. As would be expected under such circumstances, the bloater has become much more abundant. Rough analysis of data shows that the abundance of bloaters has increased about 400 percent between the 1930-31 period and 1954.

The two species of chubs that attain the largest size (L. johannae and L. nigripinnis) were common in the nets fished in 1930-31 but virtually absent in nets fished during 1954. Their pronounced decrease in abundance between pre- and post-sea lamprey periods is not difficult to explain. These large chubs probably serve as a major food item of the sea lamprey. They also have been sought actively by fishermen because they have a higher commercial value than all other chubs. The four remaining species of chubs (L. reighardi, L. kiyi, L. zenithicus, L. alpenae) are intermediate in size and probably now serve as the basic source of food for the sea lamprey. They are the only abundant species of fish inhabiting the cool deep-water portion of the lake where the lamprey undergoes its major growth. These chubs also make up practically the entire present commercial chub catch which has

increased from about 2 million pounds in early 1940's to over 11 million pounds in 1953. As would be expected under these conditions, comparisons between 1930-31 and 1954 show that these species are now about  $\frac{1}{2}$  to  $\frac{1}{6}$  their former abundance. The 1954 catches of all species of chubs contained smaller percentages of large fish than the 1930-31 catches due to the preference of the sea lamprey and the commercial fishery for larger fish.

Invertebrate food that was formerly utilized by small lake trout and the greater numbers of intermediate and large species of chubs has been more than enough to sustain the greatly increased bloater population. Length-weight records show that chubs in 1954 were heavier than chubs of the same length in 1930-31.

Cruise III--May 10-22, 1955: Studies initiated in northern Lake Michigan with this cruise are designed to provide more data for comparing chub populations of pre- and post-lamprey periods. However, the collection of information on the little known early life history of chubs will be emphasized. Studies of the species composition and distribution of the chub populations of Lake Michigan will continue. Use will be made of bottom and mid-water trawls as a means of collecting chubs for population and biological studies, and as methods of harvesting chubs in commercial quantities.

Hydrographic work initiated in southern Lake Michigan in 1954 has provided a vast fund of information on the physical and chemical structure and characteristics of the Lake. The collection of hydrographic data in the northern section of the Lake is designed to provide a general picture of conditions for the entire Lake.

Hydrographic transects were made during this cruise between Manitowoc, Wis., and Ludington, Mich., and between Sturgeon Bay, Wis., and Frankfort, Mich.

Bathythermograph records show that water in the open lake is nearly homothermous from surface to bottom and that a slight temperature gradient occurs near shore. Surface temperatures averaged about 39° F. and ranged from 37.9° to 48.7° F.

The reply cards enclosed in drift bottles being used ask the finder if a metal drag was attached to the bottle when found. Early returns of drift bottles reveal that about one half of them lost their drags before being found even though the bottles were only out a few days. The card also has a space for the finder to make comments. Remarks in this space indicate that most of the bottle without drags have a ring of wire remaining around the neck of the bottle. This would indicate that the movements of the bottle caused the wire, which was rigidly attached to the neck of the bottle, to break at that point. Returns from drift bottles with sand ballast and without drags are falling behind returns from bottles with drags. Comments from the finders give a clue to the reason for this difference as they indicate that the heavier bottles with sand ballast are more frequently partly buried in the beach than are the bottles with drags which are relieved of their added weight (drag and wire) upon being washed onto the beach.

Experimental nylon gill nets (2 $\frac{1}{4}$ -3", stretched measure) were set off Frankfort at four depths (25, 50, 80, and 130 fathoms) and at two depths (25 and 50 fathoms) off Sturgeon Bay. Few chubs

were taken in the gill nets set off Sturgeon Bay and in the 130-fathom set off Frankfort. Good catches of spawning chub (L. reighardi) were made in the 25-, 50-, and 80-fathom sets off Frankfort. Two-inch (stretched measure) gill nets were set obliquely from the surface to bottom in 160 feet of water off Frankfort and Manitowoc. In these sets lake herring (L. artedi) were found concentrated near the surface and bloaters were mostly near the bottom. A few lake herring, bloaters, and other species of chubs were scattered between the surface and the bottom.

Trawling areas were difficult to locate in the area covered during the cruise. Bloaters predominated in the tows that were made. No large catches were made. Very few fish were taken in mid-water trawl tows although fathometer tracings showed a few small schools of fish.

Cruise IV--May 31-June 12, 1955: During this cruise experimental gangs of nylon gill nets with graded mesh sizes from 2 to 4 inches were set in 50 and 80 fathoms off Frankfort, at 25 to 50 fathoms off both Charlevoix and Manistique, and at 100 fathoms in Grand Traverse Bay. Bloaters (Leucichthys hoyi) dominated the catch from sets in 25 and 50 fathoms, and were well represented in catches from nets in deeper sets. L. reighardi was the second most abundant chub taken in gill nets during this cruise. The reighardi were mostly in spawning or spent condition. Some L. kiyi and two of the now scarce L. nigripinnis were taken in deeper sets. Catches of L. alpenae and L. zenithicus, which together make up the bulk of the commercial chub catch in southern Lake Michigan, are exceedingly light in the northern portion of the lake. Bloaters which are a nuisance to the commercial fishery in the southern end of the lake because of their small size are larger in the northern section, yet they are the most abundant chub in both parts of the lake.

One lake trout was taken in the experimental gill nets fished at 25 fathoms off Charlevoix. This fish was 4 years old and is probably a member of the last year-class of lake trout that hatched in Lake Michigan.

Nylon gill nets (2-inch mesh) were set obliquely from the surface to the bottom in 160 feet of water off Frankfort and Charlevoix. The heaviest concentration of chubs was within 4 or 5 fathoms of the bottom where L. hoyi and L. reighardi dominated the catch. A few bloaters were scattered from the bottom to the surface. Some lake herring were taken within the upper 60 feet and a few perch in the upper 40 feet of water.

Tows with bottom trawls were made at several depths off Frankfort, Charlevoix, and Manistique, and in Grand Traverse Bay. Chub catches varied from light to heavy and were primarily composed of bloaters. These bloaters are of a much larger average size than those taken in trawls in the southern portion of the lake in 1954. Five small alewives were taken in trawls towed near Charlevoix. This species is just now entering and becoming established in Lake Michigan. Of particular interest was a catch of a yellow perch and two crawfish in a trawl towed at 100 fathoms in Grand Traverse Bay.

Mid-water trawling was carried out during daylight hours off Charlevoix and in both afternoon and evening off Frankfort. No fish were taken in tows near the surface or at mid-depths. Cottids and chubs were taken in fair numbers in tows made within a few fathoms of the bottom.

A few coregonid fry with yolk sacks still protruding were taken in surface tows with a  $\frac{1}{2}$  meter plankton net. These are probably young of the spring-spawning chubs (*L. hoyi* and *L. reighardi*). Hydrographic transects were made across the lake from Charlevoix to Manistique and from Manistique to Frankfort. A resistance thermograph recorded surface water temperatures during the entire period that the boat was on the lake. Thermal stratification is complete except for a few deep-water areas where the water is nearly homothermous from surface to bottom. Surface temperatures ranged from 39.4° F. over the deep areas of the lake to 68° F. near shore. The latter temperature was near a river mouth and probably does not represent a true temperature for lake water.

**Cruise V--June 21-July 2, 1955:** This cruise nearly duplicated operations of Cruise III (May 10-22) of this year in order to measure changes in lake conditions and fish populations between the two periods.

Experimental nylon gill nets were set on the bottom of Lake Michigan at 25, 50, 80, and 135 fathoms off Frankfort and at 25 and 50 fathoms off Sturgeon Bay. There was no pronounced change between Cruises III and V in the quantity of chubs taken in gill nets. Bloaters (*Leucichthys hoyi*) continued to dominate the catch. Most conspicuous change in species composition of the chub catch has been a sharp reduction in the number of *L. reighardi*. The reduction can probably be associated with the termination of the spawning period of the species between the two cruises and the resultant lessened activity which is essential for gill-net entanglement. *L. kiyi* replaced *L. hoyi* as the second most important contributor to the chub catch during this cruise. Chub catches continued to be lighter off Sturgeon Bay than at corresponding depths off Frankfort. The nets set at 135 fathoms took fewest chubs, but in spite of the small catch, six species of chubs were represented.

Gill nets were set obliquely from surface to bottom in 160 feet of water off Ludington and Frankfort. Chubs were taken from the bottom up to within 20 feet of the surface but with the greatest concentration in the bottom 20 feet. Lake herring

(*L. artedi*) were taken in the zone from the surface down to 80 feet with the greatest concentration between 40 and 60 feet in the thermo-clinal region. A few yellow perch were taken within 40 feet of the surface.

Bottom-trawling hauls were made between Sturgeon Bay and Manitowoc, and between Ludington and Frankfort. Most catches were of moderate size and made up primarily of cottids and chubs. Of the chubs, the bloaters were most abundant. Trawl catches on the east shore tended to run larger than on the west shore.

Hydrographic transects were made across Lake Michigan from Frankfort to Sturgeon Bay and from Manitowoc to Ludington. Temperature records obtained during the cruise show that surface temperatures ranged from 49.8° to 68.9° F. The lake is well stratified and the epilimnion is less than 60 feet thick in most cases. Surface temperatures in the same area during Cruise III ranged from 37.9°-48.7° F.

**Cruise VI--July 12-25, 1955:** The primary purpose of this cruise was to collect data for a comparison of present chub population of northern Lake Michigan with what existed there in 1932. Experimental linen gill nets made to the same specification as those fished by the research vessel *Fulmar* were fished at three stations between Charlevoix and Manistique where the *Fulmar* fished these nets. Data collected from fish taken in these nets should show what changes, if any, have taken place in the chub populations since the sea lamprey became abundant in the lake during the 1940's.

Otter trawls were towed on the bottom at several depths southeast of Beaver Island. Shallow-water catches contained large numbers of 9-spine sticklebacks (*Pungitius pungitius*) and troutperch (*Percopsis omiscomaycus*). A large catch of bloaters (*Leucichthys hoyi*) was made at 45-50 fathoms. In general all catches were smaller than in other parts of the lake at similar depths. Perhaps the smaller catches can be attributed to the exceptionally clear water of this area. A secchi disc could be seen near shore to depths of 55 feet whereas, in other sections of the lake, it can be seen at depths no greater than about 20 feet when close to shore.

