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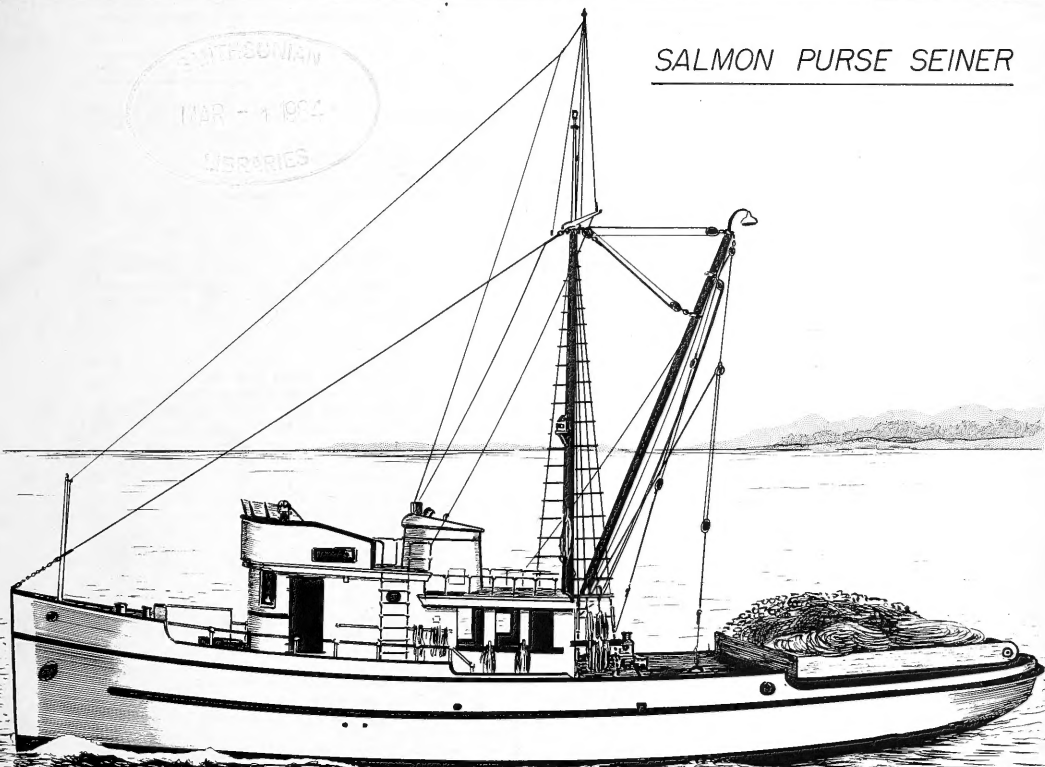
COMMERCIAL FISHERIES

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OCTOBER 1954

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



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor
J. Pileggi and J. J. O'Brien, Assistant Editors

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, November 5, 1952.

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EXPLORATORY SHRIMP FISHING IN THE GULF OF MEXICO, SUMMARY REPORT FOR 1952-54

By Stewart Springer and Harvey R. Bullis*

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SUMMARY

New shrimp resources have been found in the Gulf of Mexico by explorations for commercially-valuable grounds made by the Branch of Commercial Fisheries of the

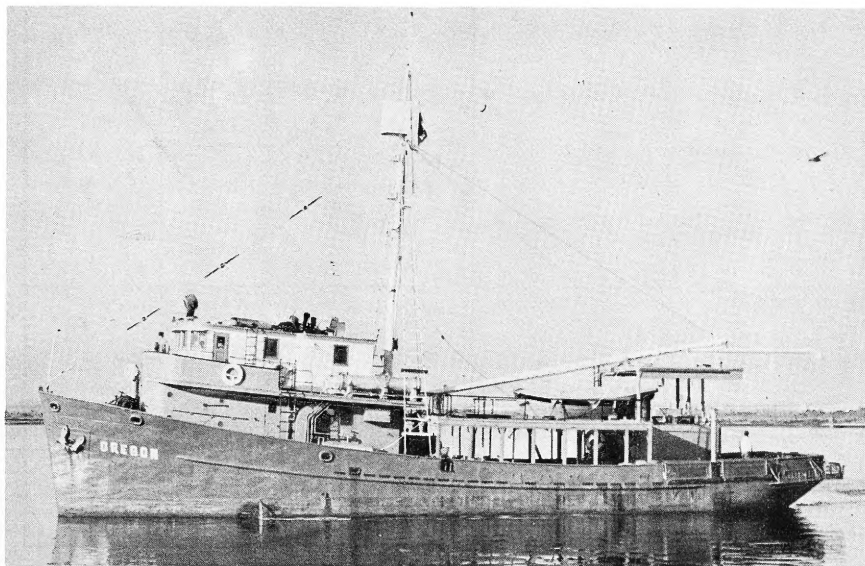


Fig. 1 - The exploratory fishing vessel Oregon operated by the U. S. Fish and Wildlife Service in the Gulf of Mexico since 1950.

* Fishery Methods and Equipment Specialists, Branch of Commercial Fisheries, U. S. Fish & Wildlife Service, Pascagoula, Mississippi.

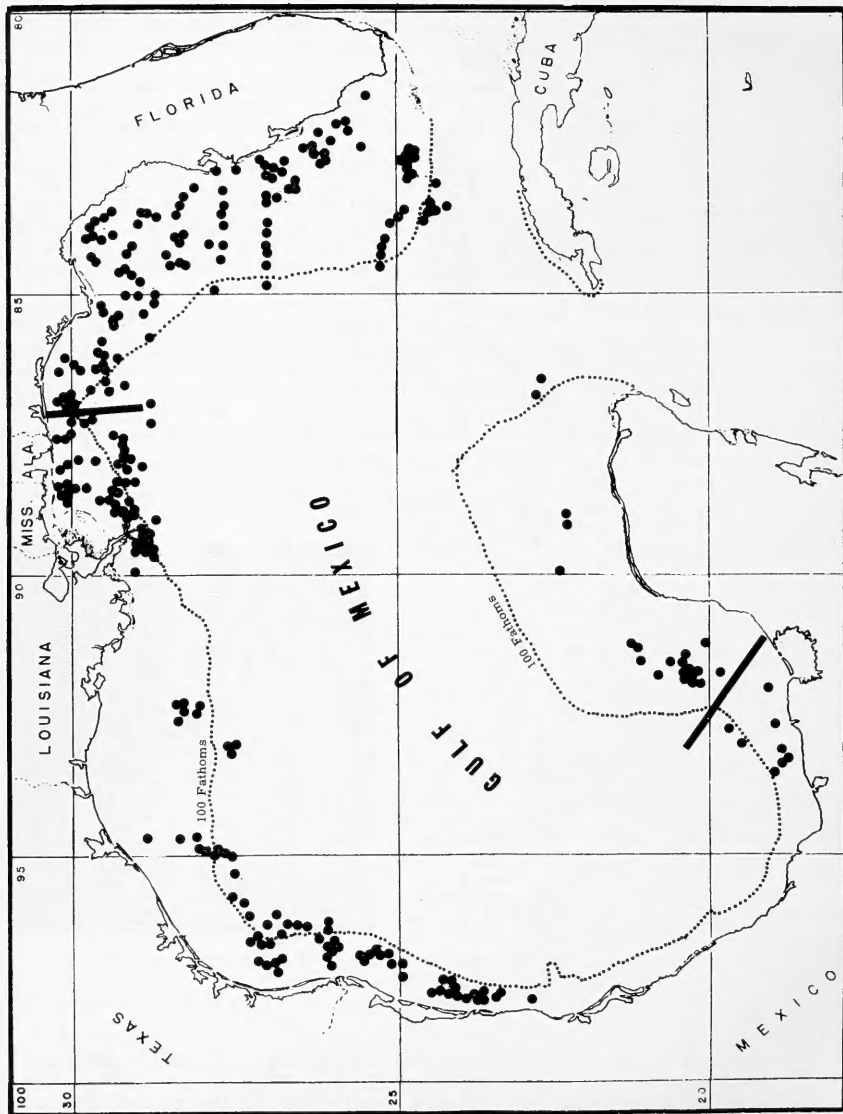


Fig. 2 - Distribution of exploratory shrimp trawl drags in the Gulf of Mexico by the Oregon, 1952 to June 1954. Dots show position of one or more drags. Black lines extending offshore at Pensacola and in the Gulf of Campeche show approximate dividing lines between east and west Gulf continental shelf bottom lines.

U. S. Fish and Wildlife Service. An extensive new fishing area for brown-grooved shrimp revealed by these explorations was immediately utilized by the shrimp fishing fleet. An extensive fishing area for deep-water red shrimp has also been discovered, but this species of shrimp has not been fished commercially as yet.

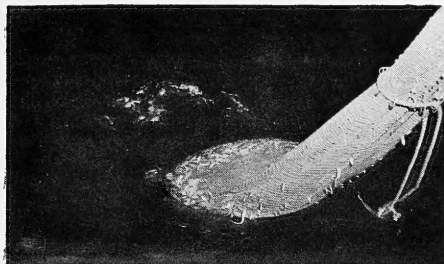


Fig. 3 - Shrimp trawl reaching the surface after nighttime drag.

Explorations for brown-grooved shrimp by the exploratory fishing vessel Oregon through 1953 have been sufficiently comprehensive to define all of the major areas of possible production along the Gulf Coast of the United States and to point out that the only presently unworked area of importance is the 35- to 50-fathom depth range on the coasts of Louisiana and Texas between the 91st and 95th meridians.

Explorations for pink-grooved shrimp have produced good catches on, or quite near, the major pink-shrimp fishing grounds off Dry Tortugas, Florida, and Campeche, Mexico, but in no other areas. The eastern Campeche Bank and most of the grounds off Florida west coast, believed to offer possibilities for production of pink-grooved shrimp, have had trawling-bottom areas and extensive trawling operations require development of new gear or methods.

Red shrimp, a type of shrimp not yet fished commercially, was found in 150 to 375 fathoms between Dry Tortugas and Aransas Pass. Catches show production possibilities if improvements in the methods of handling shrimp trawls in deep water can be worked out.

No evidence of stocks of white shrimp other than those now known to the shrimp fishery were found by the Oregon.

BACKGROUND

Shrimp production in the Gulf of Mexico reached nearly 152 million pounds (heads on) in 1950. From 1950 through 1953 landings were steady or slightly higher, but there were some substantial declines and sharp increases in certain parts of the Gulf. In 1950 the Dry Tortugas fishery was being intensively worked for the first time, and the newly-developed shrimp fishing grounds of the Gulf of Campeche were beginning to contribute heavily to the landings at Gulf fishing ports. Also, the brown-grooved shrimp was becoming an increasingly important component of the total catch. These conditions emphasized the importance of new fishing grounds for expansion of the fishery.



Fig. 4 - The bag full of fish is hoisted aboard.

The ranges of the three important commercial species of shrimp overlap to some extent, but each has its own habitat preference. This, in turn, presents a distinct exploratory problem for each species. Rarely are the two species of grooved shrimp taken in large numbers at the same time and place. The deep-water red

shrimp does not, as far as is known, ever appear within the range of those species landed in the Gulf at present.

The interdependence of exploratory fishing information, marketing conditions, and the availability of fishermen, vessels, and gear, is clearly illustrated in the expansion of the shrimp fishery. Exploratory information roughly outlining the fishing grounds for pink shrimp in the Gulf of Campeche was obtained by Japanese exploratory fishing vessels in 1936 and 1937 working under the auspices of the Mexican Government. However, at that time the market for pink shrimp did not exist and there were no fishing fleets capable of fishing these grounds. On the other hand, the conveniently accessible Dry Tortugas grounds, discovered by fishermen at a time when a strong market prevailed for shrimp, were heavily exploited at once.

The exploratory fishing vessel Oregon began explorations in the Gulf of Mexico in April 1950 on a recommendation by the Gulf States Marine Fisheries Commission. The Commission had requested that emphasis be placed on shrimp, with tuna and red snapper explorations as secondary objectives. Preliminary discussions of the exploratory methods to be followed brought out that priority should be given to the location of accessible unused fishing areas offering good catches to shrimp fishing vessels with standard equipment. This approach was carried out during 1950 and 1951 and a resume of the results (Springer and Bullis 1952) included a description of exploratory shrimp fishing methods and types of gear used. Construction details on the three basic trawl designs employed are described by Bullis (1951).

During 1952 and 1953 increased emphasis was placed on tuna explorations in the Gulf. Shrimp trawling was continued through this period to complete preliminary coverage whenever it was practical (fig. 2).

This report covers the Gulf-wide shrimp explorations made by the Oregon through June 1954. Exploratory shrimp trawling in deep water is continuing at the present time.

BROWN-GROOVED SHRIMP IN THE WESTERN GULF

The continental shelf area of the Gulf of Mexico is divided into two major bottom-type zones, each fairly uniform in composition throughout its range. Zone boundaries are somewhat arbitrary since there is a narrow transition area at each end.



Fig. 5 - Mixed shrimp and scrap fish are dumped on deck.

The western Gulf continental shelf zone extends from Pensacola westward and down the Mexican coast to a point between Carmen and Campeche, Mexico. Beyond the 10-fathom curve the bottom is primarily terrigenous mud or silt, but with mixtures of sand extending out to 30 or more fathoms in some areas. Mud lumps and large coral-rock structures are common beyond the 50-fathom curve out to the edge of the shelf.

The brown-grooved shrimp (*Penaeus aztecus*) is the principal species found in catches from the extensive mud bottoms of the continental shelf of Alabama, Mississippi, Louisiana, and Texas. White shrimp (*P. setiferus*) are also present in the same region, but fishable concentrations are generally restricted to the shallower water inside the 20-fathom curve. The brown-grooved shrimp (white shrimp are

not grooved) have a wider depth range. Although there are many instances, particularly at dawn and at dusk or in muddy water, when both species may be taken in a single drag, brown-grooved shrimp are usually caught in night drags while white shrimp are taken in the daytime. A few pink-grooved shrimp are found in the western Gulf of Mexico, and the range of the brown-grooved shrimp may extend into the eastern Gulf, but the commercial importance of these out-of-range shrimp is not known, perhaps because of the limited observations of fluctuating availability.

Brown-grooved shrimp have been taken in 85 percent of all exploratory drags made by the Oregon in depths of 10 to 70 fathoms between Cape San Blas, Florida, westward and southward on the continental shelf to Carmen, Mexico. During 1950-51 the Oregon trawled all major unfished potential brown-grooved shrimp areas in the Gulf. In 1952-53 repeat coverage was carried out in the same areas at different seasons. Coverage of many areas during the December-February period is incomplete due to severely curtailed fishing operations caused by unfavorable weather, although most of the good trawling bottom has been worked in several seasons.

The area that has repeatedly yielded the highest catch rate of brown-grooved shrimp lies in the 30- to 45-fathom depth range between 88° and 90° west longitude on both sides of the Mississippi Delta.

These grounds were reported by Springer (1951) after initial explorations in the fall of 1950 produced heavy catches at rates up to 315 pounds per hour. These high catch rates were obtained on grounds not previously fished. Radiotelephone reports to the nearby shrimp fleet on September 15 announcing that the Oregon had taken 2,700 pounds of 12- to 16-count shrimp (heads on) the preceding night resulted in immediate exploitation of the grounds. By the end of 1951 the commercial fleets were regularly fishing portions of the grounds in 30 to 45 fathoms on both sides of the Mississippi Delta. However, some sections were only partly fished through 1951 because the soft mud bottom bogged trawling gear. In 1952, after the introduction of the "mud rope," the entire area was being fished.

Eastward from 88° west longitude (east of Mobile) catch rates diminish rapidly. No catches of brown-grooved shrimp were made east of Cape San Blas, Florida. One area, in 45 to 65 fathoms off Pensacola, produced very large shrimp (3 to 6 per pound heads on) but exploratory drags did not indicate commercial concentrations. In the winter of 1952/53 a small fleet worked in this area but moved back to more productive grounds in the spring.