A hydrographic transect was made across northern Lake Michigan between Charlevoix and Manistique. Surface temperatures usually ranged between 70°-75° F., but near the end of the cruise strong northerly winds brought about an area of upwelling near the Frankfort region and the surface temperature fell from 73.4° F. to 42.8° F.

A special study was made in Lake Charlevoix, a relatively large lake connected to Lake Michigan by a narrow channel. Nansen bottle and bathermograph casts were made at one station, and several tows were made with plankton nets and trawls. Perch and smelt fry made up the bulk of the trawl catches. *Mysis* is apparently not present in the lake although existing conditions seemed to be favorable for this species.



## Great Lakes

**LAKE TROUT CATCH ON LAKES HURON, MICHIGAN, AND SUPERIOR, 1949-53:** The catch of lake trout in Lake Michigan had dropped to zero by 1953 and that for Lake Huron was only 6.7 percent of normal. This sharp decline is attributed to sea lamprey depredations. Lake Superior was the only one of the Great Lakes to yield appreciable quantities of lake trout.

The table gives the lake trout production for the 1949-53 period.

Lake Trout in the Upper Great Lakes, 1949-1953, and Modern "Normal" Production in the Various Waters						
Lake and State or Province	Catch <sup>1/</sup>					Modern Normal Production <sup>2/</sup>
	1949	1950	1951	1952	1953	
	(1,000 Pounds)					
Lake Huron:						
Michigan . . . . .	1	-	-	-	-	1,685
Ontario <sup>3/</sup> . . . . .	399	416	553	588	344	3,596
Total . . . . .	400	416	553	588	344	5,281
Lake Michigan:						
Michigan . . . . .	223	25	2	-	-	2,525
Wisconsin . . . . .	115	25	7	3	-	2,542
Illinois . . . . .	4	4	2	-	-	457
Indiana . . . . .	-	-	-	-	-	126
Total . . . . .	342	54	11	3	-	5,650
Lake Superior:						
Michigan . . . . .	2,181	2,400	2,174	2,074	1,746	2,180
Wisconsin . . . . .	514	591	504	521	450	533
Minnesota . . . . .	270	202	233	243	217	336
All U. S. waters . . . . .	2,965	3,193	2,911	2,838	2,413	3,049
Ontario . . . . .	1,356	1,506	1,273	1,389	1,371	1,395
All waters . . . . .	4,321	4,699	4,184	4,227	3,784	4,444

<sup>1/</sup> Catch of less than 1,000 pounds omitted.

<sup>2/</sup> Years on which normal catches are based; Canadian waters of Lake Huron, 1923-1939; U. S. waters of Lake Huron, 1895-1939; Lake Michigan, 1927-1944; Canadian waters of Lake Superior, 1930-1949; U. S. waters of Lake Superior, 1926-1949.

<sup>3/</sup> Includes Huron proper.



## Gulf Exploratory Fishery Program

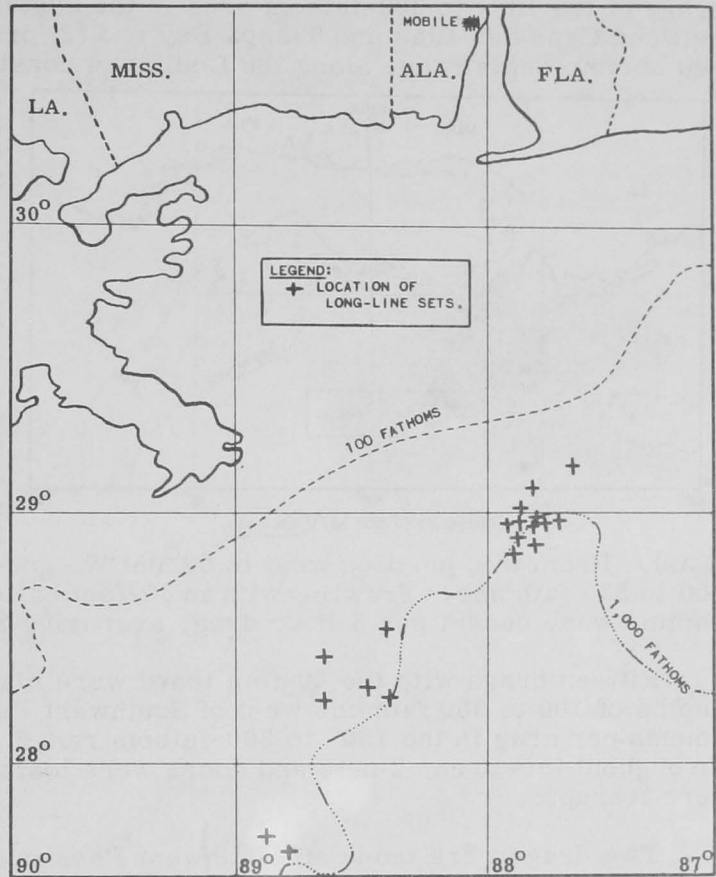
**CAPACITY TRIP OF TUNA LANDED BY "OREGON" (Cruise 33):** A total of 652 yellowfin tuna (weighing 59,000 pounds) were caught by the Service's exploratory fishing vessel Oregon during an 18-day commercial-scale tuna long-line trip in the north central Gulf of Mexico, which ended August 27. The fish ranged in weight from 7 to 215 pounds each, with an average of approximately 90 pounds. Of the fish caught, 19 percent were shark damaged. The remaining whole yellowfin weighed 45,665 pounds.

During the 14 fishing days, 19 sets were made. Except when unfavorable sea conditions were encountered, approximately 100 baskets of gear were run each day, either as one continuous set, or two 50-basket sets (12,870 hooks were set for the cruise). The gear was normally set with half 10-fathom float lines and half 20-fathom float lines. A variety of bait species were used on most sets, including small mullet, cigarfish (*Decapterus*), balio, and herring. There was no apparent bait preference.

Catch rates on individual sets ranged from 1.7 to 11.2 yellowfin per 100 hooks and averaged 5.06 yellowfin per 100 hooks. In addition, 27 blackfin tuna, 8 Katsuwonus, 78 white marlin, 1 blue marlin, 10 sailfish, 2 small swordfish, and 178 sharks were landed on the long lines. Sixteen of the white marlin were tagged and released in cooperation with the Woods Hole Oceanographic Institution and an additional 99 sharks were shot during the trip.

Fishing activities were carried out in two general areas. During the first half of the cruise all sets were made approximately 90 miles south of Mobile Bay. After seven days in this area the Oregon's brine-freezing tank was filled to capacity (14 tons) and the vessel returned to Pascagoula to unload.

During the last half of the cruise a few sets were made in the same area before the Oregon moved to an area SSE. of the Mississippi Delta and worked between the 600- and 1,000-fathom curves. The largest single catch was made south of Mobile where 88 yellowfin were taken on 104 baskets. The best single catch rate was south southeast of the Mississippi Delta where 56 yellowfin were caught on a 50-basket set for an average of 11.2 fish per 100 hooks.



Cruise 33 of exploratory fishing vessel Oregon, Aug. 9-Aug. 27, 1955.

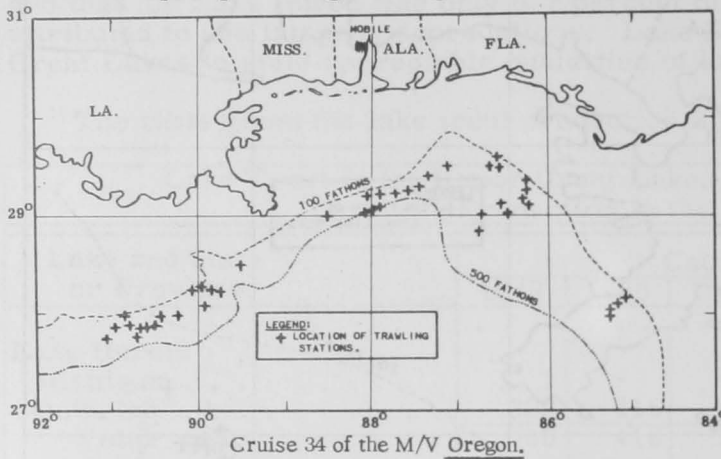
Stomach analyses, sex determinations, and body measurements were obtained for the catch. Bathythermograph casts were made at each end of the line. Plankton samples were obtained on each run between stations. Night light dip-netting produced large series of post-larvae and juvenile tunas, sailfish, and one 20-inch swordfish. Large schools of mixed blackfin, Katsuwonus, and yellowfin tuna were observed during the cruise. Three 50-pound yellowfins were caught on handlines.

Exploratory fishing for red shrimp (Hymenopendaeus robustus) in the deep waters of the north central and northeastern parts of the Gulf of Mexico will be the objective of the Oregon during a trip scheduled to leave Pascagoula September 6 (Cruise 34). Additional information will be sought on the seasonal distribution of potentially-valuable red shrimp stocks in this area and the known depth ranges of this species.

Major trawling emphasis will be centered between Cape San Blas and Tampa Bay in depths of 150 to 300 fathoms, and along the Louisiana Coast in the same depth range.

\* \* \* \* \*

**DEEP-WATER SHRIMP TRAWLING TRIP COMPLETED BY "OREGON"** (Cruise 34): The basic objectives of this trip were to obtain (1) additional exploratory coverage of the 100- to 300-fathom area in the eastern and north-central Gulf of Mexico between Cape San Blas and Tampa Bay and (2) preliminary trawling coverage of the red shrimp depth range along the Louisiana coast west of the Mississippi Delta.



Cruise 34 of the M/V Oregon.

The Oregon completed the second part of this 3-week deep-water shrimp trawling trip on September 26.

Sixteen drags using a 40-foot trawl were made in 125 to 275 fathoms along the Florida coast between 87° west longitude and 28° north latitude. Catches of red shrimp throughout this area were small (1 to 14 pounds per 2-hour tow). No indications of commercial concentrations were located south of 29°30' N. and 87°08' W. (210 fathoms west of Cape San

Blas). From this position west to 88°05' W. good catches were made in depths of 200 to 225 fathoms. Trawling with an 80-foot balloon net, 150 to 295 pounds of red shrimp were caught per 3-hour drag, averaging 225 pounds per drag.

Fifteen drags with the 40-foot trawl were made along the Louisiana coast in depths of 100 to 300 fathoms west of Southwest Pass. Catches ranged from 6 to 13 pounds per drag in the 150- to 300-fathom range. Due to poor trawling bottom throughout this area, 2 nets and doors were lost and 3 other drags resulted in severe tearups.

Two drags were made off Southwest Pass in depths of 55 to 65 fathoms to obtain silver porgies (Stenotomus caprinus) for future trials as tuna long-line bait. A total of 250 pounds of 8-10 to the pound porgies were frozen. Ten pounds of very large (3-5 heads-on to the pound) brown-grooved shrimp were also taken in each catch.

Large numbers of schooling blackfin tuna and skipjack (Katsuwonus pelamis) were observed throughout the areas worked. Night-light collecting yielded several hundred juvenile skipjack.



## Maine

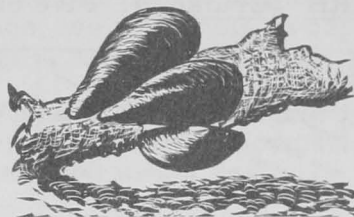
**CANNED MAINE SARDINE PACK, SEPT. 10:** The total pack of canned Maine sardines to September 10, 1955, was 828,181 actual cases--considerably less than for the same period in 1954. (See graph on chart 6 of this issue.) Fish supply was still very spotty, reports the Maine Sardine Industry.



## Fresh-Water Mussel Research Program

The research program to improve the domestic mussel-shell button industry will include life-history studies of the two most important species, the heavy shell "pig toe" and "niggerhead" mussels. These two mussel varieties are of the greatest importance to the United States button industry.

Present plans of the U. S. Fish and Wildlife Service include (1) a survey of the TVA area of the Tennessee River to determine the shell potential, particularly as applied to juvenile populations; (2) a study of the effect of siltation in the TVA system on the mussel populations, particularly on the juvenile sizes; (3) a survey to locate new mussel beds; (4) a study of regulations on the harvesting of mussels; (5) a study of the possibility of improving present fishing gear and other methods of shell harvest; (6) and a study of the possibility of transplanting desirable heavy-shell mussels to areas where desirable populations do not now exist but where the biological conditions might permit the establishment of such populations.



Fresh-water mussel.

Most of the mussel shells taken in this country for manufacture into fresh-water pearl buttons have been produced in waters of the Mississippi River basin, especially in areas of the Tennessee River. Thus, during 1954, Tennessee accounted for 30 percent of the total take of mussel shells; Alabama, 20 percent; Arkansas, 18 percent; Kentucky, 13 percent; Indiana, 11 percent; Illinois, 7 percent; and Iowa--center of manufacture--only 1 percent.

At this time there is no demand for shells taken from the northern rivers outside the Mississippi River basin. The principal species taken from these waters is the mucket or "pocket book" mussel, the shell of which is less suitable for the type of button now desired.

The competition from plastic materials and imported marine pearl shells has given the domestic mussel-shell industry a difficult time in recent years. During 1954, the industry produced 4.3 million gross of buttons, valued at \$4,800,000, and 3,155 tons of lime and poultry grit, valued at \$22,000. The value of manufactured items produced from fresh-water mussel shells averaged \$4,900,000 in the last 3 years, whereas during the period 1936-38 this value averaged \$4,100,000. Nevertheless, this gain in value has been due entirely to the increase in prices for buttons, as the quantity produced has declined substantially during the period.



## North Atlantic Fisheries Investigations

SURVEY OF GEORGES BANK AND SOUTHERN NEW ENGLAND BANKS BY "ALBATROSS III" (Cruise 66): A seven-day cruise (completed September 28) designed to study: (1) the distribution of zero-ring haddock (less than one year old) in connection with the early life-history and year-class strength studies; (2) the distribution and numbers of older bottom fish; and (3) the whiting fishery.

During the cruise, 56 one-half hour drags with a No. 36 trawl net, 57 bathythermograph lowerings, and 27 surface one-meter net tows were made. Due to the very few zero-ring haddock found on the above banks, a poor survival of spawn is indicated. Juvenile whiting were found at most stations. Scattered concentrations of juvenile hake, butterfish, and scup were also found at six stations. Intensive sampling of whiting for racial studies was undertaken at six stations.

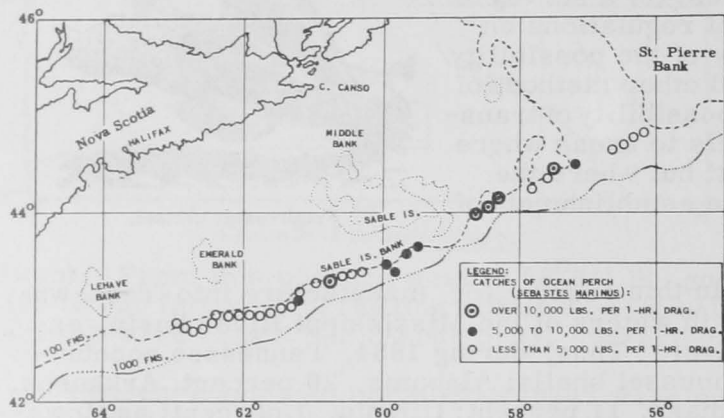


Estimates of the 1955 year-class of Georges and Browns Bank haddock will be made by correlating the distribution and drift of eggs during the spring and the distribution of zero-ring haddock during the fall.



## North Atlantic Fisheries Exploration and Gear Research

### GOOD CATCHES OF LARGE OCEAN PERCH IN DEEP WATER BY "DELAWARE" (Cruise 9): Five catches of ocean perch (*Sebastes marinus*) greater than



The Service's exploratory fishing vessel Delaware made good catches of large ocean perch at depths greater than ordinarily fished by New England trawlers.

The cruise, which began on September 15, was one of a series designed to explore the groundfish resources at the edge of the continental shelf in waters deeper than are ordinarily fished by New England trawlers. The vessel fished in depths between 100-500 fathoms. The gear fished consisted of a standard No. 41 trawl and a No. 41 balloon trawl.

The vessel departed on September 26 for a 12-day cruise to study the rate at which groundfish catches can be brine-frozen under commercial operating conditions.



## Maine Herring Exploration and Gear Research

"THEODORE N. GILL" SEARCHES FOR SCHOOLS OF LARGE HERRING (Cruise 5): An intensive search for schools of large spawning herring was carried on during Cruise No. 5 in order to determine whether different races of herring live in the Gulf of Maine. The U. S. Fish and Wildlife Service research vessel Theodore N. Gill traversed the Maine coast, between Cape Small and Eastport, the islands of Campobello and Grand Manan in New Brunswick, and areas along Nova Scotia between Digby and Yarmouth. The vessel left Boothbay Harbor August 16 and returned August 26, 1955.

No schools of spawning fish were observed along the Maine coast in the localities where herring have been known to congregate and spawn in the past. The region around the islands of Damariscove, Monhegan, Matinicus, Mount Desert Rock, Petit Manan, Libby, and Cross were searched thoroughly with echo-sounding devices, but the results were negative. Mackerel seiners operating off the western and central parts of the Maine coast report a similar scarcity of large fish.

During this cruise, only one gill-net set was made, because it had been decided to put the nets out only when fish schools were discovered. In the evening of August 17, we set the five gill nets on a school of fish three miles off Matinicus Rock. Several hundred pounds of large whiting, a mackerel, a white hake, and several alewives and bluebacks was the total catch.

Small fish were plentiful in the few inshore Maine localities that were visited, and a great school of brit was discovered by echo-sounding along the western side of Campobello Island, N. B., on August 21. During the night these fish were located from a depth of 50 feet to the surface. The school was about six miles long. A lampara-seine set was made on these fish during the late morning of August 22. Since most of the fish had then descended from the surface, we were able to capture only a few hundred small fish, less than four inches long.

Through the active cooperation of scientists of the Fishery Research Board of Canada, we were able to obtain samples of spawning herring in the Yarmouth (Nova Scotia) area. These fish were being taken by both gill nets and weirs.



## North Atlantic Herring Research

HERRING SUPPLY FORECASTS FORESEEN: United States and Canadian fishery biologists, on September 29, told sardine packers of both countries that they hoped to perfect a system for making accurate long-range forecasts of the Gulf of Maine herring supply.

This prediction highlighted a September meeting of 75 Maine and Canadian packers and their representatives, held at Hinkley Point, Me., during which the experts brought the packers up to date on the large-scale herring research programs being conducted and financed by the United States and Canadian governments.

It was especially timely in view of a drastic fish shortage which is holding sardine production to one of the lowest levels in history this year. A similar situation existed in both 1951 and 1953, states a September 29 news release from The Maine Sardine Industry.

The discussions were lead by Drs. Lionel Walford, Chief Fishery Biologist of the U. S. Fish and Wildlife Service, Washington, D. C., and J. L. Hart, Director Atlantic Biological Station, St. Andrews, N. B. Both agreed that their organizations were getting at the heart of the herring problem and that the findings should become progressively valuable to packers and fishermen in the future. The biologists stated that no definite conclusions as to the cause of the present fish shortage have been reached but data is being collected that may tell the story in a year or two.

The research programs of both countries are being closely coordinated and a spirit of complete cooperation exists in the double-barrel attack on the problem.

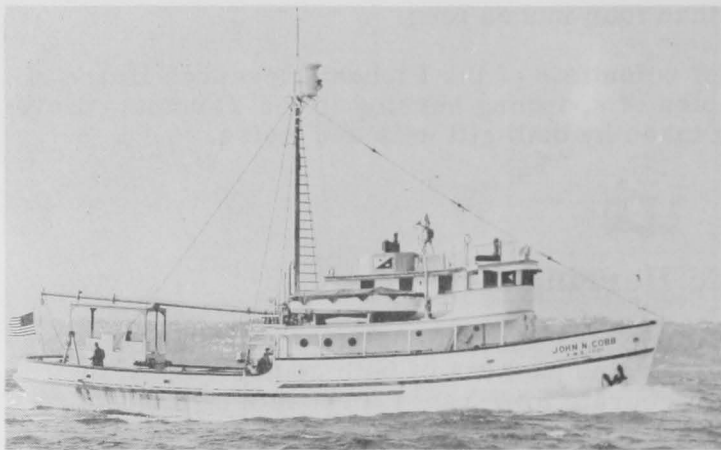
The packers agreed that accurate long-range forecasting of the fish supplies that would be available from year to year would be of inestimable value to the industry.