Westward from the Delta, all grounds that seasonally have commercially valuable stocks are being worked by the Texas and Louisiana fleets. Beyond the present depth range of this fishery, in 35 to 50 fathoms, there are extensive areas of good trawling bottom. Catches of 20 to 50 pounds per hour were made by the Oregon throughout this range, an average that is below the present minimum catch rate for offshore shrimp vessels. The highest exploratory catch in this range off the Texas coast was 150 pounds per hour. This area, due south of Galveston in 35 fathoms, is now included seasonally in the fishery.



Fig. 6 - Sorting the catch.

Off the Alabama, Mississippi, Louisiana, and Texas coasts, the steep slope of the continental shelf between 70 and 100 fathoms makes trawling difficult and impractical. The few drags successfully completed by the Oregon in this depth range brought up no brown-grooved shrimp.

Beyond 50 fathoms out to the edge of the continental shelf, poor trawling bottom was characteristic (see fig. 10). Of 29 exploratory drags made in the 50- to 60-fathom depth range along the Texas-to-Alabama coasts, 11 resulted in complete loss of trawling gear. Fifteen of the remaining 18 drags caught brown-grooved shrimp at rates of 1 to 60 pounds per hour. Of 50 drags made inside of 10 fathoms for comparative purposes, only 14 caught brown-grooved shrimp.

Most exploratory dragging was carried out with 40-foot flat shrimp trawls (construction details are given in Fishery Leaflet 394, Bullis 1951). When good fishing grounds were indicated by the 40-foot trawl catches, larger commercial-type gear was used. These included 55-, 65-, and 100-foot flat trawls, and 74- and 125-foot balloon trawls. Most production-type trawling was carried out with either the 74-foot balloon trawl or the 100-foot flat trawl, depending upon bottom conditions.

Despite efforts to select good trawling bottom for exploratory work, gear loss was severe. Twenty trawls were lost, including one or both trawl doors on nine occasions. Twenty-nine other trawls were so severely damaged that they required almost complete refabrication. The reason for many of these losses could not be determined; however, the following breakdown based on estimated causes indicates the types of hazards encountered.

Total loss of trawling gear (reason unknown)	5
Hit obstruction (i.e., wreck, lump, etc.)	6
Bogging in soft mud	6
Torn up on coral bottom	5
Overload of bottom trash (i.e., sponge, urchins, etc.) ...	3
Netting badly ripped or lost, lines cut (reason unknown) ...	24
Total ..	49

Gear damage occurred in spite of the fact that exploratory trawls are generally made of heavier twine than normally used and that depth-recorder tracings have been closely watched during the course of trawling.

At irregular intervals the fleets working on brown-grooved shrimp lose contact with the concentrations, forcing a temporary suspension of fishing operations. On three occasions along the Texas and Louisiana coasts, the Oregon has covered areas under these conditions with a series of trawling transects from shallow water out to the edge of the continental shelf, attempting to determine if this resulted from a mass movement or a dispersal of the shrimp concentrations. Each time a similar pattern of bottom temperatures was noted. This was characterized by little variation over wide depth ranges, usually less than 2° F., between 10 fathoms and the edge of the shelf. The nature of the catches on the shelf indicated a general dispersal of the stock rather than any mass movement. Thinly scattered brown shrimp of mixed sizes were found to be more or less evenly distributed over a wide depth range, making commercial trawling unprofitable.

PINK-GROOVED SHRIMP IN THE EASTERN GULF

The eastern Gulf continental shelf zone extends from Pensacola south along the Florida coast and includes the Campeche Bank down to Carmen, Mexico. These two sections are characterized by sand, shell, and coral gravel; and by live coral overlying white, gritty, calcareous mud.

Extensive areas along the west coast of Florida and on the Campeche Bank within the depth range of pink-grooved shrimp (*Penaeus duorarum*) received scanty exploratory trawling prior to 1954. The possible development of confined limited production areas was indicated by the occasional good catches by vessels in small isolated gulleys of clear mud bottom; the presence of young pink-grooved shrimp in



Fig. 7 - After sorting, weights and counts are recorded for each species in the catch.

ing area off Campeche and demonstrated that equally high catches could be maintained out to 25 fathoms at distances of 20 to 25 miles away from the area of intensive fishing.

In June 1950, January and February 1951, July and December 1952, and in June 1953, exploratory soundings were made in 10 to 25 fathoms between Apalachee Bay and the Dry Tortugas grounds in search of level bottom sufficiently clear of coral and loggerhead sponge to permit trawling with conventional type trawling gear. The few drags made in less hazardous-appearing areas off Cedar Keys, Tampa, and Boca Grande generally resulted in severe gear damage.

Owing to the time-consuming nature of developing trawling gear suited to this type of bottom, experiments were limited in favor of explorations in areas suitable to existing gear. However, some progress has been made in combating certain trawling hazards. Several types of bottomless trawls were used successfully in loggerhead-sponge areas. They were designed to break the sponge away from the bottom and permit it to pass between stringers running from the tickler chain back to the unweighted lead line. Subsequent comparison drags with standard commercial trawls showed an average reduction of 75 percent of trash and scrap fish and a reduction of the shrimp catch by about 30 percent.

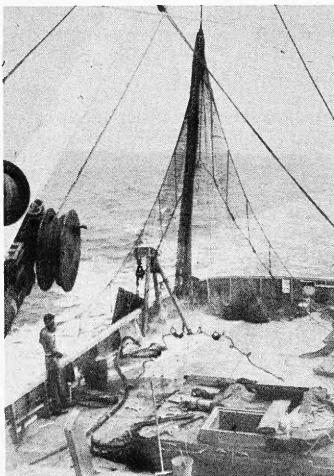


Fig. 8 - The 40-foot bottomless trawl developed for exploratory dragging on loggerhead-sponge bottom.

In 1953 an "Echograph" depth sounder was installed on the *Oregon*. The fine delineation of bottom conditions obtained with this recorder (fig. 10)

was put to use for two cruises in 1954 to make a comprehensive trawling survey of the bad bottom areas along the west coast of Florida between Cape San Blas and Dry Tortugas with the primary objective of locating trawlable bottom in the pink-shrimp depth range.

Two types of heavy-duty trawls were rigged for working this area. The first was a 40-foot flat trawl of $2\frac{1}{2}$ -inch mesh body, 42-thread cotton twine. The other style used was a 40-foot 1-seam New England-style flat trawl of 42-thread cotton, $2\frac{1}{2}$ -inch mesh body. Both nets were hung on $\frac{3}{8}$ -inch wire rope wrapped with manila, and had $1\frac{1}{4}$ -inch mesh, 42-thread cotton cod ends protected with bullhide chafing gear.



Fig. 9 - Overloading with loggerhead sponges is a major hazard to trawling in wide areas off southwest Florida. Catches of sponge are so heavy in some areas that nets cannot be hauled aboard.

inside the 15-fathom curve. Drags in deeper water failed to catch a single pink-grooved shrimp. Several recorder transects were made over the "Middle Grounds;" however, no bottom suitable for even a test drag was located. Drags on the periphery of the "Middle Grounds" failed to bring up a single specimen of commercially valuable shrimp.

In general, catches were exceedingly small throughout this area and the amount of scrap fish was the lowest for any Gulf area covered by the Oregon to date.

On cruise 22 (March 31-April 23, 1954), 62 drags were made from Tampa Bay to the southern end of the Florida shelf between 3- and 375-fathom depths (fig. 11). Most of these hauls were made inside the 25-fathom curve between Tampa Bay and Cape Sable. Bottom conditions for most of this area were similar to those found on the preceding cruise. Moderate-to-heavy concentrations of loggerhead sponges were found to be generally distributed inside of the 35-fathom curve and four trawls were severely damaged due to overloading. One catch of 6,000 pounds of loggerheads was made in a half-hour drag. Drags between 5 and 15 fathoms generally showed pink-grooved shrimp present, but catches all ran under 15 pounds per hour.

RED SHRIMP IN DEEP WATER OF THE GULF (1,000 FEET OR MORE)

Beyond the edges of the continental shelf there has been no commercial fishing in the Gulf of Mexico. Snapper fishermen have extended the range of their fishing from about 80 fathoms to about 150 fathoms within the past few years. This has been possible because of new developments in fishing gear, such as power reels, stainless steel wire lines, and electronic aids for finding position, depth, and good fishing places. Deep-water fishing for snappers has not been better than fishing in

During cruise 21 (March 2-23, 1954), 51 drags were made between Cape San Blas and Tampa Bay (fig. 11). All of these drags were made in restricted areas of fair-to-good trawling bottom that were closely limited by untrawlable zones of live coral and coral rock. It seems certain that lighter gear would have sustained severe damage even in these selected areas since large pieces of living coral were brought up in many of the hauls.

No promising indications of shrimp concentrations were located on this cruise. Pink-grooved shrimp were taken in very small numbers

shallower water, but it has made it possible for snapper fishermen to move offshore during periods of temporary poor fishing on the shallow banks. The net results has not been larger daily catches but better trips and greater seasonal earnings for well-equipped and well-managed vessels.

The discovery of red shrimp (*Hymenopeneus robustus*) concentrations, through explorations by the Oregon, appears now to be significant as a possible supplement to inshore fishing.

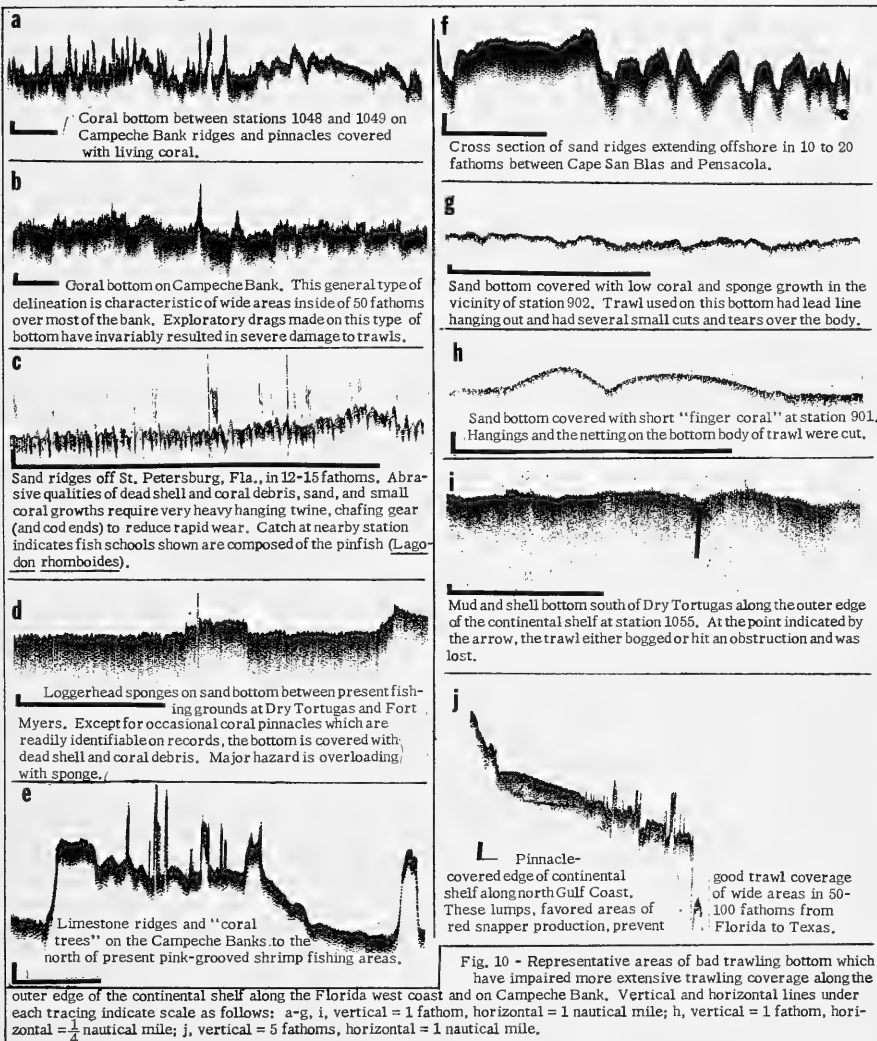


Fig. 10 - Representative areas of bad trawling bottom which have impaired more extensive trawling coverage along the outer edge of the continental shelf along the Florida west coast and on Campeche Bank. Vertical and horizontal lines under each tracing indicate scale as follows: a-g, i, vertical = 1 fathom, horizontal = 1 nautical mile; h, vertical = 1 fathom, horizontal = 1/4 nautical mile; j, vertical = 5 fathoms, horizontal = 1 nautical mile.

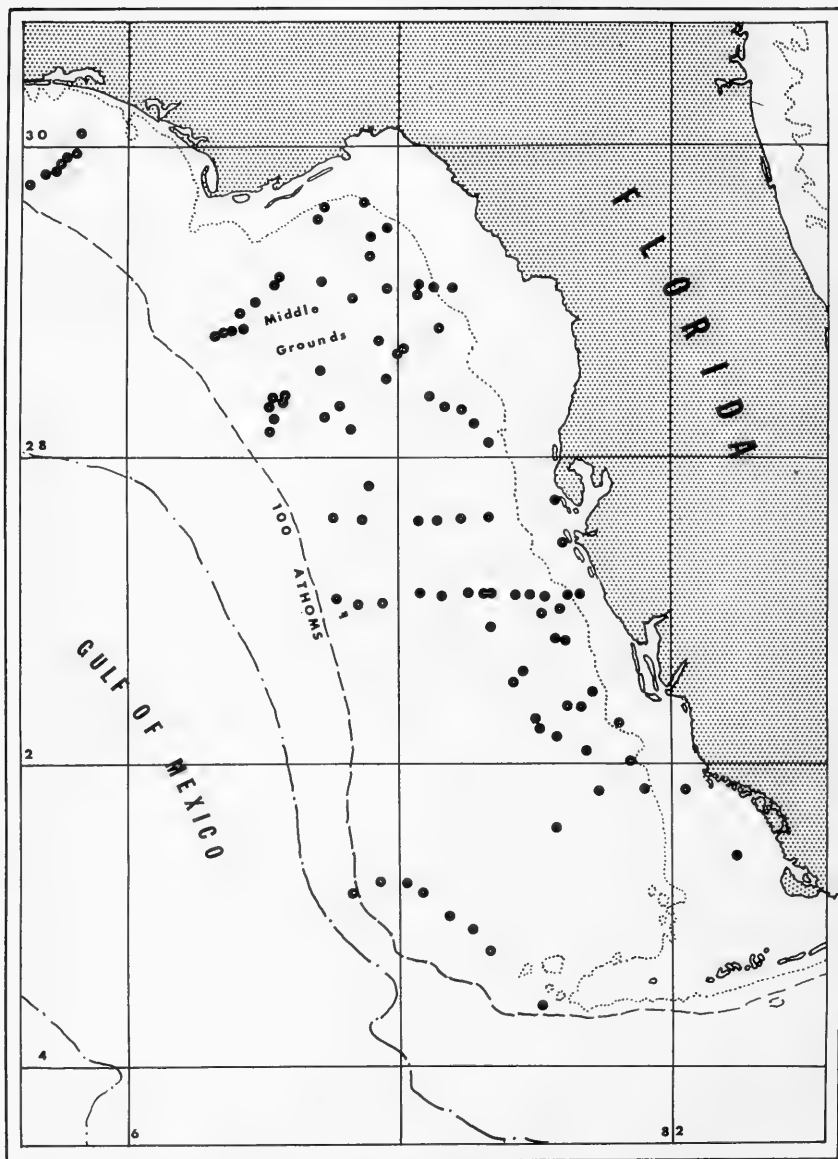


Fig. 11 - Distribution of exploratory shrimp trawl drags in bad-bottom areas along the west coast of Florida during cruises 21 and 22 (March and April 1954). Each dot represents one or more trawling stations.

In 1951 drags by the Oregon in depths between 190 and 240 fathoms brought to light a stock of red shrimp which differed from other common large shrimp in that it was confined to relatively deep water. These shrimp, although apparently marketable, have not yet been fished by the shrimp fleet.

Subsequent exploratory drags by the Oregon produced red shrimp from depths of 150 fathoms to 375 fathoms, but the best catches were made eastward from the Mississippi River Delta to the Pensacola meridian in 185 to 275 fathoms and southwest of Dry Tortugas. One of the major trawling hazards in these depths is the bogging in soft mud bottom. However, after the development of the Weems trawl door (a door combining certain features of the standard Gulf trawl door and rocking



Fig. 12 - Catches of loggerhead sponge like this are common in 5 to 35 fathoms in the offing between Tampa and Cape Sable.

chair doors often employed in the mud lump area off the Mississippi Delta) and using mud ropes, this hazard was greatly reduced (fig. 13). The drags made by the Oregon in deep water have been essentially exploratory and have shown that the red shrimp are present at appropriate depths along the entire continental shelf.

In September 1952 the M/V Antillas, owned by the Gibbs Corporation of Jacksonville, Florida, in cooperation with the Fish and Wildlife Service, made a series of drags for red shrimp in the north Gulf. Some difficulty was encountered at first due to bogging, but after a mud rope was put on, drags produced an average 70 pounds per hour in the area of best fishing. The best fishing was found from the Mississippi Delta eastward along the 200-fathom curve for about 100 miles.

Red shrimp reach about the same size as the common commercial shrimp and in catches by the Oregon the larger ones were taken in 190 or more fathoms. A number of other kinds of shrimp were taken by the Oregon in deep water. Most of these appear to be too small to be of commercial interest. However, a wine-red shrimp (Plesiopenaeus edwardsianus) taken in from 300 to 400 fathoms, reaches the size of the commercial species. It is not believed to be a bottom-dwelling shrimp, and a few of these have been taken by the Oregon. Another species, similar in appearance to the red shrimp but smaller, was taken in considerable quantity mixed with the larger red shrimp in Oregon catches made between 150 and 200 fathoms. This shrimp (Penaeopsis megalops) tastes very good but the Oregon did not produce them larger than 40 count (heads on).

Red shrimp handled on the vessel were beheaded and washed thoroughly as soon as they were brought on deck. Heads are large, and beheading resulted in a weight loss of 50 percent. They were then packed in 5-pound cartons and frozen. Under these conditions they were found to make an attractive appearance and had fine flavor and texture. No red shrimp have been handled on ice, but a trial of icing methods on the Oregon is planned for the fall of 1954.

CHANGES IN CATCH COMPOSITION

It is common knowledge that changes occur in the fishing grounds from year to year and that these changes may bring either more valuable or less valuable catches. Not only does the volume change, but the kinds of shrimp and fish caught on some Gulf grounds appear to change from time to time. There are many examples in the records of Oregon catches indicating that change in catch composition is a normal condition.

We have previously reported (Springer and Bullis 1952) the presence of pink-grooved shrimp off the Alabama and Mississippi coasts making up as much as 30 percent of the grooved-shrimp catch of some vessels in the late spring and summer of 1950. Very few pinks, not more than one percent of the catch of grooved shrimp, were noted in the following three spring and summer seasons. Furthermore, there was substantial agreement among commercial fishermen that few pink-grooved shrimp had been present in catches prior to 1950. In January 1951 the Oregon made a series of 5 exploratory drags between Fort Myers and Tampa Bay in depths of 6 to 18 fathoms. Three of these drags (of 15 to 30 minutes duration) resulted in such heavy catches of loggerhead sponges that the nets were badly ripped while hoisting them aboard and most of the catch was lost. Although pink-grooved shrimp were taken, there was no indication of commercial concentration from any of these catches. However, in the summer of 1953 commercial fishing by a few vessels was carried on near Fort Myers in 7-8 fathoms with moderate success.

In August 1953 a few landings of shrimp in Louisiana for canning received special attention because, although the shrimp were quite fresh, they were reddish. A sample of the catches was examined and found to be made up of Trachypenaeus constrictus, about 30 count (heads on). This kind of shrimp is not ordinarily taken in sufficient quantity to be of any commercial importance and those taken would normally pass unnoticed or be culled out of shrimp catches as too small.

Many of the changes are relatively obscure and affect shrimp or fish of little commercial importance. Some of the changes occur over such a long period of time that they pass unnoticed. For example, there are two species of white trout (Cynoscion arenarius and C. nothus) found along the north Gulf coast so similar in appearance that fishermen do not recognize them as different kinds. But the two can be very easily distinguished once the differences are known. C. nothus was so rare in Oregon catches from 1950 through 1952 that only three fish were recorded, but in 1953 this white trout was present in substantial numbers in all drags made inshore in the north-central Gulf.

It is necessary to take the probability of some change in the fishing situation into consideration in the evaluation of exploratory data.

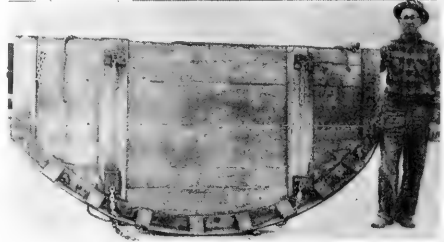


Fig. 13 - The Weems trawl door, designed to be used with large shrimp trawls on soft mud bottom.

Fishing Log--1952-54 Trawling Stations, M/V Oregon

Table with columns: STATION NUMBER, DATE, NORTH LATITUDE, WEST LONGITUDE, DEPTH FATHOMS, GEAR USED, DRAGGING TIME, BOTTOM TYPE, GEAR DAMAGE, BOTTOM TSP., TOTAL CATCH IN LBS., SHED/P CATCH IN LBS., CATCH IN LBS. (HEADS-ON COUNT), and SCRAP. Rows list various fishing stations and their corresponding data.

Note: Table continued on following page.

Fishing Log--1952-54 Trawling Stations, M/V Oregon (Continued)																
STATION NUMBER	DATE 1952	NORTH LATITUDE	WEST LONGITUDE	DEPTH IN FATHOMS	GEAR USED	DRAGGING TIME		BOTTOM TYPE	GEAR DAMAGES	BOTTOM TYP.	TOTAL CATCH IN LBS.	SPECIES CATCH IN LBS. (HEADS-IN QUANT)				SCRAP
						START	FINISH					BROWN	PINK	WHITE	RED	
656	10/12	23-35	97-28	35	40'F	2355	0025	stk.bu.M.	-	72.9	7	3 only	-	-	-	-
657	10/12	23-35	97-28	30	40'F	2355	0025	stk.bu.M.	-	79.1	2	1 (16)	-	-	-	-
658	10/13	23-49	97-32	20-27	100'F	0004	0345	stk.bk.M.	-	79.5	255	131 (17)	-	-	-	123
659	10/13	23-56	97-33	22-27	100'F	0020	0720	stk.bk.M.	-	78.4	520	170 (17)	-	1	-	350
660	10/13	24-21	97-27.5	30	40'F	0900	0930	M.	-	75.6	2	5 (16)	-	-	-	-
661	10/13	24-21	97-22	25	40'F	1030	1050	bu.bk.M.	-	73.2	4.5	2 (17)	-	-	-	2.5
662	10/13	24-12	97-17	40	40'F	1230	1300	bu.bk.M.	-	73.4	5	2 (17)	-	-	-	-
663	10/13	24-17	97-15	40	100'F	1830	2030	aft.bk.M.	-	72.7	186	5	20 (9)	-	-	150
664	10/13	24-16	97-26	20-25	100'F	2220	0050	M.	-	81	0	-	-	-	-	-
665	10/14	24-22	97-29	18-20	100'F	0100	0400	aft.bk.M.	-	80.2	496	121 (23)	-	-	-	300
666	10/14	24-28	97-27	18	100'F	0425	0715	bu.bk.M.	-	80.6	488	141 (23)	-	-	-	347
667	10/14	24-57	97-09	30-35	40'F	1025	1225	aft.gr.M.	-	79.3	3	1 only	-	-	-	-
668	10/14	24-57	96-58	40	40'F	1200	1230	gr.M.	-	65.8	5	5 (16)	-	-	-	4.5
669	10/14	25-02	96-53	35-52	40'F	1230	1930	M.	-	71.8	21	8 (11)	-	-	-	-
670	10/14	25-02	96-48.5	35-52	40'F	2025	2300	M.	-	65.5	65	5 (20)	-	-	-	-
671	10/15	25-23	96-43	43	80'B	0020	0220	M.	-	76.6	23	2 (11)	-	-	-	-
672	10/15	25-29	96-45	37	80'B	0240	0540	M.	-	80.6	470	140 (13)	-	-	-	230
673	10/15	25-35	96-47	31	80'B	0500	0625	M. (obstr.)	7	80.6	11	11 (13)	-	-	-	-
674	10/15	25-35	96-47	31-29	40'F	0705	0835	M.	-	81	9	8 (14)	-	-	-	-
675	11/6	30-08	88-32	7	40'F	1530	1630	gr.S.M.	-	68.6	17	-	-	-	-	17
676	11/6	30-04.5	88-32.6	10	40'F	1655	1735	gr.S.M.	-	70.9	63	-	-	-	-	63
677	11/6	30-00.3	88-28.8	15	40'F	1820	1850	bu.M.S.	-	71.1	7	5 only	-	-	-	224.5
678	11/7	28-57.6	89-12	14	40'F	1515	1545	gr.S.M.	-	73.1	0	-	-	-	-	114
679	11/7	28-57.6	89-12	14	40'F	1515	1545	aft.M.	2	70.9	0	-	-	-	-	20
680	11/7	28-58.5	89-15	14	40'F	1640	1710	M.	-	70.9	9	-	-	-	-	-
681	11/7	28-52.6	89-31	30	100'F	1845	1945	M.	-	68.4	608	59 (25)	-	-	-	549
682	11/8	29-00	89-27.6	17	100'F	0920	1020	M.	-	70.2	304	27 (17)	-	11 (17)	-	204
683	11/8	29-03	89-28	5	100'F	1000	1200	M.	-	70.2	204	-	-	34 (14)	-	167
684	11/8	28-27.7	89-22	50	100'F	1445	1545	M.	-	64.4	280	20 (12)	-	-	-	239
685	11/8	28-51.2	89-18.8	40	100'F	1627	1727	M.	-	67.1	298	61 (15)	-	-	-	224.5
687	11/9	29-07.3	88-55	50	40'F	1735	1735	M.	-	66.9	275	12 (13)	-	-	-	114
688	11/9	29-07.3	88-53	40	40'F	1750	1820	M.wh.G.	-	68	25	5 (12)	-	-	-	20
689	11/9	29-11	88-53.6	30	40'F	1900	1930	M.	-	69.8	18	3 (15)	-	4 (15)	-	11
690	11/9	29-13	88-55	25	40'F	1938	2028	aft.stk.M.	6	69.8	11	-	-	1	-	10
691	11/9	29-52.6	88-50.5	24	40'F	2025	2028	M.	-	72.0	44	-	-	-	-	11
692	11/13	30-09.5	88-29	7	40'F	1755	1825	S.	-	55.4	550	11 (18)	-	-	-	550
693	11/13	30-05	88-23.5	10	40'F	1922	1955	S.	-	68.5	231	-	1 only	-	-	231
695	11/14	29-45	87-12	100	40'F	1545	1615	G.gr.M.	-	100	-	-	-	-	-	100
696	11/14	29-44.2	87-08	120	40'F	1718	1748	M.	-	67.8	27	-	-	-	-	52
697	11/14	30-04.3	86-57.5	50	40'F	2130	2200	M.	-	63.5	74	1 (12)	-	-	-	69
698	11/15	30-03.6	86-55.6	55	40'F	1510	1540	gr.en.M.	-	63	80	2 only	-	-	-	29
699	11/15	30-05	86-52.5	52	40'F	1645	1715	M.	-	64	19	2 only	-	-	-	12
700	11/15	30-07.4	86-50	40	40'F	1807	1837	M.	-	65.1	28	-	-	-	-	24
701	11/15	30-02	86-45	56	40'F	1930	2000	M.	-	61.7	61	3.5 (6)	-	-	-	52
702	11/15	30-02	86-45	56	110'B	2050	2120	M.	6	61.7	17.5	1.5 (4)	-	-	-	8
703	11/15	30-00	86-45.5	60	40'F	2200	2209	M.	-	72.6	0	-	-	-	-	-
704	11/16	29-21.4	86-21	15	40'F	0915	0945	S.G.	-	61.6	6	-	-	-	-	-
705	11/16	29-24	85-51	20	140'F	1330	1400	S.wh.G.	-	73.6	15	-	-	-	-	3
706	11/16	29-37.3	86-03	30	40'F	1505	1535	wh.S.	-	70.2	397	5 only	-	-	-	-
707	11/16	30-40.7	86-16.6	40	40'F	1627	1657	S.G.	-	69.8	44	-	-	-	-	-
708	11/16	29-46	86-52.8	40	40'F	1837	1927	M.S.	-	59.9	16	-	-	-	-	15
709	12/2	28-44.6	89-00	300-350	40'F	2145	0045	M.	-	-	-	-	-	-	-	-
710	12/7	28-18	91-48	20	110'B	1820	2050	gr.M.S.	-	78	725	-	142 (15)	-	-	383
711	12/7	20-21	91-45	20	110'B	2310	2310	gr.M.	-	78	691	-	130 (17)	-	-	561
712	12/8	20-21	91-45	20	110'B	0010	0240	gr.M.	-	77	-	-	-	-	-	-
713	12/8	20-05.6	91-33	12	100'F	1810	2040	G.	-	76.6	672	-	-	-	-	492
714	12/8	20-05.6	91-33	12	100'F	2055	2325	gr.M.wh.S.	-	76.6	928	-	224 (14)	-	-	714
715	12/8	20-05.6	91-33	12	100'F	2340	0210	gr.M.wh.S.	-	76.4	610	-	223 (13)	-	-	610
716	12/9	20-05.6	91-33	12	100'F	0240	0510	gr.S.	-	76.6	749	-	137 (14)	-	-	612
717	12/9	20-05.6	91-34	12	100'F	0745	2015	wh.S.G.	-	76.6	581	-	173 (15)	-	-	628
718	12/9	20-05.6	91-34	12	100'F	2030	2300	wh.S.G.	6	77	40	-	152 (13.5)	-	-	408
719	12/10	19-54.1	91-43	23	40'F	0315	0345	gr.S.	-	75	30	5	-	-	-	20
720	12/11	20-12	91-40	20	40'F	1855	1955	G.M.	-	76.6	97	-	25 (19)	-	-	72
721	12/11	20-20	91-28	17	40'F	0930	0930	gr.S.	-	76.6	185	-	37 (14)	-	-	108
722	12/12	20-34	91-36	20	40'F	0110	0110	G.	-	76.6	36	-	77	36	-	714
723	12/12	20-48.2	91-45.7	25	40'F	0305	0305	gr.M.	-	76.4	51	-	14.5 (10)	-	-	405
724	12/13	22-16	89-03	265	40'F	0005	0105	M.	-	76	7	-	-	-	-	-
725	12/13	22-15	89-05	25	40'F	0245	0245	wh.S.	-	76	25	-	-	-	-	25
726	12/13	22-41.9	86-41.2	225	40'F	1725	1755	wh.S.Co.	-	47.7	26	3 only	-	-	-	26
727	12/16	28-44	85-01	30	40'F	1352	1422	wh.S.G.	-	69.4	10	-	-	-	-	25
728	12/16	28-44	85-01	25	40'F	1550	1620	wh.S.G.	-	68	27	-	-	-	-	27
729	12/16	28-44	85-01	20	40'F	1610	1610	wh.S.G.	-	67.6	62	-	-	-	-	62
730	12/16	29-10	85-01	16	40'F	1853	1923	gr.S.M.	-	66	8	-	-	-	-	-
731	12/16	28-56.5	85-18	40	40'F	2335	2205	S.G.Sh.	-	66	4	-	-	-	-	-
732	12/17	28-50.8	85-28	37	40'F	0722	0822	G.S.Sh.	-	63	43	-	-	-	-	43
733	12/17	28-56	85-43	88	40'F	0955	1025	wh.M.S.	-	59	4	-	-	-	-	-
734	12/17	29-15	86-38.9	215	40'F	1630	1730	M.	3	52.5	0	-	-	-	-	-
1953																
795	6/12	29-15	87-49	230-300	40'F	1200	1235	-	-	-	64.5	-	-	-	23 (17.5)	25.9
796	6/12	29-10	87-55	490-600	40'F	1340	1520	-	-	-	-	-	-	-	-	15.5
844	10/6	28-58	88-00	830-930	40'F	0830	1045	-	-	-	1.5	-	-	-	-	-
842	10/22	29-05	88-40	9-10	40'F	1500	1530	bu.M.S.	-	67	28	-	-	-	-	28
843	10/22	29-22	88-40	8	40'F	2030	2100	aft.M.	-	80.6	123	22 (16)	-	-	-	97
844	10/23	29-18	88-45	33	40'F	0915	0945	aft.M.	-	82	128	2 (17)	-	-	-	126
845	10/23	28-58	89-45	33	40'F	1420	1450	bu.M.S.	-	80.2	138	34 (19)	-	-	-	79
847	10/24	28-44	89-33	53	40'F	0955	1035	bu.M.S.	-	60.8	93	-	-	-	-	89
848	10/24	28-53	89-33	36	40'F	1310	1340	bu.M.	-	79.8	270	29 (18)	-	-	-	279
849	10/24	28-53	89-36	10	40'F	1515	1605	bu.M.	-	80.2	60	2 (20)	-	-	-	59
850	10/25	28-56	89-09	32	40'F	1330	1405	aft.bu.M.	-	68	12	-	-	-	-	-