## North Pacific Exploratory Fishery Program

**SALMON CAUGHT IN GULF OF ALASKA BY "JOHN N. COBB" (Cruise 28):** Salmon were caught at every station fished by the Service's exploratory vessel John N. Cobb in the offshore waters of the Gulf of Alaska and adjacent areas of the North Pacific. A total of 50 gill-net sets showed that salmon were widely distributed on the high seas from off northern Vancouver Island to Dutch Harbor, Alaska, during the 12-weeks cruise that began on June 23 and ended September 18, 1955.

Results of the exploratory fishing yielded valuable new information on the off-shore distribution, abundance, and availability of salmon to certain types of gear.



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

All fishing was carried out from 50 to 300 miles offshore, and a few stations were fished a second time after an interval of about two months to compare catch results at different times. All five species of Pacific salmon were caught in a number of the gill-net sets, other sets produced from 1 to 4 species. Chum salmon were most abundant in the over-all catch, with king salmon least numerous.

The majority of the salmon were of good size, apparently adult spawning stock. Smaller fish representing later year-classes were taken in the smaller mesh nets designed to sample immature salmon feeding in the area.

The gill-net catch for the 50 sets was 2,484 salmon, an average of 49 salmon per set and included 1,248 chum, 639 pink, 367 red, 211 silver, and 19 king salmon. Individual catches ranged from 1 to 168 salmon. The gill nets also caught 55 steelhead trout and various numbers of pomfret, scad, mackerel shark, and a few ragfish. Salmon trolling gear fished for 28 hours in the vicinity of 5 gill-net stations caught 22 fish--18 silver, 3 pink, and 1 king salmon.

The nylon gill nets designed to fish from the surface to about 20 feet deep, were made up in 50-fathom shackles, with mesh sizes from  $3\frac{1}{4}$ " to 6" stretched measure. Most sets were made at night, setting in the evening and hauling back shortly after daybreak. The three daytime sets caught salmon, but the catches were less than those taken in the same places at night.

On most sets, either 20 shackles (1,000 fathoms) or 30 shackles (1,500 fathoms) of gill net were set. Smaller amounts of gear were used early in the trip and during poor weather on several sets.

Weather conditions, in general, were favorable for surface gill-netting during most of the cruise. Only a few fishing days were lost because of adverse weather up to the end of August. But from August 30 to mid-September a series of storms seriously cut down fishing time.

Over 2,000 frozen salmon were returned to Seattle for racial studies and 330 were tagged at sea and released. In addition, blood samples from 45 red salmon were preserved for an experiment on the identification of races of fish through blood characteristics.

Oceanographic data, including surface and subsurface water samples, plankton hauls, and bathythermograph records, were obtained at each fishing station.

The cruise was part of the high-seas salmon research program approved by the International North Pacific Fisheries Commission.

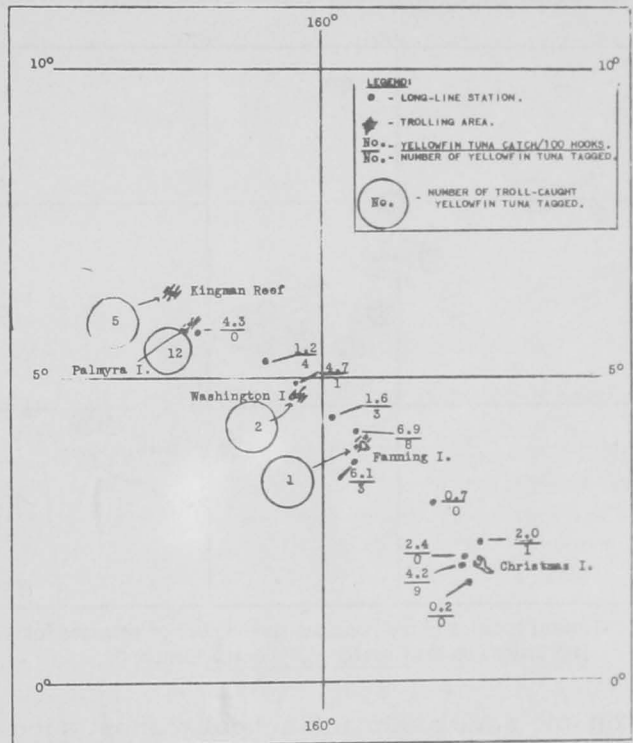


### Pacific Oceanic Fishery Investigations

**GOOD YELLOWFIN TUNA CATCHES NEAR EQUATOR BY "COMMONWEALTH"**  
 (Cruise 4): Good catches of yellowfin tuna near Fanning Island, were made by the Commonwealth, a fishing vessel under charter to the U. S. Fish and Wildlife Service's Pacific Oceanic Fisheries Investigations. The ship returned to Honolulu on August 16 after a six-weeks cruise to the Line Islands. This was the third cruise in a series which will extend throughout 1955 to study changes in the seasonal abundance of tuna in the equatorial region.

During 105 hours of scouting close to shore around the Line Islands, only 43 bird flocks were sighted. In general these flocks were small and tended to disperse quickly when the vessel approached, as though the fish had sounded. A few were identified as accompanying skipjack tuna schools.

Trolling close to shore in the areas shown on the chart for 105 hours netted only 24 yellowfin. Six lines were fished simultaneously during this time. This low catch rate, which is about 0.2 yellowfin per hour, is the lowest for the three cruises on which trolling was done in 1955. Eighty-three wahoo were captured incidentally during trolling.



Cruise 4 of M/V Commonwealth chartered by the Service's Pacific Oceanic Fisheries Investigations.

An average of 35 11-hook baskets per day was fished on 11 long-line stations from July 15 to August 8. The range of catches of these stations (which began at Christmas Island and terminated at Palmyra Island--see chart) was from 0.2 to 6.9 yellowfin per 100 hooks. The lowest catch rate was made at Christmas Island and the two highest (6.1 and 6.9 yellowfin per 100 hooks) at Fanning Island. The average catch rate for all stations was 3.1 yellowfin per 100 hooks. A total of 135 sharks, nearly all of which were brown sharks were captured. Of the 137 yellowfin captured, 33 (24 percent) were shark damaged. One special long-line station at which only three baskets were set was occupied at the east end of Palmyra Island reef. This set which was anchored to the reef caught only 1 yellowfin and 20 brown sharks (61 sharks per 100 hooks).

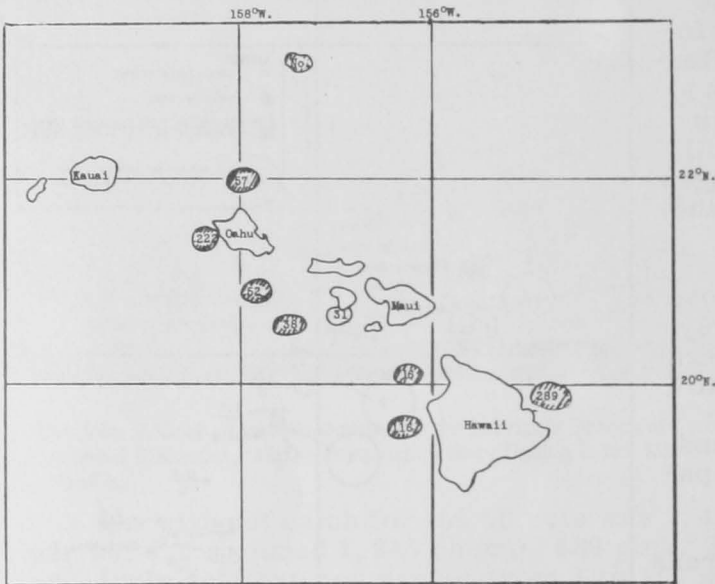
The weather as a whole during the cruise was fair but with prolonged rain showers in the vicinity of Palmyra Island. No fishing time was lost due to bad weather.

In addition to determining abundance of yellowfin tuna, a tagging program is being used to study possible migration of this species. Approximately 700 yellowfin tuna have been tagged in the equatorial area but to date no recoveries have been made.

A site has been located at Christmas Island for a submerged recording sea thermometer and a dummy instrument was installed to test the anchor system. When the thermometer is installed it will maintain a six-months' record of sea temperatures and may help to explain the fluctuations in tuna abundance.

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**SKIPJACK TAGGING CRUISE BY "CHARLES H. GILBERT" (Cruise 22):** A total of 821 skipjack tuna were tagged with the California-type ("G") plastic-tube tag by the Service's research vessel Charles H. Gilbert during a six-week cruise off the Hawaiian Islands. The primary purpose of the trip (which began on July 11) was to catch and tag what is known as "seasonal skipjack" or fish larger than 12 pounds catch. Fish of this size were scarce and only 57 fish were tagged and released in this size group. In the 3 to 10-pound size class, 764 fish were tagged. Other objectives of the trip were (1) the testing of artificial baits; and (2) scouting for skipjack schools and transmitting the results to the local fleet twice daily. Surface temperature records were made throughout the area covered and subsurface temperatures were obtained when fish were caught and at other irregular intervals.



General location of tag releases and number of releases for skipjack tagged on the Charles H. Gilbert's Cruise 22.

The artificial baits were tested on one small skipjack school without success. Routine observations were made on the behavior of skipjack schools and associated bird flocks. The length, weight, sex, and stomach contents of 10 skipjacks from each school were obtained and all untagged skipjack tuna were measured.

On August 17 a total of 80 skipjack of  $3\frac{1}{2}$  to 4 pounds size were obtained and processed for honeycombing tests.

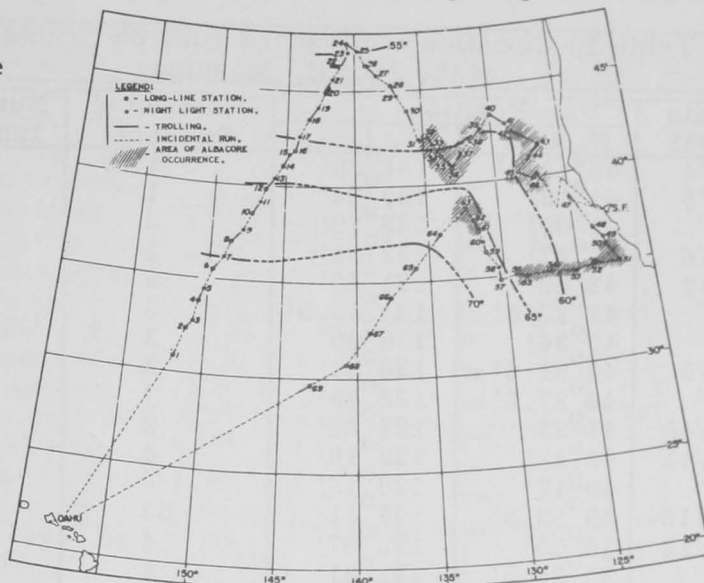
Various lures were used on four trolling lines for catching skipjack and 16 fish were caught.