Fishing Log--1952-54 Trawling Stations, M/V Oregon (Continued)

STATION	DATE 1953	NORTH LATITUDE	WEST LONGITUDE	DEPTH IN FATHOMS	GEAR USED	DRAGGING TIME START FINISH	BOTTOM TYPE	GEAR DAMAGE	BOTTOM TEMP.	TOTAL CATCH	SRIMP	CATCH IN LBS. (HEADS-ON COUNT)				SCRAP
		BROWN	PINK	WHITE	RED											
853	10/26	29-11	88-55	20	40°F	0845	0900	bu, M.S.	-	78	8	4 (24)	-	-	-	-
854	10/28	30-08	88-25	9	40°F	1200	1230	ft, M.S.	-	75	185	-	-	4 (24)	-	-
855	10/28	30-10	88-10	10	40°F	1335	1405	S.	-	76	9	-	-	-	-	24
856	10/29	30-10	87-37	8	40°F	1005	1030	S, Sh.	-	73	4	-	-	-	-	4
857	10/29	30-10	87-37	12	40°F	1045	1110	S, Sh.	-	75	5	-	-	-	-	4
858	10/29	30-05	86-55	52	40°F	1430	1500	bu, M.	-	59	17	-	-	-	-	17
859	10/30	29-22	85-30	16	40°F	1238	1253	G.S, Sh.	-	60	420	-	-	-	-	-
860	10/30	29-22	85-30	16	40°F	1334	1349	G.S, Sh.	-	65	210	-	1 (25)	-	-	-
861	10/30	29-22	85-28	15	40°F	1433	1447	G.S, Sh.	-	75.5	60	-	-	-	-	60
862	10/30	29-30	85-22	10	40°F	1555	1610	Sh.	-	72	25	-	-	-	-	25
863	10/31	29-35	85-13	6	40°F	0900	0915	G.M.S.	-	72	24	-	3 (50)	.5 (15)	-	-
864	10/31	29-39	86-06	82	40°F	1540	1610	G.M, Sh.	-	55	38	-	-	-	-	38
866	11/2	29-21	86-22	33	40°F	1300	1324	gr, M.	-	72.5	60	7 (15)	-	-	-	53
869	12/8	30-06	88-00	11	40°F	0900	0915	S.	-	66	40	-	-	-	-	39
870	12/8	29-55	87-50	15	40°F	1817	1837	S.	-	68.7	56	1 only	-	-	-	56
871	12/8	30-00	87-30	15	40°F	2040	2055	S.	-	67.5	86.5	-	-	-	-	86.5
872	12/8	30-00	87-15	15	40°F	2230	2245	S.	-	67.6	46	-	-	-	-	46
873	12/9	30-00	87-08	23	40°F	0745	0800	S, Sh.	-	68	35	-	-	-	-	-
874	12/9	30-00	87-03	28	40°F	0828	0845	S, G.	-	69	4	-	-	-	-	61
875	12/9	30-00	86-57	60	40°F	-	-	gn, M.S.	-	59	-	-	-	-	-	-
1954																
876	2/16	29-44	87-47	21	40°F	1125	1130	gr, S.	-	63.9	45	-	-	-	-	-
877	2/16	29-33	87-47	24	40°F	1310	1335	gr, S.	-	65.3	7	-	-	-	-	-
878	2/16	29-30	87-46	30	40°F	1355	1430	gr, S.	-	67	27	-	-	-	-	-
879	2/16	29-25	87-45	30	40°F	1455	1535	gr, S.	-	65.3	40	-	-	-	-	-
880	2/16	29-23	87-43	30	40°F	1540	1555	S.	2	65.3	2	-	-	-	-	-
881	2/17	30-10	87-50	5.5	40°F	0735	0815	-	-	62	70	-	-	-	-	-
882	2/17	30-10	87-50	5.5	40°F	0820	0855	-	-	61.7	50	-	-	-	-	-
885	3/3	30-12	88-38	7.5	75#	1425	1900	ft, M.	-	67.6	120	-	1 only	-	-	120
884	3/5	30-12	88-38	7.5	75#	1910	1735	S, M.	-	68.4	10	-	1 only	-	-	-
887	3/4	29-35	88-33	19-20	75#	1125	1235	ft, M.	-	62.6	693	13 (11)	-	-	-	-
888	3/4	29-35	88-33	19	80#	1835	2100	-	-	63.1	119.5	-	-	-	-	-
889	3/7	29-27	88-54	19	40°F	1013	1035	Sh, G.	-	61.8	6.5	-	-	-	-	8.5
890	3/7	29-27	88-54	19	40°F	1030	1150	Sh, G.	-	61.8	0	-	-	-	-	-
891	3/7	29-00	85-02	21	40°F	1236	1300	-	-	61.7	20	-	-	-	-	-
892	3/7	28-55	85-07	29	40°F	1352	1425	-	-	61.3	39	-	-	-	-	-
893	3/7	28-49	85-12.5	48	40°F	1513	1536	-	-	61.8	10	-	-	-	-	-
894	3/7	28-45	85-12	48	40°F	1541	1648	-	-	60.3	38	-	-	-	-	-
895	3/7	28-47	85-19	64	40°F	1820	1845	-	-	62.6	6	-	-	-	-	-
896	3/7	28-50	85-06	55	40°F	2020	2045	-	-	61.7	84	-	-	-	-	-
897	3/7	28-50	85-00	28	40°F	-	-	Sh.	-	62.6	124	-	-	-	-	124
898	3/8	29-12	84-33	17	40°F	0340	0827	-	-	60.4	23	-	-	-	-	84
899	3/8	29-32	84-34	16	40°F	0512	0549	-	-	60.4	34	-	-	-	-	-
900	3/8	29-36	84-31	9	40°F	0700	0730	Sh, gr, S, Co.	-	59	12	-	-	-	-	12
901	3/9	29-38	84-15	11	40°F	1300	1310	bu, gr, S, Co.	6	71.6	114	-	-	-	-	114
902	3/9	29-28	84-05	13-12	40°F	1535	1557	Co, Sp, S.	6	65.3	37	-	-	-	-	37
903	3/9	29-25	84-12	13	40°F	1820	1855	Co, Sp, S.	6	59.9	215.5	-	-	-	-	215.5
904	3/9	29-17	84-12	14	40°F	1825	1855	Co, Sp.	6	60.8	337.5	2 ea, (20)	-	-	-	337.5
905	3/9	29-02	84-13	15	40°F	2000	2110	-	-	61.3	12	-	2 (20)	-	-	-
906	3/9	29-05	84-03	14	40°F	2230	2355	Co, G.	-	62.2	167	-	-	-	-	167
907	3/10	29-04	83-51	12	40°F	0122	0142	-	-	61.3	6	8 ea, (15)	-	-	-	6
908	3/10	29-06	83-50	12	40°F	0222	0233	-	-	61.3	3	-	-	-	-	3
909	3/10	29-06	83-42	11	40°F	0330	0351	-	-	59	100	13 ea, (15)	-	-	-	100
910	3/10	28-52	83-36	8	40°F	0227	0255	Sh, Co.	-	60.4	16	-	11 ea, (15)	-	-	-
911	3/10	28-52	83-42	13	40°F	0700	0720	S, Sh, Co, M, G.	-	61.7	16	-	-	-	-	-
912	3/10	28-42	83-56	17	40°F	1100	1130	S, Sh, Co, M, G.	-	62.6	6	-	-	-	-	6
913	3/10	28-42	84-00	17	40°F	1327	1405	Co, S, Sh.	-	61.7	16	-	-	-	-	16
914	3/10	28-45	84-07	16	40°F	1350	1329	Co, Sp.	6	63.7	0	-	-	-	-	0
915	3/10	28-33	84-34	28	40°F	1635	1655	Sp, Co.	-	63.1	4	-	-	-	-	4
916	3/10	28-23	84-49	37	40°F	1900	1930	Co.	-	64.4	20	-	-	-	-	20
917	3/10	28-22	84-53	48	40°F	2100	2130	Co, S, G.	-	62.6	10	-	-	-	-	10
918	3/10	28-20	84-54	50	40°F	2300	2345	Co, H.	-	63.7	4.5	-	-	-	-	4.5
919	3/11	28-15	83-25	60	40°F	0920	0930	Co, Sp.	6	60.3	69	-	-	-	-	69
920	3/11	28-09	84-54	80	40°F	0205	0330	Co, H.	-	62.6	50	-	-	-	-	50
921	3/11	28-11	84-19	34	40°F	0840	0823	Co, S, G.	-	66.2	16	-	-	-	-	16
922	3/11	28-27	84-30	34	40°F	0937	1020	Co, H.	-	63.7	7	-	-	-	-	7
923	3/11	28-24	84-24	28	40°F	1320	1353	S, Sh.	-	61.2	13	-	-	-	-	13
924	3/11	28-31	84-03	21	40°F	1432	1514	Co.	7	62.6	7	-	-	-	-	7
925	3/11	28-31	83-51	18	40°F	1645	1720	S, Co.	-	63.1	102	-	-	-	-	102
926	3/11	28-24	83-46	17	40°F	1900	1930	S, Co.	-	61.9	151	-	-	-	-	151
927	3/11	28-22	83-38	15	40°F	2130	2153	S, Co, Sp.	6	61.9	1315	-	-	2 ea,	-	1315
928	3/11	28-19	83-30	14	40°F	2200	2215	S, Co, H.	-	62.4	4	5 ea,	-	-	-	4
929	3/11	28-13	83-24	12-14	40°F	2330	2400	Co, Sp, S.	-	61.9	35	-	-	-	-	35
930	3/12	28-06	83-19	14	40°F	0607	0108	S, Co, Rk.	-	62.6	6	-	1 only	-	-	6
931	3/16	27-44	82-47	4	40°F	1125	1132	S, Sh, Co.	-	61.2	34	-	1 (20)	-	-	-
932	3/16	27-30	82-45	4	40°F	1338	1333	S, Sh.	-	62.2	4	-	4 ea, (25)	-	-	4
933	3/18	27-36	83-18	20	40°F	1000	1030	gr, M.	-	63	12	-	-	-	-	-
934	3/18	27-36	83-30	23	40°F	1155	1235	Co, S, Sp.	-	63.7	5	-	-	-	-	5
935	3/18	27-36	83-40	27	40°F	1320	1400	Co, S, Sp.	-	65.8	2015	-	-	-	-	2015
936	3/18	27-36	83-50	32	40°F	1315	1362	Co, S, Sp.	-	65.1	13	-	-	-	-	13
937	3/18	27-30	84-11	38	40°F	1755	1815	Co.	-	64.9	26	-	-	-	-	26
938	3/18	27-36	84-26	58	40°F	2000	2035	Sp.	-	67.3	15	-	-	-	-	15
939	3/18	27-09	84-22	32	40°F	2300	2330	Sh, Co, Sp.	-	64.4	17	-	-	-	-	17
940	3/21	28-06	84-16	21	40°F	0225	0315	-	-	63.3	8	-	-	-	-	8
941	3/21	29-57	86-22	35	40°F	1445	1445	gr, M.S.	-	63.5	5	-	-	-	-	5
942	3/21	29-54	86-25	39	40°F	1532	1620	S.	-	65.6	4	-	-	-	-	4
943	3/21	29-53	86-27	40	40°F	1655	1738	S.	-	62.6	43	-	-	-	-	43
944	3/21	29-46	86-30	50	40°F	2000	2030	G.M.S.	-	62	60	5 ea, (10)	-	-	-	60
945	3/21	29-48	86-37	67	40°F	2100	2200	gn, M.	-	62.2	7	1 ea, (5)	-	-	-	68
946	3/22	29-41	86-44	100	40°F	2230	2300	H.	-	59	276	-	-	-	-	270
947	3/22	29-30	86-56	190	40°F	0100	0400	gr, gn, M, S.	-	51.8	212	-	-	-	-	210

Note: Table continued on following page.

Fishing Log--1952-54 Trawling Stations, M/V Oregon (Continued)