\* \* \* \* \*

**NEW ALBACORE GROUNDS LOCATED BY "JOHN R. MANNING" (Cruise 26):** Albacore tuna were located as much as 800 miles north of the grounds where the United States commercial vessels fish, according to a report of a 6,000-mile exploratory albacore fishing cruise to the United States west coast and back. This cruise was made by the Service's fishery research vessel John R. Manning. The principal purpose of the cruise was to study the distribution and abundance of the albacore tuna throughout the vast stretch of open ocean east of Hawaii and on into the coastal waters of California, where a United States fishery for this species is

in full swing in the late summer. In addition to the open ocean distribution, the immediate coastal distribution during the summer fishery was also investigated.

Little is known of the occurrence of albacore in the open sea between Hawaii and the United States west coast, but it is believed that there may be possibilities for the development of commercial fishing grounds there. The Japanese have long fished albacore at the same latitudes farther west, and albacore tagged on the California coast have been recaptured in this Japanese fishery, presumably having passed northwest of Hawaii in their migrations. The present fishery on the American coast is very restricted in the duration of its season and the extent of its grounds. The aim of exploratory fishing is to aid the expansion of the fishery by finding schools of albacore earlier or later than the extremes of the present fishing season or outside the geographical limits of present operations.



Cruise 26 of the John R. Manning, July 15-Sept. 10, 1955.

In its exploratory work the vessel employed both long-line fishing gear used by the Japanese in the northwest Pacific and the trolling technique of the United States fishery. According to the fishery research biologist in charge on the cruise, trolling was much more productive than long-lining, catching 58 albacore to the long lines' 6. The fishing done by the vessel in the coastal area was at all times several hundred miles from the center of activity of the commercial fleet, and although not highly productive, it did result in locating albacore as much as 800 miles north of the grounds where the commercial vessels were fishing.

The results of this cruise together with the results of other Fish and Wildlife Service vessels operating out of Honolulu and Seattle suggest that in addition to the albacore off the West Coast, there is, during the summer, an important concentration of fish about 1,000 miles north of Honolulu. In this area vessels surveying for salmon took large numbers of albacore in gill nets, and hydrographic vessels took them on troll lines. The existence of this latter body of fish may be important to Hawaii for they are within practicable range of Honolulu.

The John R. Manning departed Pearl Harbor, T. H., on July 15, 1955, fished northeast from  $30^{\circ}51' N.$ ,  $151^{\circ}56' W.$  to  $47^{\circ}31' N.$ ,  $140^{\circ}38'5' W.$ ; southeast to  $40^{\circ}53' N.$ ,  $133^{\circ}03' W.$ ; northeast to  $43^{\circ}25' N.$ ,  $130^{\circ}00' W.$ ; southeast to  $41^{\circ}39' N.$ ,  $126^{\circ}41' W.$ ; southwest to  $40^{\circ}17' N.$ ,  $128^{\circ}18' W.$ ; then directly to San Francisco. After refueling and reprovisioning at San Francisco between August 15 and 19, the vessel fished along the West Coast from  $38^{\circ}49' N.$ ,  $124^{\circ}57' W.$  south to  $35^{\circ}02' N.$ ,  $122^{\circ}15' W.$ ; due west along  $35^{\circ} N.$  latitude to  $130^{\circ}17' W.$  longitude; northwest to  $38^{\circ}43' N.$ ,  $132^{\circ}16' W.$ , then southwest to  $29^{\circ}41' N.$ ,  $143^{\circ}01' W.$ ; returned to Pearl Harbor on September 10, 1955.

The vessel fished 38 long-line stations. Each station consisted of a 40-basket set of 13-hook gear, 20 baskets with 5-fathom floatlines and 20 with 15-fathom floatlines, alternated in groups of 10 baskets.

A total of 6 albacore (6 to 22 pounds each) were taken on the gear at 4 stations (see table for location of albacore catch).

The total catch for all stations was: 6 albacore tuna, 24 big-eyed tuna, 5 striped marlin, 1 black marlin, 1 short-nosed spearfish, 719 great blue shark, 8

soupin shark (*Galeorhinus zyopterus*), 5 mackerel shark (*Lamna cornubica*), 3 mako shark (*Isurus glaucus*), 113 lancetfish (*Alepisaurus* sp.), 59 dolphin (*Coraephaena hippurus*), 1 wahoo, 7 bramids, 3 moonfish (*Lampris regia*), 1 Pacific jack mackerel (*Trachurus symmetricus*), and 1 *Anotopterus pharad* (?).

Table 1 - Location of Albacore Tuna on Cruise 26 of the John R. Manning

Date 1955	Position		Number of Strikes <sup>1/</sup>	Number landed
	N. Lat.	W. Long.		
8/4	42° 18.5'	134° 28'	1	1
8/5	41° 13'	133° 24'	1	1
"	41° 09'	133° 20'	3	1
8/6	41° 22'	132° 35'	3	1
8/7	42° 08'	131° 30'	9	4
"	42° 22.5'	131° 13.5'	5	3
"	42° 34'	130° 59'	3	2
8/9	42° 31.5'	128° 31'	3	0
"	42° 27.5'	128° 16'	1	0
8/10	41° 23'	127° 07'	2	0
8/11	40° 17'	128° 18'	4	<u>2/</u> 3
"	40° 17'	128° 18'	-	<u>1</u>
8/12	39° 52.5'	127° 11'	53	35
8/22	36° 05'	122° 57'	4	2
"	35° 56.5'	122° 51'	1	1
8/23	35° 02.5'	122° 15'	1	0
8/24	35° 03'	123° 47'	7	4
"	35° 02'	124° 38'	2	2
8/25	34° 52'	125° 14'	1	0
8/26	34° 58.5'	126° 48.5'	2	<u>2/</u> 1
"	34° 58.5'	126° 48.5'	-	<u>2/</u> 2
8/27	34° 55'	128° 33'	-	<u>2/</u> 1
8/30	37° 39'	131° 33'	-	<u>2/</u> 2
"	37° 47'	131° 45'	1	1
8/31	38° 43'	132° 16.5'	2	2
Totals . . . . .			109	70

<sup>1/</sup> This is the total number of identified fish hooked.  
<sup>2/</sup> These fish were taken by long line. All others were troll-caught albacore.

Intensive trolling with 6 jig lines was substituted for long-lining when weather conditions did not permit setting of the long-line gear. Five such trolling stations were conducted and albacore were taken at two of these. At 39° 52' N., 127° 11' W., in 12 hours of trolling, a total of 53 albacore strikes were recorded, of which 35 fish were landed. The fish weighed from 12 to 14 pounds each. Another trolling station at 35° 03' N., 123° 47' W. yielded 6 albacore (10-13 pounds each) out of 9 strikes in 13 hours.

Trolling was conducted along the long-line sets and during daylight hours en route to the next station. The catch from 1,311 line-hours of trolling (not including the trolling stations) was 23 albacore, 1 skipjack, 5 dolphin, and 1 short-nosed spearfish. In addition 24 albacore, 1 skipjack, and 9 dolphin were hooked but lost.

Fishing was done in waters with surface temperatures ranging from 54° to 75° F., albacore being taken between 57° and 67° F.

On August 30, at 37° 39' N., 131° 33' W., two fairly large schools of 10-inch saury were seen breaking the surface. One albacore tuna was taken on several passes through one of the schools. Although bird flocks were scarce throughout the area of operation, scattered birds were seen continuously. Sightings of whales, porpoises, and fur seals were also recorded.

A total of 63 albacore and 9 big-eyed tuna were tagged and released at widely separated points.

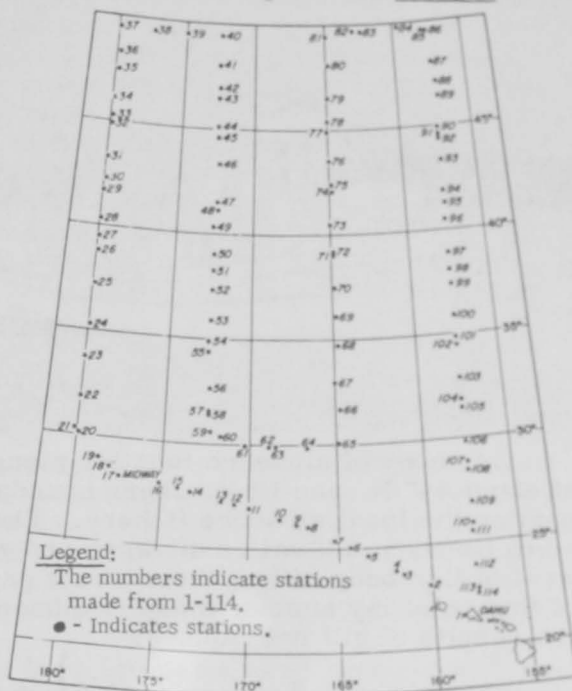
Night fishing with lights was done at 26 stations with the object of assessing the abundance of the saury, a small fish of potential value as albacore bait, but no im-

portant concentrations were discovered. Sharks of several species were found to be extremely abundant throughout the cruise. A total of 735 were taken on the long-lines, with a record day's catch of 100 sharks.

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**NORTH PACIFIC OCEANOGRAPHIC CRUISE BY "HUGH M. SMITH (Cruise 30):**

The Hugh M. Smith during a 6-week participation cruise in Operation Norpac investigated the oceanography of the North Pacific in an area between latitudes 25° N. and 50° N. and longitudes 180° and 158° W. The weather was fair throughout the cruise, except for a brief period of rough weather on the first leg (180th meridian) and fog in areas of sudden temperature drop where the North Pacific current fringed on sub-arctic waters at about 45° N. latitude. A total of 79 oceanographic stations were occupied at depths ranging from the surface to 8,000 feet. Plankton hauls were routinely made and the Isaac-Kidd trawl was operated very successfully. Surface trolling produced 7 albacore at stations in the vicinity of 45° N. latitude and 157°-172° W. longitude. The results from Norpac, a multiple-ship operation involving vessels of U. S. Fish and Wildlife Service Pacific Oceanic Fisheries Investigations, Scripps Institution of Oceanography, the University of Washington, the Pacific Oceanographic Group of Canada, and several Japanese agencies should be invaluable in furthering an understanding of North Pacific midsummer oceanographic conditions and their relationship to meteorology and the distribution of albacore and salmon.