STATION NUMBER	DATE 1954	NORTH LATITUDE	WEST LONGITUDE	DEPTH IN FATHOMS	GEAR USED	DRAUGHT TIME		BOTTOM TYPE	GEAR DAMAGE	BOTTOM TYP.	TOTAL CATCH IN LBS.	SPECIES CATCH IN LBS. (WEIGH-OR-COMP)			SCRAP
						START	FINISH					BROWN	PINK	WHITE	
948	3/22	29-30	87-12	210	40' F	0700	0800	K.	6	52.7	12	-	-	4 ea. (15)	12
1004	4/13	24-25	86-55	71	40' F	1240	1330	Sp., Sh.	-	76.1	135	-	-	-	135
1005	4/13	24-30	83-20	210	40' F	1545	1655	gn. Cl. M.	-	50	295	-	7 ea. (25)	-	120 (20)
1006	4/13	24-20	83-20	190	74' B	1815	2110	Co. M.	-	51.4	240	-	-	-	40 (20)
1007	4/13	24-26	83-24	180	74' B	2235	0035	gn. Cl. M.	-	50.9	280	-	-	-	180 (20)
1008	4/14	24-10	83-30	180-200	74' B	0130	0230	M. B. Co.	3	49.1	13	-	-	-	10 (15)
1009	4/14	24-34	83-34	300	40' B	0430	0730	Wh. Co. M.	-	52.7	90	-	-	-	35
1010	4/14	24-35	83-40	225	40' F	0815	1105	Co. M.	-	49.1	60	-	-	-	11 (20)
1011	4/14	24-28	83-25	200	40' F	1520	1800	Co. M.	-	49.1	460	-	-	-	180 (20)
1012	4/14	24-19	83-20	180	40' F	1910	2200	Co. M.	-	49.3	75	-	-	-	20 (20)
1013	4/15	24-22	83-05	100	40' F	2305	0055	gn. M.	1	49.5	0	-	-	-	45
1015	4/16	24-20	83-20	150-350	40' F	0825	1105	Co. M.	-	67.5	206	-	-	-	20 (20)
1016	4/16	24-22	83-18	200	40' F	1135	1330	Cl. M.	-	90	135	-	-	-	75 (20)
1017	4/16	24-22	83-18	200	40' F	1430	1630	M.	-	90	0	-	-	-	25
1018	4/16	24-16	83-22	375	40' F	1755	2115	Co. M.	-	0	0	-	-	-	0
1019	4/16	24-16	83-22	375	40' F	2235	0035	M.	-	22	0	-	-	-	22
1020	4/19	24-47	83-18	35	40' B	0710	0740	Co. M., Sh.	-	66.2	85.5	-	-	-	85.5
1021	4/19	24-54	83-25	38	40' B	0910	0950	Co. M., Sh.	-	66.2	366.5	-	-	-	366.5
1022	4/19	24-59	83-35	39	40' B	1045	1130	Co. M., Sh.	-	66.6	1015	-	-	-	1015
1023	4/19	25-09	83-48	52	40' B	1340	1350	S. G. Sp.	-	67.1	2.5	-	-	-	2.5
1024	4/19	25-13	83-55	65	40' B	1515	1545	S. G.	-	68.4	19	-	-	-	19
1025	4/19	25-12	84-05	75	40' B	1650	1810	S. G.	-	64.9	6.5	-	-	-	6.5
1026	4/19	25-19	84-19	163	40' F	1950	2200	S. G.	-	66.9	232	-	-	-	232
1028	4/21	28-28	87-18	780	40' F	2103	0315	-	-	0	0	-	-	-	0
1048	5/13	21-17	91-18	20	40' F	1905	1930	N. Co.	-	78.4	40	-	3.5 (10)	-	36.5
1049	5/13	21-14	91-28	25	40' F	2045	2115	N. Co.	-	78.4	24	-	.5 (12)	-	23.5
1050	5/13	21-19	91-41	28	40' F	2255	2340	N. Co.	-	75.7	35	-	11.5 (10)	-	23.5
1054	5/15	19-37	92-40	300	40' F	1650	1825	Wh. M.	-	52.5	34.5	-	-	.5 (14)	27
1055	5/15	19-14	93-00	225	40' F	2125	2325	gr. M. Cl. M.	-	50	7.5	-	-	2 ea. (10)	7
1056	5/16	18-50	93-05	20	40' F	1328	1435	gr. M.	-	76.3	0	-	-	-	0
1057	5/16	18-10	93-15	19	40' F	1532	1600	gr. M.	-	76.5	20.5	1 (12)	-	-	19.5
1058	5/16	18-45	93-20	22	40' F	1642	1750	gr. M.	-	75.1	19.5	1.5 (10)	-	-	18
1059	5/16	18-43	93-29	25	40' F	1855	1910	gr. M.	-	72.7	7	1 ea. (8)	-	-	7
1060	5/16	18-43	93-30	35	40' F	2015	2060	gr. M.	-	70.2	16.5	8 (10)	-	-	10.5
1061	5/16	18-44	93-33	45	40' F	2120	2200	gr. M.	-	0	0	-	-	-	0
1080	6/2	26-09	97-05	11	40' F	0815	0845	gr. M.	-	78.6	8	-	-	-	8
1081	6/2	26-10	96-59	15	40' F	0925	1005	gr. M.	-	75.6	13.5	4 ea. (35)	.5 (24)	-	13
1082	6/2	26-11	96-52	23	40' F	1038	1130	gr. M.	-	75.4	14	-	1 (12)	-	13
1083	6/2	26-13	96-45	23	40' F	1215	1235	gr. M.	-	72.5	9.5	.5 (12)	-	-	9
1084	6/2	26-15	96-38	26	40' F	1320	1350	gr. M.	-	72.5	14.5	.5 (10)	-	-	14
1085	6/3	26-10	97-00	11	40' F	0600	0710	gr. M.	-	75.3	41.5	-	1 (18)	-	40.5
1086	6/3	26-10	96-54	18	40' F	0840	0954	gr. M.	-	75.2	77	2 (12)	-	-	46
1087	6/3	26-10	96-40	29	40' F	1405	1515	gr. M.	-	71.1	45.5	1.5 (12)	-	-	44
1088	6/3	26-10	96-29	40	40' F	1705	1750	gr. M.	-	71.6	2	1 (12)	-	-	24
1090	6/4	26-10	96-22	50-60	40' F	0505	0525	br. M.	2	68.7	0	-	-	-	0
1091	6/4	26-46	96-20	200-210	40' F	1110	1545	br. M.	-	60	0	-	-	-	2 (16)
1092	6/4	26-53	96-20	210	40' F	1725	2000	K.	6	0	0	-	-	-	0
1093	6/4	27-03	96-16	210	40' F	2215	2400	br. M.	-	42	0	-	-	2 ea. (16)	42
1094	6/5	27-10	96-20	150	40' F	0615	0715	br. M.	-	53.6	16	-	-	-	16
1095	6/5	27-10	96-17	175	40' F	0853	0900	gr. br. M.	1	0	0	-	-	-	0
1096	6/5	27-20	96-12	100-125	40' F	1000	1055	gr. M.	6	59.4	18	-	-	-	18
1097	6/5	27-20	96-30	85	40' F	1200	1350	gr. M.	6	0	0	-	-	-	0
1106	6/15	29-02	88-35	225	70' B	0833	0933	gn. M.	-	50.4	35	-	-	6.5 (12)	22
1107	6/15	29-03	88-25	210-235	74' B	1045	1235	gn. M.	-	48.7	184	-	-	15 (14)	169
1108	6/15	29-18	88-45	34	74' B	1525	1740	gn. M.	-	71.2	134	.5 (10)	-	-	133.5
1109	6/15	29-22	88-48	18	74' B	1945	2205	gr. M.	-	71.1	78.5	9 (15)	2 (15)	-	66.5

Gear Used--Abbreviations:

40' F - 40' flat shrimp trawl.

40' B - 40' balloon

70' B - 70' shrimp trawl.

80' B - 80' shrimp trawl.

100' F - 100' flat shrimp trawl.

110' B - 110' balloon shrimp trawl.

Bottom Type--Abbreviations:

Cl. - Clay

Co. - Coral

G. - Gravel

M. - Mud

Rk. - Rock

S. - Sand

Sh. - Shells

Sp. - Sponge

Br. - Black

Bk. - Brown

Bu. - Blue

Gn. - Green

Gv. - Gray

Wh. - White

Hrd. - Hard

Rky. - Rocky

Sft. - Soft

Stk. - Sticky

Gear Damage--Symbols:

1 - Complete loss of gear.

2 - Complete loss of net only.

3 - Complete loss of webbing.

4 - Tail only saved.

5 - Partial loss of webbing, tail saved.

6 - Netting ripped.

7 - Net saved by lazy-line.

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OBSERVATION OF JAPANESE HIGH-SEAS SALMON GILL-NET FISHERY OFF HOKKAIDO

By C. E. Atkinson*

The salmon runs along the North American Pacific Coast have been exploited for almost a century by the fishermen of Japan, Russia, Canada, and the United States. Originally the fisheries were confined to the coastal waters and the rivers through which the adult salmon must pass during spawning migration. But in recent years, exploitation of the salmon resources on the high seas has been increasing.

On the other hand, in Japan only a limited number of salmon ascend the streams of Hokkaido and northern Honshu and for many years their industry depended upon the lease of shore stations in Soviet Russia.

In 1936 Japanese interests found it difficult to obtain desirable fishing sites in Kamchatka and the Kurile Islands and turned to the high seas in order to sustain their salmon fisheries (Anonymous 1937). The salmon fisheries on the high seas have been described in part by Fukuhara and others (1953), and observations recently made off Hokkaido at the invitation of the Japanese Government provided additional information on the high-seas salmon fishing method developed by the Japanese, especially the importance of water temperatures.

Tonnage	36.4 gross tons
Length	64.0 feet
Width	14.1 feet
Draft	6.4 feet
Engine (Diesel)	120 N. P.
Maximum speed	13½ knots
Crew	13

The author on May 31 and June 1, 1954, accompanied the research vessel Oyasio Maru, comparable in size to the commercial fishing boats now operating far offshore. The specifications of the Oyasio Maru are given in table 1. As a research boat the Oyasio Maru devotes almost its entire effort to determining where fish may be found in abundance and in perfecting means of catching those fish most efficiently. The fish caught are sold to the local markets to help defray the operating costs.

All fishing is done by gill nets made up of a number of single nets, each 80 meters (262.4 feet) long and 6 meters (19.5 feet) deep with a mesh size of 4½ inches stretched. The individual nets are fastened together to form a single gill net which in this case totaled 94 units or about 4½ miles in length. Only 10 nets were of ramie (a Japanese grass similar in texture to linen) while 84 were of nylon. The nets were hung in a manner similar to that described by Fukuhara.

Drawing on years of experience, the Japanese have concluded that salmon in the ocean are most abundant in areas of rapid temperature change, and prefer temperatures of from 7° to 8° C. (44° to 47° F.). The cruise of the Oyasio Maru demonstrates well the importance of temperature to the fishing operation. Beginning at the time of leaving Kushiro, surface water temperatures were taken every half hour, indicating first the location of the cold northern current, then the warmer waters of the "Kuroshio" (fig. 1).

A suitable surface water temperature was found at 4:30 p.m. about 120 miles southeast of Kechiro. The main fishing area was reported by radio to be about 100 miles further offshore (as indicated in fig. 1) in waters of similar temperature conditions.

*Chief, Pacific Salmon Investigations, Branch of Fishery Biology, U. S. Fish and Wildlife Service, Seattle, Wash.

Note: The author gratefully acknowledges the help of Mr. M. Ohto of the Japanese Fisheries Agency, Mr. T. Myata of the Nippon Suisan Company, and Mr. M. Miyako, Captain of the Oyasio Maru, in arranging for this cruise.

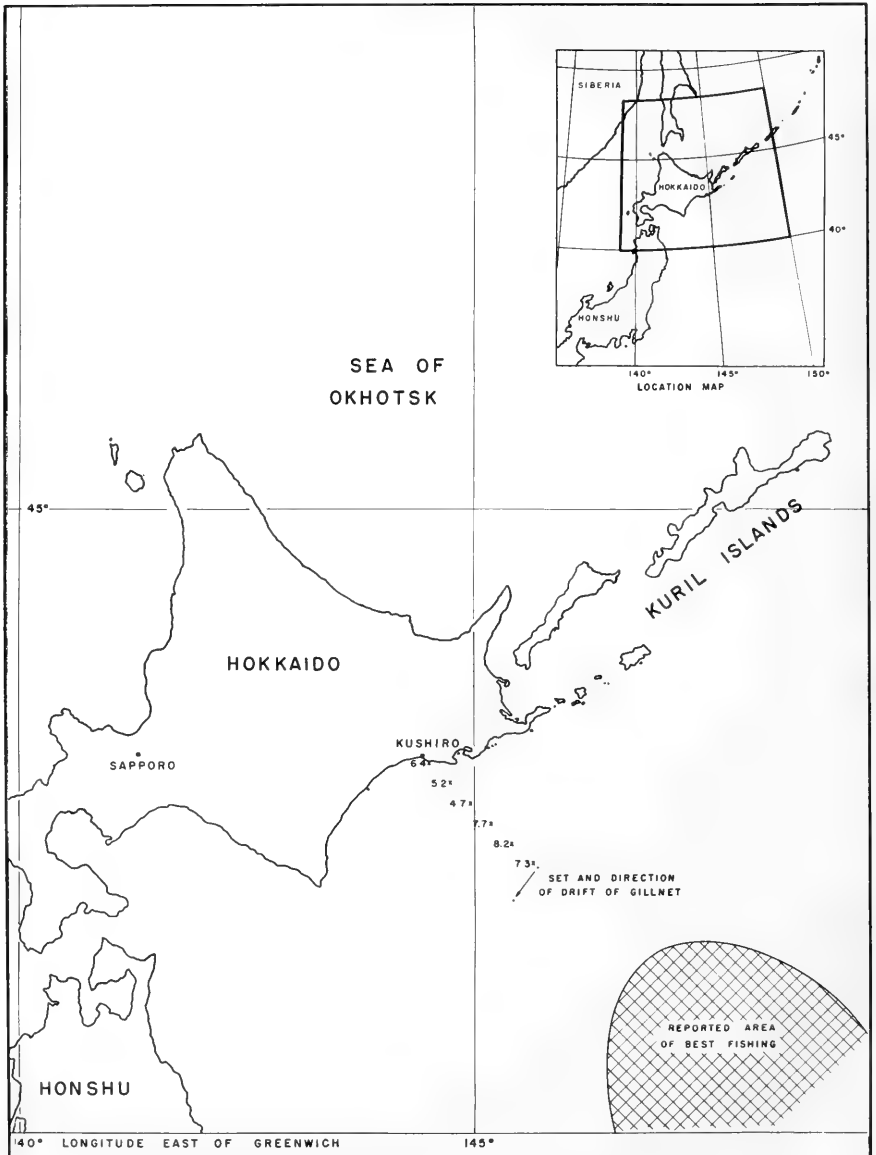


Fig. 1 - Map of Hokkaido showing fishing site and relation to surface water temperature.

Vertical temperatures at the fishing site were determined by reversing thermometers. Relatively warm water-- 6.2° to 7.3° C. (43° to 45° F.)--was found in the upper 15 meters, the temperature becoming much colder-- 3.2° to 3.6° C. (37° to 38° F.)--at the 25- and 50-meter levels (fig. 2). From vertical plankton hauls, food appeared to be more abundant in the upper warmer layer.

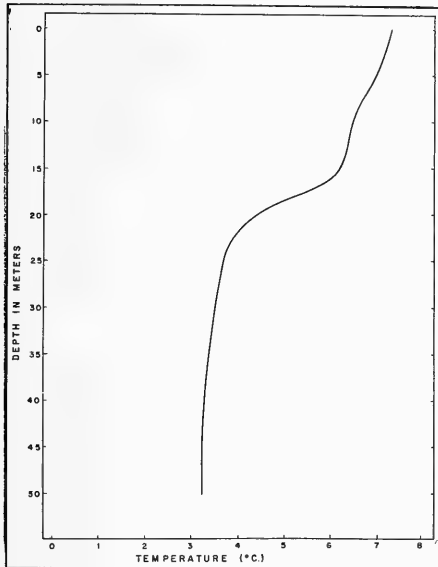


Fig. 2 - Vertical water temperatures at salmon fishing site off Kushiro.

The net, which had been carefully stacked on the rear deck, was set by passing over a roller at the stern while the boat was under way. The net fished from 6 p. m. to 1 a. m.

To lift, two men pulled the net in over the port side of the forward deck immediately below the wheelhouse, one man took out the fish, and two men straightened the net. The net was then passed along the starboard side on rollers to the rear deck where it was carefully restacked. It was nearly 4 a. m. before the operation was complete.

A total of 76 chum salmon and 10 pink salmon were taken during the night's fishing--a catch considered to be quite satisfactory commercially.

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TRANSPARENT PLASTIC CAN

A new plastic transparent can has been developed in Germany which can be sealed hermetically. This can withstands heating up to 180° C. (356° F.), and is expected to revolutionize the canning industry.

--World Fisheries Abstracts, March-April 1953



FREEZING-FISH-AT-SEA OPERATIONS OF THE DELAWARE - (JUNE 29 TO AUGUST 24)

The Service's research trawler Delaware, operating out of East Boston, Mass., started its initial cruise of the season on June 29. This was its first trip since completion of repairs and restoration of the galley and after crew's quarters necessitated by the fire on the vessel last October. The purpose of the cruise was (a) to brine freeze in-the-round and store in the frozen-fish hold all commercial varieties of fish taken in the Georges Bank area; (b) to further test the operation of the freezing equipment, particularly in relation to certain automatic control valves that had been recently installed; and (c) to prepare sample lots of iced gutted fish of various species for use in projects under way in the laboratory.



Operating the brine freezer aboard the research trawler Delaware.

replacements were made in the equipment prior to making the second cruise.

The Delaware again went to sea on July 14. The purpose of this cruise was essentially the same as that for the first one. The vessel returned to the laboratory on July 27, after about 13 days. Fishing was done mostly in the Georges Bank area. The catch totaled approximately 50,000 pounds of fish, made up largely of haddock and scrod haddock, with the remainder being cod, whiting, ocean perch, and other mixed fish. About 43,000 pounds of this total were brine frozen in-the-round, and the remaining 7,000 pounds were gutted and iced.

The third test cruise began on August 9. It was made to obtain and freeze ocean perch for evaluation and storage tests and to prepare certain special lots of other varieties of fish. Some fishing was done in the Georges Bank area but because of a scarcity of fish of the species desired for experimental purposes the vessel proceeded to Browns Bank, off Nova Scotia. Fishing was continued in that area for the balance of the trip.