Cruise 30 of the Hugh M. Smith (Norpac), July 15-Aug. 28, 1955.

The Hugh M. Smith left Pearl Harbor on July 15 and returned to that port on August 28.

The wheel watch maintained a careful lookout for tuna schools, bird flocks, and scattered birds and mammals.

Except for the numerous schools of flying fish in the southern part of the area, fish were sighted on only four occasions. The first was a very large unidentified school at 29° 50' N., 179° 38' W., which was accompanied by a flock of approximately 2,000 terns and shearwaters. The second was at 47° 04' N., 179° 41' W. (water temp. 51.9° F.) where salmon were sighted. The third was at approximately 35° 40' N., 172° 36' W. where a school of large fish was sighted which the leading fisherman identified as yellowfin tuna. The fourth was a large concentration of sauries centered at 46° 30' N., 157° 06' W. The vessel ran through large schools of 10- to 12-inch sauries for about two hours (18 miles).

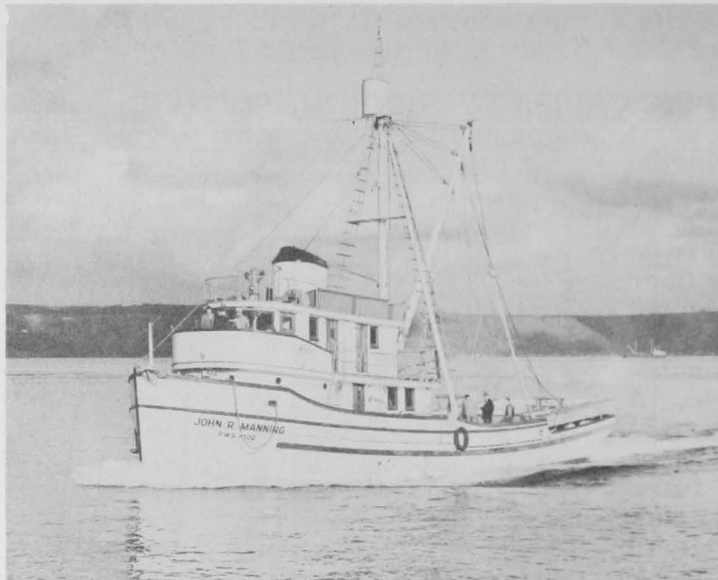
Numerous whales, mostly sperm, and porpoises were sighted.

Surface trolling was carried out during daylight hours--8 albacore tuna, 10 dolphin, and 1 skipjack tuna were caught. The albacore were taken on 172° 30' W. and 157° 30' W. transects between 46° 28' N. at a surface temperature of 58° F. and 48° 04' N. at a surface temperature of 54° F. The skipjack and mahimahi were taken in the southern part of the cruise area.

\*\*\*\*\*



TWO POPULATIONS OF ALBACORE TUNA IN NORTH PACIFIC: Superimposing the results of all organizations reveals two populations of albacore tuna in the



North Pacific separated by a wide gap apparently devoid of this species, reports the Service's Pacific Oceanic Fishery Investigations. The Service's research vessel John R. Manning completed the summer albacore survey in September 1955. This survey was conducted simultaneously with NORPAC and involved, also, the Paolina T., a vessel operated by the California Department of Fish and Game. In addition to the vessels specifically surveying albacore tuna, significant results were obtained from the hydrographic cruise of the Service's research vessel Hugh M. Smith and from vessels of the Pacific Salmon Investigations gill-netting for salmon.

One body of albacore tuna lay along the West Coast, with its northern boundary at about 44° N. and its southern boundary off southern California, where it was supporting the local albacore fishery. The northern portion of this concentration seemed to lie about 300 miles offshore and was not being utilized by the fishery. To the west of this body of fish there was a gap to 157° W., or due north of Hawaii. West of this point lay another mass of albacore, as shown by the results of trolling and the results of gill net catches.

\* \* \* \* \*

MORE TAGGED TUNA RECOVERED IN HAWAIIAN WATERS: Two more tagged skipjack tuna (aku) have been recaptured and returned through the fine efforts of the local commercial fishermen, according to the Pacific Oceanic Fishery Investigations. This brings the total recovered to four. It is hoped that tag recoveries such as these will help to explain the mysterious migrations undertaken by the skipjack tuna.

One tagged fish was caught by the sampan Neptune on July 26 off Waialeale (Kahuku), Oahu, and the other by the Olympic, on July 30 near Lanai. Both fish were tagged and released from the research vessel Charles H. Gilbert in Hawaiian waters during the past month and consequently were at liberty only a short time. One fish was out for 6 and the other for 12 days. Although no travel records were set during these periods, the information obtained from the tagged fish is of great value to the scientists in demonstrating the ability of the skipjack to withstand the tagging operation.

The fish were tagged by threading a plastic tubing through the crest of the back behind the dorsal fin, thus wounding the fish slightly. The scientists were pleased to find that neither fish showed signs of infection from this operation. In fact, the wound had already started to heal in one of the fish as shown by the growth of new skin. Over 1,200 skipjack have been tagged and released in Hawaiian waters to date.

\* \* \* \* \*

TAGGED SKIPJACK TUNA RECOVERED FROM STOMACH OF YELLOWFIN TUNA: A 189 pound yellowfin tuna with a 5 pound skipjack tuna in its stomach was caught by the commercial flag-line tuna vessel Irene C. on August 24 off Hilo. When the yellowfin's stomach was opened, it was found to contain a skipjack tuna

bearing a white plastic tag. The tag had been attached two days earlier (August 22) by scientists aboard the U. S. Fish and Wildlife Service research vessel Charles H. Gilbert, and the fish had been returned to the water alive, according to the Director of the Pacific Oceanic Fishery Investigations.

This somewhat bizarre recovery is only the eighth from a total of 1,724 skipjack tuna tagged and released in Hawaiian waters during the past year. All of the seven other recaptures were made aboard skipjack sampans by the usual pole-and-line fishing method. The tag from Hilo indicated the skipjack had apparently not moved very far either before or after being engulfed by the big yellowfin tuna for the latter in turn was captured very close to where the tagging had originally been done. The tagged skipjack recaptured off Waianae, too, although they had been at liberty from 3 to 5 weeks, had made no spectacular migrations from the area off Barber's Point where they were released. One of them may have traveled up the coast to Kahuku and back in the 5 weeks since his tagging, for another skipjack from the same school had been retaken off Kahuku 6 days after being tagged off Barber's Point. To presume such a movement it would be necessary to assume that the skipjack schools are rather permanent aggregations, and this is a point about which little is known.

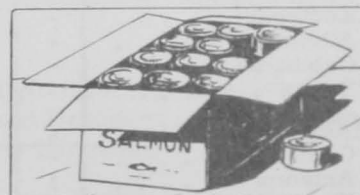
The objective of the skipjack tuna tagging program being carried on by the Pacific Oceanic Fishery Investigations in the Hawaiian area is to learn something about the rate of growth of these small tuna and about their seasonal migrations. Although the skipjack tuna is the most valuable commercial fishing resource in Hawaii and supports the only fish canning industry in the Territory, the fishery is confined almost entirely to the summer months and to a narrow zone immediately around the Islands. Information about the movements of the skipjack schools gained from a study of tag returns may eventually enable the Hawaiian sampan fleet to expand into new fishing grounds and to extend its fishing season over a greater part of the year.

Recaptures of tagged skipjack, although very few have been highly encouraging to the fishery biologists engaged in the program. They have demonstrated that the method as applied to skipjack will work, and that these active, nervous, easily injured fish can not only withstand the handling necessary for tagging but also recover quickly from the wound caused by tying a plastic tube through the skin and muscle of their backs. It has also been shown that the fishery is sufficiently intensive and the commercial fishermen are eager to cooperate.



## Canned Salmon Consumption in Federal Penal and Correctional Institutions, 1954

Salmon was served in 25 out of 27 Federal penal and correctional institutions during 1954, according to a survey made by the U. S. Fish and Wildlife Service from data furnished by the Federal Bureau of Prisons. These institutions had a combined population averaging 21,175 persons, and are located throughout the United States with the greatest concentration (13 out of 27) in the South.



Of all the institutions reporting, those located in the South used more pounds of canned salmon than did institutions in any other region of the United States. The average yearly consumption of 2.63 pounds per inmate was highest in the North Central part of the United States. The average yearly consumption for the 20 institutions reporting was 2.29 pounds per inmate.

Of 21 institutions reporting, 16 purchased canned salmon in 1 lb. cans, four in both 4 oz. and 1 lb. cans, and one in 12 oz. cans.

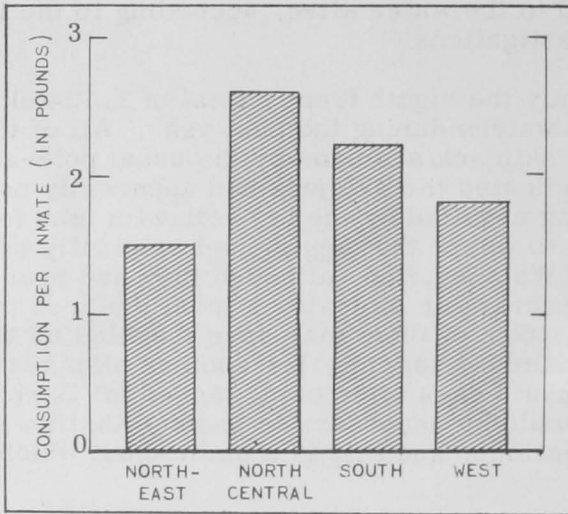


Fig. 1 - Canned salmon consumption per inmate in 20 Federal penal and correctional institutions, 1954.