The vessel returned to Boston on August 24 after being at sea for a period of about 15 days. The catch totaled approximately 32,000 pounds of fish made up largely of ocean perch, haddock, and pollock. Cod, whiting, and mixed varieties made up the remainder of the catch. Approximately 22,000 pounds of the total were frozen at

The vessel returned to the East Boston laboratory on July 4. The catch totaled 11,500 pounds of fish, principally haddock, cod, and yellowtails. Approximately 2,500 pounds of this total were frozen.

While fishing was being carried out, mechanical equipment that was replaced or overhauled during the winter was tested under full operating loads. As a result of these sea trials, certain adjustments and

sea and maintained in a frozen condition in the vessel's cold-storage hold until unloaded. Recently-installed automatic controls on the freezing plant aboard the vessel operated quite satisfactorily, permitting the machinery to function with a minimum of attention by the plant operator.

The vessel crew consisted of about a two-thirds complement; therefore, the fishing operations were carried out only during the daylight hours. The proportionate catches, however, were considered satisfactory.

When landed, all of the brine-frozen fish were in excellent condition, whereas the iced fish, which were caught during the first part of each of the trips, were not of the best quality.

The second and third cruises demonstrated the feasibility of holding the fish aboard vessel in a frozen state for relatively long periods and landing the entire lot in excellent condition. By holding the fish in a frozen state, the vessel moved from areas of poor fishing to those in which fish were more plentiful, and still maintained the high quality of the entire catch.

A technologist from the Army Quartermaster Corps Food and Container Institute, Chicago, Illinois, was aboard the vessel during the three cruises for the purpose of preparing part of the catch of both iced and frozen fish for later use in the preparation of frozen fillets, fish squares, and fish sticks for consumer acceptance tests under the direction of the Institute. The laboratory staff assisted in handling the fish upon the arrival of the vessel at East Boston and in the processing of the fish into the desired types of samples.

On the first two cruises, lobsters were caught incidental to the trawling operations about 200 miles at sea and were placed in a tank of circulating sea water. Thirty-five lobsters, weighing up to 12 pounds each, were brought in alive. They were delivered to the Division of Marine Fisheries, Massachusetts Department of Natural Resources, Boston, Massachusetts, for tagging and releasing in inshore waters for studies on migratory habits and survival rates.

--S. R. Pottinger, Fishery Products Technologist,
Fishery Technological Laboratory,
Branch of Commercial Fisheries,
U. S. Fish and Wildlife Service,
East Boston, Mass.



KEEPING QUALITY OF FRESH SHRIMP

Fresh shrimp will have lost their characteristic sweet flavor after storage in ice for 7 days. During the next 9 days the progress of spoilage continues without development of marked off-flavors. Measurement of amino-nitrogen gives at this stage an indication of the extent of decline in quality of the shrimp.

--The Refrigeration Research Foundation
Information Bulletin, May 15, 1953.



TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

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

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

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

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



Alaska

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

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

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

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



Lowering sockeye salmon to hold of buyer.

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

poor runs at Chignik reported. The Copper River red salmon pack, though, was the largest on record.

In central Alaska, runs were about normal with good packs and escapements of pinks and chums at Kodiak. Red salmon runs, however, were only fair, with

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

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



California

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

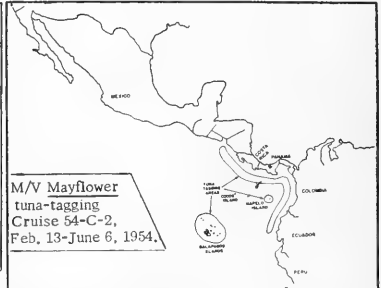
This is the second straight year that all applications to reduce California sardines into commercial oils and meal have been refused by the State. Reduction of whole fish is the only phase of the State's fishing industry over which the Commission has regulatory control.

* * * * *

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

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

Record of Tuna Tagged by <u>Mayflower</u> , February 13 to June 6, 1954				
	Yellowfin Tuna	Skipjack Tuna	Big-eyed Tuna	Total
	.. (Number of Fishes Tagged) ..			
Nicaragua	9	128	-	137
Costa Rica	144	63	-	207
Malpelo Is.	7	6	-	13
Panama	6	0	-	6
Colombia	187	155	-	342
Ecuador	76	370	-	446
Galapagos Is.	302	347	22	671
Grand total	731	1069	22	1822



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

* * * * *

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

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

* * * * *

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

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

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



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



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

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



Federal Purchases of Fishery Products

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

Purchases of Fresh and Frozen Fishery Products by Department of the Army (July and the First Seven Months of 1954)							
QUANTITY				VALUE			
July		January-July		July		January-July	
1954	1953	1954	1953	1954	1953	1954	1953
Lbs.	Lbs.	Lbs.	Lbs.	\$	\$	\$	\$
1,869,757	2,465,620	13,907,439	16,065,538	661,893	838,801	5,750,214	6,844,252

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

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



Great Lakes Fishery Investigations

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

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

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

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

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



Gulf Exploratory Fishery Program

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

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

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

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

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

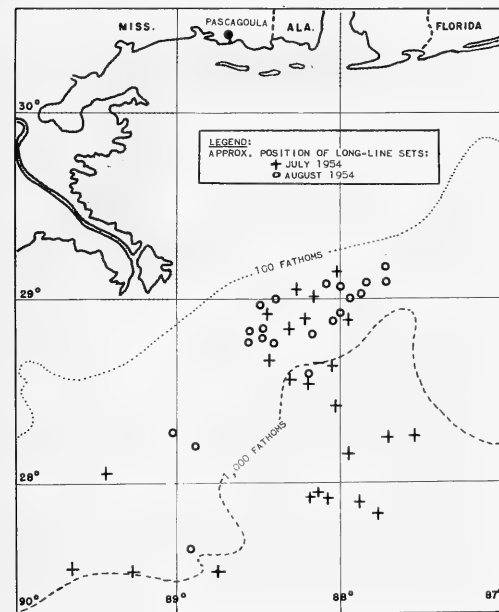
Thirty-five baskets (9 hooks per basket) of Japanese-type long-line gear were used on the first 7 sets. Five experimental baskets of hemp main line were then removed due to the excessive twisting of the main line which wrapped gangion and leader along the main line. An additional gangion was added to the remaining 30 baskets and two 30-basket (300 hooks) sets were made each day for the remainder of the trip. The gear was set as one continuous

line with 10 baskets set with 20-fathom float-to-main line droppers, 10 baskets with 10-fathom droppers, and 10 baskets with the floats attached to the main line. Mullet, squid, and cigarfish (*Decapterus punctatus*) were used as bait. The cigarfish were in poor condition but were by far the most effective bait.

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

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

The Oregon was scheduled to leave Pascagoula on August 10 on Cruise 25, returning August 31. The work outlined for this cruise is long-line tuna fishing in the central Gulf of Mexico. No specific area was designated but all fishing was to be done beyond the 500-fathom curve. One of the objectives is to test several types of



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

nylon, cotton, and hemp gangions and main line in an attempt to reduce breakage of gear which was excessive on the two previous cruises. Another objective for the cruise is to try to find the most productive depth of fishing and to determine the best time of day for sets to be made.

* * * * *

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

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

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

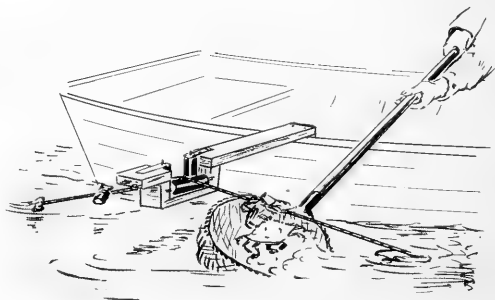
The Oregon went into port at Pensacola on August 20 to pick up additional gear. The original Japanese gear used since the beginning of the vessel's long-line fishing in 1954 had been previously used in other localities and was becoming too weak to be satisfactory. The new gear was effective in greatly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

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



Maryland

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



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

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

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

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

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

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



New England Bluefin Tuna Investigations

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

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

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



New York

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

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

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



Pacific Oceanic Fishery Investigations

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

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

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

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

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

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

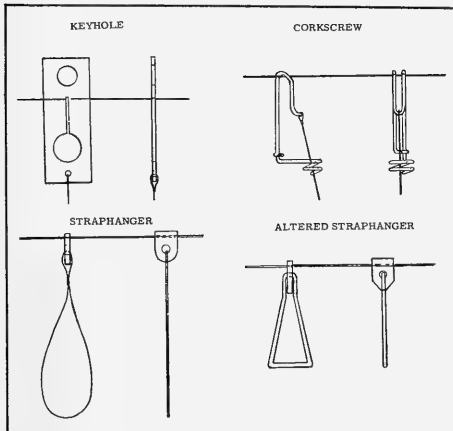
A surprisingly high percentage of the long line-caught yellowfin tuna were shark-eaten. The Oceanic lost 44 percent and the Brothers 50 percent to the sharks. Sharks were caught in great numbers.

* * * * *

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

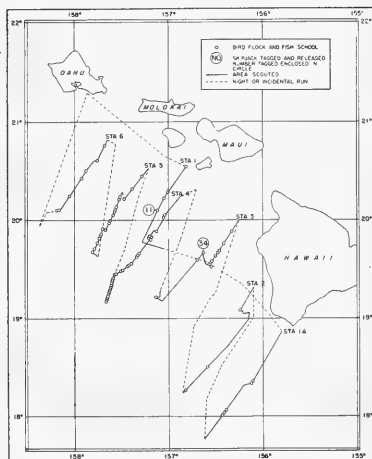
Standard surface trolling for tuna was attempted on all daylight runs. Eleven fishing hours produced no catch.

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

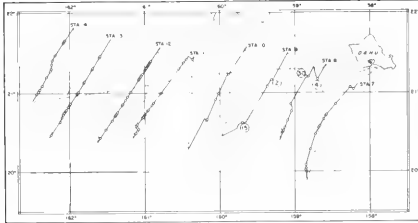
An exceptionally large concentration of schools of big fish was found about 20 miles north of Kalaupapa, Molokai. This was one of the cruises planned to provide information on the seasonal changes in the abundance of tuna schools around the islands, especially in those areas that are beyond the range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

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



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

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



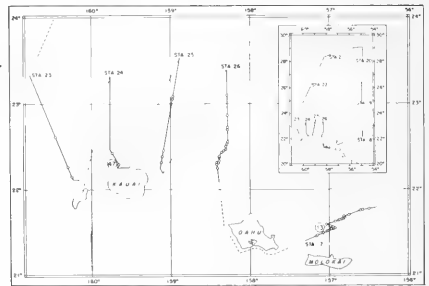
Cruise 16 (Part II) of the Charles H. Gilbert, Aug. 4-13, 1954.

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

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

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

Fourteen schools were chummed with live nehu (Hawaiian anchovy) and fish were taken from eight of these. A total of 156 skipjack were tagged with the California-



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

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

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

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

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

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

anese commercial fishing west of 180° shows that they also extend continuously to Asia.

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

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

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

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

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

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

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

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

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

spawning, and there is evidence that these tuna spawn more than once per season.

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

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

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

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

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

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

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

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

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

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

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

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

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

Hydrographic studies in Hawaiian waters revealed a semipermanent eddy system in the lee waters of the archipelago. These eddies exhibit seasonal fluctuations, being well developed during periods of strong, continuously blowing trade winds. The circulation features in the windward offshore waters are complicated and as yet little understood. Scouting revealed noteworthy concentrations of skipjack tuna schools around the peri-

phery of the eddies, about 100 miles offshore and outside the range of the local fishery. Tagging of skipjack tuna commenced with the plastic tube tag developed in California, and thus far 22 have been released, primarily outside the range of the local fishery. The migrations of the fish around the islands will be traced by this means.

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

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



States Get Over \$4 Million for Fish Restoration

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

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

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



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

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

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

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

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

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



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

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



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

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

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

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

^{1/}Preliminary.

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

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

Year	California			Atlantic Coast			Total		
	Quantity	Value to Cannerns	Cannerns' Avg. Price Per Std. Case ^{1/}	Quantity	Value to Cannerns	Cannerns' Avg. Price Per Std. Case ^{1/}	Quantity	Value to Cannerns	Cannerns' Avg. Price Per Std. Case ^{1/}
	Std. Cases ^{1/}	\$	\$	Std. Cases ^{1/}	\$	\$	Std. Cases ^{1/}	\$	\$
1953	2,596,231	25,038,512	8.45	2,102,515	20,447,574	8.11	4,698,746	45,486,086	8.28
1952	1,503,233	11,110,276	7.39	22,120	252,421	11.41	1,525,353	11,362,697	7.45
1951	1,032,581	6,066,011	5.87	15,937	193,213	12.12	1,048,518	6,259,224	5.97
1950	1,393,492	6,989,616	4.99	63,556	532,200	8.37	1,457,048	7,491,816	5.14
1949	916,610	5,766,415	6.29	133,117	1,082,515	8.13	1,049,927	6,848,930	6.52
1948	1,018,973	7,541,931	7.40	262,219	2,308,903	8.81	1,281,192	9,850,834	7.69
1947	1,477,198	12,571,059	8.51	277,752	2,447,574	8.81	1,754,950	15,018,633	8.56
1946	723,688	5,599,894	7.74	238,462	1,975,397	8.28	962,150	7,575,291	7.87
1945	638,191	3,590,614	5.63	54,557	456,077	8.36	692,748	4,046,591	5.84
1944	932,230	5,096,749	5.44	232,790	1,937,248	8.32	1,225,060	7,033,997	5.74
1943	831,660	4,379,996	5.27	105,591	891,207	8.44	937,251	5,271,203	5.62

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

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



U. S. Production of Selected Byproducts, 1953

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

Table 1 - U. S. Pack of Canned Animal Food From Fishery Products by States, 1953^{1/}

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

^{1/}Preliminary.

^{2/}Cases of various sizes converted to the equivalent of 48 cans, each can containing 16 ounces.

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

Table 2 - U. S. Pack of Canned Animal Food From Fishery Products by Size of Can and Case, 1953^{1/}

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

^{1/}Preliminary.

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

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

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

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

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

* * * * *



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

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

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

^{1/} Preliminary.

^{2/} Includes a small production of miscellaneous meal produced in Minnesota.

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



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

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

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

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

2/ Preliminary.

* * * * *

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

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

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

1/ Preliminary.

2/ Includes production of burbot-liver oil in Minnesota.

3/ Includes edible and industrial salmon oil.

4/ Includes ocean perch and unclassified body oils.

5/ Includes unclassified body oils.

6/ Combined with Pacific Coast production.

7/ Includes burbot, flounder, hake, halibut, pollock, swordfish, whale, mixed, and unclassified liver oils.

8/ Includes halibut, sablefish, swordfish, and mixed liver oils, and viscera oil.



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

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

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

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

Year	Body Oils			Liver Oils			Total	
	Quantity	Value to Mfrs.	Avg. Price Per Gallon	Quantity	Value to Mfrs.	Avg. Price Per Gallon	Quantity	Value to Mfrs.
	Gallons	\$	\$	Gallons	\$	\$	Gallons	\$
1953 ^{1/}	20,089,787	10,045,279	.50	204,331	1,436,627	7.03	20,294,118	11,481,906
1952	15,817,800	7,316,354	.46	276,609	2,075,014	7.50	16,094,409	9,391,368
1951	17,872,733	14,044,296	.79	299,575	2,579,947	8.61	18,172,308	16,623,643
1950	21,432,592	14,041,619	.66	331,257	3,431,090	10.36	21,763,849	17,472,709
1949	16,860,530	7,519,522	.45	834,357	9,845,455	11.80	17,694,887	17,364,977
1948	16,323,061	18,449,870	1.13	722,329	12,411,652	17.18	17,045,390	30,861,522
1947	15,900,382	20,107,194	1.26	832,510	11,643,468	13.99	16,732,892	31,750,662
1946	19,135,051	21,223,098	1.11	895,884	13,618,549	15.20	20,030,935	34,841,647
1945	23,697,564	16,033,515	.68	804,288	11,202,207	13.93	24,501,852	27,235,722
1944	27,324,173	17,771,346	.65	998,802	13,237,435	13.25	28,322,975	31,008,781

^{1/} Preliminary.