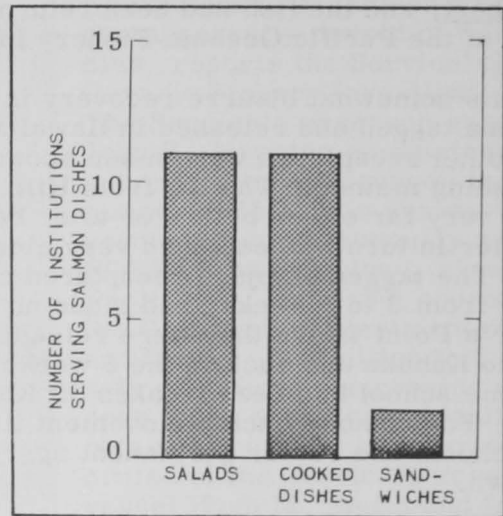


Fig. 2 - Types of salmon dishes served in Federal penal and correctional institutions, 1954.

Of 18 institutions reporting, 3 used canned salmon in salads only; 3 in cooked dishes only; 3 in sandwiches, cooked dishes, and salads; and 6 in salads and cooked dishes.

Table 1 - Canned Salmon Consumption in 27 Federal Penal and Correctional Institutions, 1954

Area	Non-users		Users					
	No. of Inst.	Avg. Pop. of Inst.	No. of Inst.	Avg. Pop. of Inst.	Annual Consumption	Per Capita Consumption	Can Size	Unit Cost Per Pound
					Pounds	Pounds		¢
<b>NORTHEAST:</b>	-	-	3	2,000	<u>1/</u>	<u>1/</u>	-	-
Connecticut . . . . .	-	-	1	500	Not Reported		Not Reported	
New York . . . . .	-	-	1	200	300	1.5	4 oz. & 1 lb.	52
Pennsylvania . . . . .	-	-	1	1,300	Not Reported		Not Reported	
<b>NORTH CENTRAL:</b>	1	2,675	4	4,325	11,366	2.63	-	-
Ohio . . . . .	-	-	1	1,250	3,432	2.75	1 lb.	43
Michigan . . . . .	-	-	1	1,325	3,168	2.39	1 lb.	45
Indiana . . . . .	-	-	1	650	2,666	4.10	1 lb.	44
Missouri . . . . .	-	-	1	1,100	2,100	1.91	1 lb.	48
Kansas . . . . .	1	2,675	-	-	-	-	-	-
<b>SOUTH:</b>	-	-	13	8,980	<u>1/</u>	<u>1/</u>	-	-
Washington, D. C. . . . .	-	-	1	460	2,748	5.97	1 lb.	46
West Virginia . . . . .	-	-	2	890	3,648	4.10	1 lb.	45
Virginia . . . . .	-	-	2	875	2,356	2.70	1 lb.	48
Georgia . . . . .	-	-	1	2,600	2,867	1.10	Not Reported	
Florida . . . . .	-	-	1	600	1,728	2.88	1 lb.	48
Kentucky . . . . .	-	-	1	525	2,100	4.00	1 lb.	40
Alabama . . . . .	-	-	1	240	Not Reported		Not Reported	
Oklahoma . . . . .	-	-	1	1,100	Not Reported		1 lb.	35
Texas . . . . .	-	-	3	1,690	1,956	1.16	4 oz. & 1 lb.	48
<b>WEST:</b>	1	275	5	2,920	<u>1/</u>	<u>1/</u>	-	-
Colorado . . . . .	-	-	1	400	Not Reported		1 lb.	42
Arizona . . . . .	1	275	1	300	1,500	5.00	1 lb.	34
Washington . . . . .	-	-	1	1,400	1,680	1.20	12 oz.	51
California . . . . .	-	-	2	820	1,440	1.76	1 lb.	46
<b>Total . . . . .</b>	<b>2</b>	<b>2,950</b>	<b>25</b>	<b>18,225</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

1/ Data not available.



## Saltonstall-Kennedy Act Fisheries Projects

PROGRAM APPROVED FOR SECOND YEAR: Allocation of the entire \$3 million available for the second year of the expanded fishery-research and market-development program launched last year by the U. S. Fish and Wildlife Service under the terms of the Saltonstall-Kennedy Act was announced by Secretary of the Interior Douglas McKay on October 6.

The legislation, designed to promote increased production and marketing of domestic fishery products, provides that an amount equal to 30 percent of duties collected under the customs laws on fishery products shall be transferred annually for three years from the Department of Agriculture to the Department of the Interior. Expenditures for any one year may not exceed \$3 million.

In fiscal year 1956, \$2,729,700 will be expended for the continuance of projects initiated last year and which require more than one year to complete. These projects have all been endorsed by the American Fisheries Advisory Committee.

A balance of \$270,300 is available for the initiation of certain new projects which were recommended by the Advisory Committee during its second meeting held in Boston in late August.

In proposing activities to be initiated in fiscal year 1956, the Committee emphasized the importance of a substantial number of projects which amounted to somewhat more than \$1 million. After a careful review, the Service selected the following projects, which were strongly recommended by the Committee:

Tuna Bait Substitute Studies--\$35,000. The tuna clipper fleet is required to spend a substantial portion of its time in search of bait. The development of an artificial bait should cut the costs of operation of the fleet and make it possible to operate more economically.

Alaska Salmon Research--\$108,000. This amount will be divided among four separate research projects on Alaska salmon problems, as follows:

1. The effects of logging resulting from the newly-developed wood-pulp industry on the productivity of pink salmon streams, especially in Southeastern Alaska, \$35,000.
2. A study of the distribution, abundance, movements, food, and methods of control of sea lions and hair seals said to be predators on halibut, cod, and herring, as well as salmon, \$20,000.
3. A study of the migratory and schooling habits of the valuable red salmon runs in Bristol Bay through a system of tagging, \$35,000.
4. Tests of automatic equipment for enumerating salmon escapement as a possible means of replacing about 25 weirs which are costly to operate and require personal attention, \$18,000.

Atlantic Striped Bass Research--\$32,000. This will provide for the Service's part of a coastwide Federal-State study with headquarters at Beaufort, N. C. Striped bass provides an important fishery from Massachusetts to Florida.

South Atlantic Shrimp Exploration--\$60,000. This study will provide for exploratory fishing for new shrimp areas in greater depths on the South Atlantic coast. An expansion of present shrimp grounds from the inshore or shallow water areas would provide more profitable operating opportunities for the shrimp fleet.

**Improvement in Quality of Skipjack Tuna--\$10,000.** These small-size tuna are difficult to preserve aboard the fishing vessel and large losses from spoilage are sustained. The California Fish and Game Commission is studying the problem under a contract awarded by the Fish and Wildlife Service in the first year of the program. Several possible solutions to the problem appear promising. A second year's contract will insure completion of this study.

**Prestandards for Fresh Fish--\$25,000.** It is generally recognized that current practices of handling fresh fish and shellfish, beginning at the point of capture, need improving. Better practices will benefit users of fresh fish and also those who process them further into frozen, canned, or smoked fish.

As in the first year, a number of the above projects will be carried out under contract with college, State, and private research organizations.

Under the total \$3 million program, about \$1 million has been allocated to various biological studies and a like amount will be expended this fiscal year for technological research and educational and marketing activities.

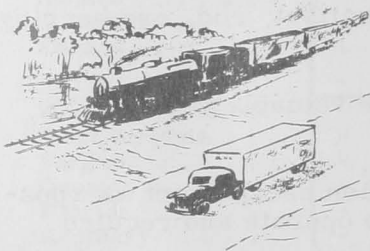
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**SERVICE OPENS FOUR NEW STATISTICAL OFFICES:** In September the Service's Branch of Commercial Fisheries opened fishery statistics offices at Brunswick, Ga., Houma, La., Galveston, Tex., and Fort Myers, Fla. The offices will collect detailed data on employment in the fisheries, number of craft and quantity of gear, the catch of fishery products, and related information. Detailed data on the shrimp fishery will be obtained in connection with the Service's expanded program for the collection of shrimp statistics. These projects are being financed by funds provided by the Saltonstall-Kennedy Act (68th Sta. 376).

Lloyd E. Johnson will be in charge of the Fort Myers office; Vibert L. Stock, a former employee at the Brunswick Marine Laboratory of the Service's Branch of Fishery Biology, will be in charge of the Brunswick Statistical Office; Anthony Inglis of the Galveston office; and O'Neil J. Engeron of the Houma office.

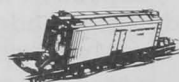


### Shrimp Rail-Freight Rates Reduced



The railroads have announced that a proposed rate of \$1.87 per 100 pounds, minimum weight 46,000 pounds, has been approved. This new rate is expected to be effective early in November and will apply to all shipments from Texas and Louisiana shipping points to states east of Pittsburgh, Pa., and north of Washington, D. C. The refrigeration charges will also be adjusted so that the total cost of shipping shrimp by rail will be lower than current costs by truck. The new rate will apply to all

types of fresh and frozen shrimp, including breaded or cooked shrimp.



### South Carolina

#### FISHERIES BIOLOGICAL RESEARCH PROGRESS, JUNE-SEPTEMBER 1955:

**Oyster Research:** Two pieces of information recently disclosed may prove a boon to a future South Carolina seed-oyster business. At a conference held in Baltimore in August, at the National Shellfisheries Association meeting, it was brought out that seed oysters transplanted from the Wadmalaw Island, S. C., Laboratory to

the Virginia Fisheries Laboratory are resistant to Dermocystidium, a disease which seriously affects oyster production in Virginia. Discussion also indicated that South Carolina seed could be produced in polluted water since they would be moved to pure water long before they were large enough to be marketable. Thus, the ever-increasing acreage of oyster bottoms in this State removed from production because of pollution can be put back into good economic use, according to Progress Report No. 25 from the Bears Bluff Laboratories.

A committee of six marine biologists from Maryland, Louisiana, and North Carolina reviewed the findings of the Virginia Fisheries Laboratory on the disastrous oyster mortalities in the Chesapeake Bay area, particularly the Rappahannock River. The committee found that the mortalities of oysters there were directly attributable to the excessive rainfall from hurricanes "Connie" and "Diane." These two hurricanes also wreaked havoc with the oyster industry in North Carolina.

Strangely enough, even though these hurricanes passed well off shore of the area where Bears Bluff is located, they also influenced the oysters being grown experimentally at the Laboratories. Between August 10 and September 17, 1955, the Laboratories' rain gauge indicated that more than 16 inches of rain fell in the immediate area. Of approximately 300 individual oysters which have been counted and measured monthly for the last two years, a sudden increase of 8 percent in the mortality rate occurred coincident with, and presumably due to, this heavy rainfall. The Laboratories is now operating without personnel working directly on oysters so that direct study on the actual oyster beds could not be made, but casual observation indicated a similar occurrence on the commercial oyster beds near the Laboratories.