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

* * * * *

MARINE PEARL-SHELL BUTTONS: United States production of marine pearl-shell buttons in 1953 amounted to 4,612,153 gross, valued at \$7,403,894 to the man-

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

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

^{1/}Produced principally from imported shells. Preliminary.

ufacturers (table 1). This was an increase of 3 percent in quantity and 7 percent in value as compared with 1952. Manufacturers received an average of \$1.60 per

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

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

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

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

¹/Preliminary.

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

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



Feeding fish meal to poultry.

Table 1 - U. S. Production of Oyster-Shell Products by States, 1953¹

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

¹/Preliminary.

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

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

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

^{1/}The entire production was from oyster shells.



U. S. Foreign Trade

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

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

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

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

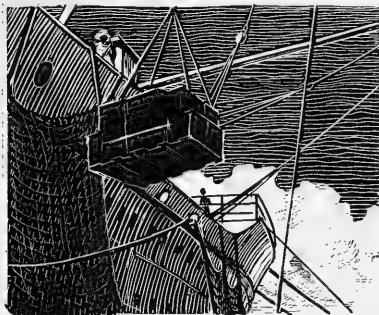
Source: United States Foreign Trade (Trade by Commodity), Summary Report FT 930, June 1954, U. S. Department of Commerce.

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

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

Imports of fresh and frozen tuna totaled 63.3 million pounds for the first half of 1954--20.5 million pounds more than a year ago. Tuna-canned-in-brine imports of 16.9 million pounds were up 5.7 million pounds.



But imports of tuna canned in oil for January-June 1954 of less than 1 million pounds were 2.4 million pounds below those for the first half of last year. On the other hand, bonito-canned-in-oil imports amounted to 9.9 million pounds, a gain of almost 3 million pounds over January-June 1953.

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

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

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

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

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



Virginia

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

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

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



Wholesale Prices, August 1954

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

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



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

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

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1947-49=100)			
			Aug. 1954	July 1954	Aug. 1954	July 1954	June 1954	Aug. 1953
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					111.1	103.5	97.4	107.8
Fresh & Frozen Fishery Products:					120.1	2/109.8	98.8	115.9
Drawn, Dressed, or Whole Finfish:					134.3	2/119.3	98.1	121.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.16	.12	161.0	119.0	59.8	144.0
Halibut, West., 20/30 lbs., drsd., fresh or froz.	New York	lb.	.32	.34	99.0	106.0	100.6	94.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.58	.57	130.4	128.4	140.5	112.1
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.43	131.4	105.4	105.4	116.5
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.65	2/.59	131.4	2/119.3	91.0	111.2
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.53	.51	107.6	104.5	99.4	117.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.49	.61	114.9	143.0	89.1	132.5
Processed, Fresh (Fish & Shellfish):					107.1	98.7	100.7	113.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.34	.22	114.0	74.8	74.8	117.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.55	.59	85.9	93.3	94.8	109.1
Oysters, shucked, standards	Norfolk	gal.	5.25	4.50	129.9	111.3	114.4	117.5
Processed, Frozen (Fish & Shellfish):					93.9	97.6	97.6	100.8
Fillets: Flounder (yellowtail), skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	100.8	100.8	108.7
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.31	.32	95.7	100.4	100.4	89.3
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.29	111.8	116.8	116.8	95.1
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.52	.55	80.2	84.1	84.1	106.5
Canned Fishery Products:					97.7	94.2	95.4	95.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	case	19.70	18.70	104.4	99.1	99.1	100.4
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	case	13.25	13.05	95.5	94.1	95.5	92.4
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	case	6.70	6.50	71.3	69.2	74.0	76.6

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

^{2/}Revised.

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

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

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



RESTAURANT OPERATORS ADVISED ON FISH SUPPLIES

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

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



International

BRITISH MAY OPERATE JAPANESE VESSELS IN WEST PACIFIC

A plan is being studied by British and Japanese interests whereby a British concessionaire may operate Japanese fishing vessels in the Western Pacific, a recent dispatch from the U. S. Embassy in London states. The London Daily Telegraph reported as follows on the plan:

"Business interests in London and Tokyo are studying a Soviet proposal that a British concessionaire, operating Japanese vessels under a British house flag, should take over the operation of the valuable West Pacific fishing grounds.

"The Kurile, Kamchatka, Okhotsk, and Bering Sea salmon and crab fishing grounds were lost by Japan at the end of the war. Official Japanese requests for the restoration of fishing rights in these areas are understood to have been rejected on the grounds that Russia is still at war with Japan.

"The new suggestion was made by Mr. Dominitsky, Russian unofficial trade representative in Tokyo. The proposal points the way to a compromise very much to the taste of trade-hungry Japan, even if fear of American opposition has prevented any official sanctioning of the project.

"Discussions on the Russian proposals are likely to be taken up in Moscow by Mr. Kazutomi Fukunaga, formerly chairman of the Fisheries Committee of the Lower House of the Diet, who is now in Stockholm on his way to the Soviet capital. It is understood that a representative of the British group is awaiting an answer to his visa application in London before flying to join in the talks."

USE OF FISH OILS IN EUROPE

In Norway polymerized fish oil is now being used only for edible purposes. The processing is carried only far enough to stabilize the fish oil and prevent it from reverting to the original fish flavor. For industrial or technical use, as practiced elsewhere, fish oils are polymerized to a much more modified state, according to information relayed by the Foreign Agricultural Service of the U. S. Department of Agriculture.

About 85 percent of the fish oil used in Europe is for edible purposes. The residue from refining of this fish oil amounts to about 10 percent of the total and is used either as soap stock in various low grades of soap or is distilled and used as fatty acids for various industrial purposes. The balance of 5 percent is used as a drying oil principally in paints, varnishes, printing inks, etc. Considerable research is under way on new uses for fish oils, but the unfavorable price relationship with competing fats has retarded commercial applications.

Some grades of fish oils from foreign sources are criticized by European users as being "loaded" with added fish-oil stearines. They would prefer the whole oils as rendered from the fish since the stearine portions do not "keep" as well after hardening by hydrogenation as does a "whole" oil.

NORTH PACIFIC FISHERIES COMMISSION

U. S. CONGRESS GIVES EFFECT TO CONVENTION: The President on August 12, 1954, signed S. 3713 (P. L. 579), a bill to give effect to the International Convention for the High Seas Fisheries of the North Pacific Ocean (United States, Canada, and Japan), which came into force June 12, 1953. The new law provides additional legislative authority for the operations of the International North Pacific Fisheries Commission which was established under the terms of the Convention, an August 13 release from the U. S. Department of State points out.

The United States Section of the Commission, as appointed by the President, has the following members:

Edward W. Allen, Attorney, Seattle, Washington;

Milton E. Brooding, Director of Industry Relations, California Packing Corporation, San Francisco, California;

John L. Farley, Director, Fish and Wildlife Service, Department of the Interior; and

B. Frank Heintzleman, Governor of Alaska.

The North Pacific Fisheries Commission held its first meeting in Washington beginning February 1, 1954, at which time it completed its organization. Two permanent Standing Committees were established; the United States Section members selected are:

Committee on Biology and Research:

Edward W. Allen, Chairman;

W. F. Thompson, Director, Fisheries Research Institute, Seattle, Washington;

Lionel A. Walford, Chief, Branch of Fishery Biology, Fish and Wildlife Service, Department of the Interior.

Committee on Finance and Administration:

John L. Farley, Chairman;

Montgomery Phister, Vice President, Van Camp Sea Food Company, Terminal Island, California.

UNITED STATES SECTION ADVISORY COMMITTEE APPOINTED: In accordance with the terms of the Act, the United States Section has appointed an Advisory Committee composed of persons from the various groups participating in the fisheries covered by the Convention and from the fishery agencies of the States or Territories the representatives of which maintain a substantial fishery in the Convention Area. Members of the Advisory Committee are:

C. L. Anderson, Director, Alaska Department of Fisheries

W. C. Arnold, Managing Director, Alaska Salmon Industry, Inc., Seattle, Washington

Vernon E. Brock, Director, Division of Fish and Game, Territory of Hawaii

Harold F. Cary, General Manager, American Tunaboat Association, San Diego, California

Richard S. Croker, Chief, Marine Fisheries Branch, State of California Department of Fish and Game

Larry Fitzpatrick, boat owner, Juneau, Alaska

Miller Freeman, President, Miller Freeman Publications, Seattle, Washington

M. T. Hoy, Oregon State Fisheries Director, Fish Commission of Oregon

George Johansen, Secretary-Treasurer, Alaska Fisherman's Union, Seattle, Washington

Robert C. Kallenberg, Fisherman, Dillingham, Alaska

Donald P. Loker, Vice President, Star-Kist Foods, Inc., Terminal Island, California

Harold E. Lokken, Manager, Fishing Vessel Owners Association, Seattle, Washington

T. F. Sandoz, President, Columbia River Packers Association Inc., Astoria, Oregon

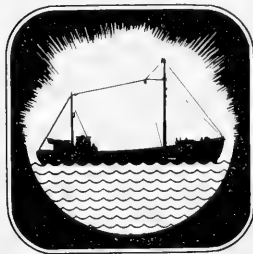
Robert J. Schoettler, Director, State of Washington, Department of Fisheries

Lowell Wakefield, President, Wakefield's Deep Sea Trawlers Inc., Seattle, Washington

James Waugh, President, Cannery Workers Union of the Pacific, Terminal Island, California.

NORTHWEST ATLANTIC FISHERIES COMMISSION

ADVISERS' GROUPS TO MEET IN DECEMBER: In accordance with decisions taken at the Northwest Atlantic Fisheries Commission Annual Meeting held in June 1954, meetings of the groups of advisers to Panels 3, 4, and 5 are called for the week of December 6, 1954. The meetings will take place at the Atlantic Biological Station, St. Andrews, N. B., Canada. It is planned to start the meetings on December 6, at which time the group of advisers to Panel 5 will meet. The meetings of the two other groups will follow in the coming days of that week. It is expected that the advisers to any special group will also attend the meetings of the other groups.



Special agendas for these meetings have not been prepared. However, the main subjects that will be dealt with will be the following: (1) Results of research in connection with the mesh regulation of haddock fishery in Subarea 5 and planning of adequate further research. (2) Assessment of the need for mesh regulations in Subarea 4. (3) Consideration of research program and of the collection of statistics in Subarea 3, with special reference to a study of optimum age of first capture of cod and haddock.

Also in accordance with decisions of the June Annual Meeting, meetings of the same groups of advisers (3, 4, and 5) are planned to take place at the Newfoundland

Research Station, St. John's, Newfoundland, during the week of March 15, 1955. The subjects to be treated at these meetings will be nearly the same as those of the St. Andrews meetings.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

1954 CATCH OF FRASER RIVER SOCKEYE SALMON: The 1954 catch of Fraser River sockeye was well beyond the 8-million-fish mark as the Adams River run started to taper off, a September 10 news release from the International Salmon Fisheries Commission points out.

In an official announcement, the Chairman of the International Pacific Salmon Fisheries Commission stated that the season's catch in Canada is expected to equal that of the United States and may well exceed the United States total. The chairman added indications were that there were sufficient fish left in the Gulf of Georgia to provide an adequate escapement of first-quality spawners but no justification could be found for relinquishing the rigid controls in effect until after 1 to 1.5 million fish passed the fishing deadline. After the required escapement passes through the fishing areas, control regulations by the Commission will end for this season.

The Chairman stated that the status of the fishery is under continuous review by the Commission and that the regulations would be altered if the facts warrant.

GREAT LAKES FISHERIES CONVENTION

UNITED STATES AND CANADA SIGN CONVENTION: A convention on Great Lakes fisheries was signed in Washington, D. C., on September 10 by representatives of the United States and Canada. Negotiations between the two Governments commenced on September 8.

The Convention provides for joint action by the United States and Canada in the field of fishery research and elimination of the predatory sea lamprey in the Great Lakes. To carry out this task, both Governments agree to establish a Great Lakes Fishery Commission of three appointees from each country.

The duties of the Commission include the formulation of research programs for the Great Lakes fisheries and the formulation and implementation of comprehensive programs for the destruction of the predatory sea lamprey. The sea lamprey has been playing havoc with some fisheries, especially whitefish and lake trout. The Commission may recommend to the Governments, on the basis of research findings, measures to make possible the maximum sustained yield of Great Lake fisheries. The Commission will have, however, no regulatory powers.

In the performance of its functions the Commission will, wherever feasible, make use of the existing state, provincial, and federal agencies in each country.

The Convention, with an initial duration of ten years, will become effective upon ratification by both countries.

The Acting Secretary of State, Walter Bedell Smith, and the Special Assistant for Fisheries to the Under Secretary of State, William C. Herrington, signed on behalf of the United States. The Canadian Ambassador in Washington, Arnold Heeney, and the Canadian Deputy Minister of Fisheries, Stewart Bates, signed on behalf of Canada. The United States delegates to the negotiations were:

Department of State: Wm. C. Herrington, Chairman; Warren F. Looney, Advisor; Sylvia E. Nilsen, Advisor.

Department of the Interior: Arnie J. Suomela, Assistant Director, Fish and Wildlife Service, Vice Chairman; William M. Terry, Foreign Affairs Specialist, Fish and Wildlife Service, Advisor; Dr. James W. Moffett, Director, Great Lakes Fishery Investigations, Advisor.

Non-Government: Dr. Charles A. Dambach, Chief, Ohio Division of Wildlife, Columbus, Ohio, Advisor; Mr. Claude Ver Duin, Mayor of Grand Haven, Michigan, Advisor.

FOOD AND AGRICULTURE ORGANIZATION

FISH FLOUR ACCEPTABILITY TO BE TESTED IN LATIN AMERICA: Large-scale tests of the acceptability of flavorless fish flour as a protein supplement in child feeding will be conducted in four Latin American countries in the near future, the Executive Director of the United Nations Children's Fund (UNICEF) reported on August 30.

The tests, which will involve more than 400 persons in each country, will be conducted in Chile, Ecuador, Mexico, and Peru with the aid of UNICEF and the Food and Agriculture Organization. The experiment in Chile will be an extension of trials already undertaken with other types of fish flour and different food combinations.



If the tests show that fish flour is acceptable as a food supplement in these countries, the UNICEF administration may recommend an allocation of funds to establish a fish flour production plant in Latin America, which can utilize the area's abundant fish resources. At present very little fish flour is produced commercially for human consumption.

In most countries, the note observes, there is a preference for flavorless fish flour which can be included in certain dishes or foods without altering their flavor. However, in some countries, chiefly in Africa and Southeast Asia, fish flour with a flavor known and liked may be preferable.

Tests based mainly on flavored fish flour are under consideration in certain parts of Africa. No plans for large-scale acceptability tests have been developed yet for countries in the Eastern Mediterranean area and Asia.

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SECOND LATIN-AMERICAN FISHERIES TRAINING CENTER: At the invitation of the Mexican Government, the Second Latin-American Fisheries Training Center was scheduled to be held in Mexico City from October 4-December 10, the Food and Agriculture Organization (FAO) announced recently.

The objectives are to give fishery administrators, technologists, biologists, and economists working in the region a general preparation and introduction to fishery science in all its fields, with special reference to the problems specific to the area. It is believed that the training offered in appraisal of resources, economic and research planning, and in technology will be useful to fishery officers who are concerned with development policy and planning, in accelerating the development of the fishery resources in their own countries, and in increasing the consumption of fish throughout the region.

This Second Center is intended to serve as a geographic complement to the first one held in Valparaiso, Chile, in 1952, by covering the area not so fully served by the Valparaiso Center, i. e. the northern Latin-American region and Caribbean area.

TRADE AGREEMENTS

JAPANESE-MEXICAN BARTER AGREEMENT INCLUDES FISHING VESSELS:

It was reported that a barter deal involving 150 Japanese-built fishing vessels in exchange for US\$5 million worth of sugar industry byproducts has been completed by two Mexican banks. The vessels will be sold to "legitimate" Mexican fishermen rather than fleet owners and payments will be made out of profits from the catches, a July 30 U. S. Embassy dispatch from Mexico City points out.