Shrimp Research: Progress in the Laboratories offshore exploration research project made during the closing weeks of this quarter increased confidence in the program. On September 28 and 29, some 60 miles off the lower coast of South Carolina the research vessel ran into what must have been large schools of spot. At 9:30 p. m. on September 29 in  $34\frac{1}{2}$  fathoms of water, 44 pounds of spot nine inches long and 3 to the pound were taken in a 30-minute try-net drag. These fish continued to be numerous all through the experimental drags made at night in that area.

Likewise of great interest was the abundance of rock shrimp (Sicyonia brevirostris) found at night in all experimental drags in the 35-37 fathom area to the south-southeast of the North Edisto entrance. Rock shrimp are seldom sold on the market although some are caught off the Campeche Banks and off the Florida Keys shrimp-grounds. These shrimp when caught are usually reserved as a highly-prized dish by the trawl-boat crews. Are these shrimp year-round inhabitants of the offshore Carolina waters, and are they of sufficient abundance to warrant a commercial fishery? The answer lies in the future. Of scientific interest was the capture of large numbers of female brown shrimp, Penaeus aztecus, with spermatophores attached (an indication of spawning). These shrimp were taken off and on during mid-September in 5 fathoms, just along the edge of and outside the usual shrimp-grounds for white shrimp. In studying the shrimp there are many environmental factors to consider, but with these brown shrimp one thing stands out consistently-- they were taken when and where the water temperature ranged from  $71^{\circ}$  to  $75^{\circ}$  F. In the areas where and when the water temperatures ran between  $80^{\circ}$  and  $83^{\circ}$  F. practically no brown shrimp were taken.

Salt-Water Ponds: The study of shrimp, crab, and fish in the salt-water experimental ponds at Bears Bluff continued to be an important source for information on the general life history of these marine organisms. On August 15, the salt-water experimental ponds were drained hurriedly and two months ahead of schedule for fear that hurricane "Connie" would overflow the ponds. Had this happened, the validity of the experiment would have been questionable. One of the experimental ponds, containing between 75,000 and 85,000 cubic feet of water, yielded a large harvest of seafood. Slightly over 400 pounds of fish, crabs, and shrimp, consisting of 9,483 individuals, was harvested from this pond. This seafood had accumulated in the pond in  $8\frac{1}{2}$  months.

## U.S. Foreign Trade

United States Foreign Trade in Edible Fishery Products, June 1955 With Comparisons						
	Quantity			Value		
	June 1955	1954	Year 1954	June 1955	1954	Year 1954
	(Millions of Lbs.)			(Million of \$)		
<b>Imports:</b>						
Fish & shellfish: fresh, frozen, & processed <u>1/</u>	61.5	70.6	801.7	18.2	20.1	202.8
<b>Exports:</b>						
Fish & shellfish: processed <u>1/</u> only (excluding fresh and frozen)	3.6	2.1	50.8	0.9	0.7	13.2
<u>1/</u> Includes pastes, sauces, clam chowder and juice, and other specialties.						

**EDIBLE FISHERY PRODUCTS, JUNE 1955:** Fresh, frozen, and processed edible fish and shellfish United States imports in June 1955 amounted to 61.5 million pounds (valued at \$18.2 million), reports the Bureau of Census in a summary report (see table). This was a drop of 12.9 percent in quantity and 9.5 percent in value as compared with the same month a year earlier.

Exports of processed edible fish and shellfish (excluding fresh and frozen) in June 1955 amounted to 3.6 million pounds (valued at \$0.9 million), a substantial increase of 71.4 percent in quantity and 28.6 percent in value.

\* \* \* \* \*

**GROUND FISH FILLET IMPORTS DECLINED AGAIN IN SEPTEMBER 1955:** Imports of groundfish fillets, including ocean perch fillets, during September 1955 amounted to 10.4 million pounds. Compared with the 12.2 million pounds of groundfish fillets reported for the corresponding month of last year, this was a decrease of 15 percent. The decrease was caused principally by greatly reduced imports from Iceland (a 73-percent decline). Compared with the same month of last year, other countries also exported less groundfish fillets to the United States during September 1955. They were Norway (down 87 percent), Denmark (45 percent less), and West Germany (a decrease of 21 percent). Canada continued to lead as the chief exporting country to the United States with 9.0 million pounds during September 1955, a gain of 12 percent over the 8.1 million pounds reported for the same month of last year. Canada accounted for 87 percent of the total fillet imports for the month. Iceland was in second place with 8 percent, followed by Denmark with 1 percent, and West Germany with 1 percent. The remaining 2 percent came from Norway, the United Kingdom, and Miquelon and St. Pierre.

Total fillet imports into the United States during the first nine months of the current years amounted to 96.8 million pounds, compared with 105.1 million pounds during the same period of last year--a decrease of 8 percent. Canada, with 73.7 million pounds, led all other exporting countries during the nine-month period, followed by Iceland (13.3 million pounds), Denmark (3.8 million pounds), and Norway (3.1 million pounds). These four countries accounted for 97 percent of the total for the period. (See chart 7 in this issue).

\* \* \* \* \*

**CERTIFICATIONS AVAILABLE FOR DIRECT IMPORTS OF FROZEN MARINE PRODUCTS FROM HONG KONG:** Certificates of origin issued by the Department of Commerce and Industry of the Government of Hong Kong under procedures agreed upon between that government and the Foreign Assets Control of the U. S. Department of the Treasury are now available for importation into the United States directly, or on a through bill of lading, from Hong Kong of fresh-frozen marine products. This notice appeared in the August 16 issue of the Federal Register.



## Wholesale Prices, August 1955

Adverse weather conditions on the East Coast plus seasonal declines in the production of other importing fish varieties resulted in a sharp increase in wholesale prices from July to August. The over-all index of edible fish and shellfish (fresh, frozen, and canned) in August 1955 was 111.7 percent of the 1947-49 average (see table)-- 7.9 percent higher than in July, but only 0.5 percent above August 1954.

Higher ex-vessel prices for large drawn haddock at Boston and wholesale prices for West Coast halibut and salmon at New York caused a sharp rise (36.7 percent) in the drawn, dressed, or whole finfish subgroup index from July to August. This increase was due primarily to higher prices paid for large haddock at Boston as a result of a hurricane. The August 1955 prices for whitefish and lake trout also rose substantially. Compared with August 1954, prices were higher (1.7 percent) this August for all the varieties used in this subgroup individually and as a subgroup.

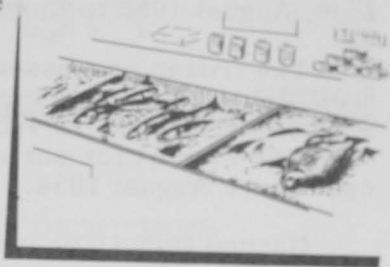


Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1955 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <sup>1</sup> / (\$)		Indexes (1947-49=100)				
			Aug. 1955	July 1955	Aug. 1955	July 1955	June 1955	Aug. 1954	
			<b>ALL FISH &amp; SHELLFISH (Fresh, Frozen, &amp; Canned)</b> . . . . .						
<b>Fresh &amp; Frozen Fishery Products:</b> . . . . .					119.7	106.3	107.4	120.1	
<b>Drawn, Dressed, or Whole Finfish:</b> . . . . .					136.6	99.9	101.3	134.3	
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.17	.06	167.4	57.4	87.5	161.0	
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.34	.29	106.0	90.8	74.3	99.0	
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.60	.58	135.4	130.3	129.2	130.4	
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.59	.33	146.3	81.8	120.2	131.4	
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.85	.65	171.8	131.4	136.5	131.4	
Lake trout, domestic, No. 1, drawn, fresh . . .	Chicago	lb.	.55	.46	111.7	93.2	107.6	107.6	
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.51	.69	119.6	161.8	103.8	114.9	
<b>Processed, Fresh (Fish &amp; Shellfish):</b> . . . . .					107.3	108.0	111.6	107.1	
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.34	.23	115.7	78.3	107.2	114.0	
Shrimp, lge. (26-30 count), headless, fresh . . .	New York	lb.	.62	.67	98.0	105.9	111.4	85.9	
Oysters, shucked, standards . . . . .	Norfolk	gal.	4.75	4.75	117.5	117.5	114.4	129.9	
<b>Processed, Frozen (Fish &amp; Shellfish):</b> . . . . .					99.3	106.7	103.2	93.9	
Fillets; Flounder (yellowtail), skinless, 1-lb. pkg. . . . .	Boston	lb.	.39	.39	102.1	102.1	102.1	100.8	
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.27	.27	84.7	83.2	81.6	95.7	
Ocean perch, skins on, 1-lb. pkg. . . . .	Boston	lb.	.27	.27	108.8	106.7	106.7	111.8	
Shrimp, lge. (26-30 count), 5-lb. pkg. . . . .	Chicago	lb.	.61	.71	94.1	108.8	103.4	80.2	
<b>Canned Fishery Products:</b> . . . . .					100.3	99.2	98.3	97.7	
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	case	20.70	20.70	109.6	109.6	109.6	104.4	
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans cs. . . . .	Los Angeles	case	12.80	12.80	92.3	92.3	90.1	95.5	
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. . . . .	Los Angeles	case	7.55	7.55	88.1	88.1	88.1	2/	
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs. . . . .	New York	case	7.45	6.70	79.3	71.3	71.3	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.  
<sup>2</sup>/Not available.



Prices of the fresh processed fish and shellfish were marked by only slight changes as a group. Fresh scrod haddock fillets rose 47.8 percent from July to August, reflecting the increase in ex-vessel prices of drawn haddock at Boston, but this increase was compensated by a drop in fresh shrimp prices. Price changes from August 1955 to August 1954 were negligible.

The frozen processed fish and shellfish subgroup index declined 6.9 percent from July to August due primarily to a drop of 13.5 percent in frozen shrimp prices. Frozen shrimp prices were still well above (17.3 percent) those for August 1954 when the market for shrimp was depressed. This subgroup index was up 5.8 percent above August 1954.

Canned fishery products prices changed very little between July and August with only a 1.1 percent increase due entirely to an increase of 75 cents per case for Maine sardines. Compared with August 1954, pink salmon prices went up 5 percent and Maine sardines prices rose 11.2 percent, but canned tuna prices dropped 3.4 percent because of liberal stocks.



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