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VENEZUELAN-NICARAGUAN AGREEMENT INCLUDES CANNED SARDINES:

Negotiations have been started whereby Venezuelan corn and canned sardines will be used as partial payment for the purchase of Nicaraguan rice, the Managing Director of the Banco Agrícola y Pecuario announced. The bank director had returned from a visit to Nicaragua to dispose of some of Venezuela's surplus corn and canned fish, reports an August 2 U. S. Embassy dispatch from Caracas.



Argentina

FISH OIL PRODUCTION, 1953: Argentine fish oil production in 1953 is unofficially estimated at about 1,000 metric tons, compared with 800 tons in 1953 and 1,100 tons in 1951. This product is consumed almost entirely by the local soap industry, an April 28 U. S. Embassy dispatch from Buenos Aires reports.



Australia

EXPLORATORY TUNA FISHING: The tuna fishing resources off the Queensland eastern coast of Australia are being explored by two Australian tuna vessels under the direction of the Commonwealth Director of Fisheries. The operations are expected to last two months, and Queensland fishermen are to be given an opportunity to gain experience in tuna fishing. The tests are taking place at the request of Queensland commercial fishing interests and the Australian Professional Fishermen's Federation, reports the August 6 issue of The Fishing News, a British fishery periodical.



Canada

LARGE-MESH OTTER TRAWLS TESTED IN NORTH ATLANTIC HADDOCK FISHERY: On the Canadian Atlantic Coast otter trawlers catch large quantities of small unmarketable fish, particularly haddock, and run them out through the scuppers dead. This interferes with fishing operations by creating unnecessary work on deck, and the destruction of small, fast-growing fish reduces future landings. It is accordingly of immediate concern to fishermen and of long-term concern to the fishing industry to reduce catches of baby scrod, reports the June 1954 Trade News, a Canadian Government publication.

For more than 50 years fisheries scientists have studied this problem by testing methods of releasing small fish from otter trawls. The methods tested have in-

cluded square meshes, "windows" of large meshes, supports in the cod end, specially designed cod ends, and large meshes in various parts of the trawl. It has been clearly shown that use of large-mesh trawls is the best way to let small fish go and still keep the large marketable fish.

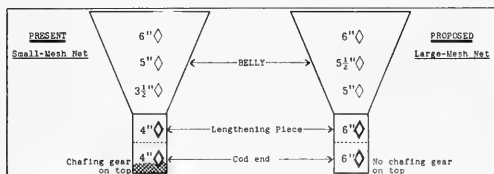


Fig. 1 - Present and proposed otter trawl nets in the Northwest Atlantic haddock fishery.

fish escape through the wide open meshes while the net is fishing on the bottom. Studies of escapement through various parts of the trawl have shown that most fish are released through the top half of the cod end.

Canadian mesh trials have shown that small fish escape even when the catches are large. Three experimental trips on the otter trawlers Cape North and Cape LeHave during 1953 tested cod ends and lengthening pieces of different mesh sizes, from 6 to 7 inches between knot centers as purchased. Even when small fish were very numerous, as on St. Pierre Bank, large numbers of baby scrod escaped. The largest meshes used released many fish below scrod size, a few scrod, and negligible numbers of large haddock. The sizes of cod released were comparable with those of haddock. Chafing gear was not used over the top half of the cod end and the cod ends did not show serious signs of wear.

Results of Haddock Catch on Average Trip of 50,000 Pounds (20,000 Fish) During May to December, 1953					
Size of Fish	Quantity of Haddock Caught				Remarks
	Present 4" Mesh		New 6" Mesh		
	No. of Fish	Lbs.	No. of Fish	Lbs.	
Baby haddock (discarded)	20,000	-	8,000	-	Many baby scrod saved
Scrod haddock	12,000	25,000	12,000	25,000	Similar scrod catches
Large haddock	8,000	25,000	9,000	30,000	More large fish
Total	40,000	50,000	29,000	55,000	Higher landings

A careful study of the Georges Bank haddock fishery since 1931 has shown that the use of large-mesh cod ends in otter trawls may be expected to increase annual landings. The International Commission for the Northwest Atlantic Fisheries accordingly recommended that governments prohibit the taking of haddock from the Georges Bank area with a trawl net which has a mesh size of less than 4½ inches (as measured with a flat gauge inserted into the mesh when the trawl is used and wet). On the basis of this action, United States trawlers are now required by regulation to use large meshes throughout the trawl with belly meshes not less than five inches single twine and with lengthening piece and cod-end meshes of about six inches double twine.

The new Georges Bank mesh regulation states that no device may be used to obstruct or diminish the mesh size, except on the underside of the cod end. The use of such chafing gear cuts down the selective action of the open meshes and reduces the efficiency of the net. Although United States trawlers have not used chafing gear on the top half of the cod end for many years, Canadian trawlers continue to do so

in order to protect the bag as it is hauled in over the side of the vessel. This chafing gear should not be used on the top half of the cod end if the industry is to take full advantage of the use of large meshes to release small fish.

In several fisheries it has been demonstrated that large meshes catch more marketable fish than small meshes. This is probably the result of elimination of small, unmarketable trash with increased flow of water and speed of gear. During the first 6 months of the Georges Bank mesh regulation, New England trawlers increased their landings by about 10 percent. This improvement, based on a comparison with a group of trawlers licensed to use the old small-mesh nets, is calculated to be worth US\$1 million per year to New England trawler fishermen.

The $1\frac{1}{2}$ Icelandic trawl commonly used by Canadian trawlers has a belly of single twine which decreases from about 6-inch mesh where it joins the square to 3 or $3\frac{1}{2}$ inches at the lengthening piece. The lengthening piece and cod-end meshes are about 4 inches double twine. It is proposed that the belly meshes should not decrease to less than 5 inches single twine and the lengthening piece and cod-end meshes should have 6-inch mesh, double twine manilla, as purchased (fig. 1). The best mesh size is believed to be still larger, but adoption of 6-inch mesh is a step in the right direction which would put Canadian meshes in line with those used by other countries fishing on the same fishing grounds. It is a safe step in that nothing will be lost and there is much to gain.

By using a 6-inch cod end baby scrod will be saved to be caught later; work on deck will be reduced; nets will be less costly to make and repair; and more marketable fish in catches will increase landings and earnings. The table above, based on results of actual use of large-mesh nets by New England trawlers during 1953, compares a typical catch by a standard 4-inch mesh net with that of a 6-inch mesh cod end without chafing gear on top.

This information has been released as a circular letter to the Canadian otter-trawling industry from the Atlantic Biological Station of the Fisheries Research Board of Canada, St. Andrews, N. B. Copies of the circular are available from the Station upon request.

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FISHERMEN SEEK TO AMEND TERRITORIAL LIMITS: The number of foreign fishing vessels operating in the Atlantic just outside the Canadian three-mile territorial limit is increasing, the annual meeting of the Fisheries Council of Canada was told. A resolution was passed asking the Federal Government to amend the present laws to permit Canadian fishing trawlers to fish within three miles of the coastline, reports the July 30 issue of The Fishing News, a British fishery magazine.

Canadian trawlers are prohibited from fishing within 12 miles of the coastline under a Federal law passed more than 20 years ago. At that time inshore fishermen complained that the trawler's nets destroyed their gear and took too many fish. Smaller trawlers, called draggers, are now permitted to the three-mile limit, but medium-sized draggers and otter trawlers have to stay outside the 12-mile limit.

The Canadian fishing industry wants the 12-mile limit observed by all countries but there are no signs yet of international agreement on the matter.

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HERRING FISHERY DEVELOPMENT IN GULF OF ST. LAWRENCE PLANNED: An agreement with a newly-formed foreign-backed company has been signed by the Nova Scotia Department of Trade and Industry, "opening the way for the development of a new million dollar fishing industry in the Province," according to an Au-

Department of Fisheries provided the reports and results of the latest Fisheries Research Board work and agreed to license the drifter trawler. The Department of Transport and the Maritime Commission agreed to permit the import of four vessels of a special type suitable for this fishery. The Provincial Department of Trade and Industry provided the coordinating effort to have all interests work together and the inducement of an industrial loan to round out the capital requirements. The sources for the balance of the capital cost, and all of the working capital, are British and American.

The Fisheries Research Board will continue their work by having observers on the vessels operated by the newly-formed company to collect and record additional data concerning area and volume of catch and any other information that will further the investigation and study of this resource. The boats and experimental fishing work of the Fisheries Research Board will be used in other places off the Nova Scotia coast to attempt to determine further areas where herring may be taken in commercial quantities for an extended season.

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FISH STICKS INTRODUCED ON WEST COAST: Fish sticks are being introduced on Canada's west coast by a British Columbia firm and the product is to be marketed in the near future in Vancouver, according to the July Trade News of the Canadian Department of Fisheries. Frozen fish blocks are cut by bandsaw into small pieces $\frac{1}{2} \times \frac{3}{4} \times 3\frac{3}{4}$ inches. These pieces of fish, still frozen, are then dipped into a prepared batter, doused in a meal preparation, placed on wire trays, immersed in a deep-well cooker, and cooked for approximately $1\frac{1}{2}$ minutes. After packaging, the cooked fish sticks are stacked on trays, frozen, and then placed in cold storage.

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IMPROVED FISH INSPECTION PLANNED: More effective fish inspection through cooperation between Canadian Federal and provincial governments was discussed at a meeting in Ottawa late in June. The Deputy Minister of Fisheries described the meeting as "a significant step forward," according to the July 1954 Trade News, a Canadian Department of Fisheries publication.

The Director of the Inspection and Consumer Service of the Federal Department of Fisheries outlined to representatives of the 10 provinces the Department's proposals for the quality control of fresh and frozen fish, construction, equipment, sanitation, and operation of plants producing these products.

In cooperation with the fishing industry, the Department early this year completed a coast-to-coast survey of more than 500 plants which handle fresh, frozen, salted, and pickled fish for interprovincial or international trade. As a result of this survey the Department held discussions in March to draft minimum standards so that it will be possible to maintain peak quality from the time fish are caught until they reach the consumer. The June meeting was called so that the fullest consultation could be held with the provinces on the proposals set forth by the Department.

The provincial representatives signified the interest of their respective provinces in such measures. They will report to their governments and subsequent discussions will be held regarding the possibility of introducing provincial legislation which would complement similar regulations proposed by the Federal Department of Fisheries.

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BRITISH COLUMBIA FISHERMEN NEED FISHING LICENSES: Members of the crews on British Columbia halibut long liners and on fishing trawlers are now required to have a fishing license, according to the July Trade News, a Canadian Department of Fisheries publication. An amendment to British Columbia's special fishery regulations states that all persons engaged on a boat used in halibut, black cod, or tuna fishing are required to obtain a license. Fishermen shipping as crewmen on trawlers also come under this category. Licenses will cost C\$1.

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MAGDALEN ISLANDS' FISHERIES REVIEW, 1953: The economy of the Magdalen Islands, Quebec, is based on fishery products, with lobster as the most valuable, states a July 30 U. S. consular dispatch from Quebec.

Fishery products production in 1953 amounted to C\$1,821,777 and the lobster catch represented C\$887,183 or nearly 50 percent of the total value. Following in order of value were herring C\$432,853, cod C\$219,589, and mackerel C\$192,240. Usually the cod catch brings the least returns to the Islands, but in 1953 the mackerel catch was poor.

Prices paid to the fishermen in 1953 were: lobster 25 to 35 Canadian cents per pound; herring 70 cents per case; mackerel 5 cents and cod 2 cents per pound. The lobster fishermen are the most prosperous--although limited by law to 300 traps, one fishermen earned nearly C\$10,000 in 1953 which represented a catch of about 40,000 pounds of lobsters.

There are 1,269 Magdalen Islands fishermen--686 fish for cod, 477 for herring, 630 for lobster, and 810 fish for mackerel. Most men fish for 2 or 3 species during the season. There is a drier for cod belonging to the Provincial Government which has a capacity of 2 million pounds annually. There are 5 refrigeration plants having a capacity for 950,000 pounds. There are 9 smokehouses for herring--3 belonging to cooperatives and 6 privately owned. Their capacity exceeds 100,000 cases.



Iceland

NORDIC COUNCIL REPORTS ON ICELAND'S TERRITORIAL WATERS REGULATIONS: Qualified support was given to Iceland by the Nordic Council in the international dispute resulting from Icelandic territorial waters regulations, a U. S. Embassy dispatch (August 20) from Oslo states. In a carefully phrased resolution the Council recognized that it is a matter of interest to all countries engaged in fishing off the Icelandic coast that fish conservation measures be enforced. Since the legality of the measures adopted by Iceland is a matter of international dispute, the Council concluded that the subject should be referred to the International Court at The Hague and should not be discussed in either the Nordic Council or the Council for Europe.

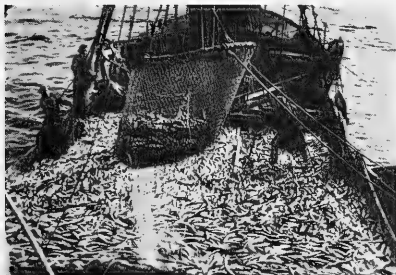
The Icelandic proposal to the Nordic Council for support on the fisheries boundary dispute was referred to the Economic Committee of the Council for consideration. After limited discussion, the Swedish members of the Committee drew up a draft resolution. Only minor changes were made by the committee as a whole prior to reporting out the draft. At the plenary session on August 17 the committee's recommendations were unanimously approved by the Council. The text of the resolution follows:

"The Nordic Council recognizes that it is of interest to all countries engaged in fishing outside the Icelandic coast and of vital interest to Iceland that precautions be taken to protect the fish population in these waters.

"To the extent the legality of precautions already adopted is the object of dispute between Iceland and another country the Nordic Council is not qualified to make any statement. The right forum for an international law interpretation of the dispute is The Hague Court, not the Nordic Council or Council for Europe."

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HERRING PRODUCTION, 1954: The total catch of the Icelandic herring fisheries off the north coast during the 1954 summer season was 51,000 barrels of salted herring, about one-fourth of the quantity sold under the various trade agreements concluded this spring. This is the ninth summer in succession that Iceland has had a poor herring catch, the August 27 issue of the International Financial News Survey reports.



Icelandic Fishing Vessel Brailing Herring

The Norwegian fishermen, who were also taking part in the herring fisheries off the Icelandic coast, are reported to have made a total catch of nearly 200,000 barrels, which is about the same as last year. Since sales by Norwegian exporters before the season started were equal to the catch, there will be little for Norwegian domestic consumption.



India

NORWAY SUPPLIES FISHING BOATS: Three specially designed fishing boats, built near the west Norway port of Bergen, were scheduled to sail for India in September, the Norwegian Information Service announced on September 9. Equipped with 5-hp. auxiliary motors, the 22-foot flat-bottomed open craft have been contracted by the 24-million-kroner (US\$3.4 million) Norwegian India Aid Fund. The vessels will be manned by Norwegian fishermen who have volunteered to instruct Indian fishermen in modern techniques. In cooperation with Indian authorities, the Fund is aiding the development of a community comprising some 12,000 fishermen in Travancore-Cochin.

The Norwegian organization recently built an up-to-date boatyard in Travancore-Cochin. Here the first of a series of motorized fishing vessels, adapted to local conditions, is well under way. An adjoining mechanical workshop will take care of maintenance and repairs. It will also serve as training school for apprentice mechanics.

Working under supervision of Norwegian specialists, local fishermen have for the past year been experimenting with various types of fishing gear, including the purse seine. In another experiment, the perishable nets traditionally used by the Indian fishermen are being tanned and impregnated to stand longer immersion. In both cases, the objective is to increase the catch.

The Travancore-Cochin project plans also call for introduction of better fishing methods; building breakwaters and ice plants; furnishing insulated vans and motorcraft for fish transportation; aiding the development of fishermen's cooperatives; supplying safe drinking water; and establishment of a maternity and health center. A major part of the work is far advanced.

Note: See Commercial Fisheries Review, March 1954, p. 45; February 1954, p. 42.



Iran

CAVIAR EXPORTS, 1953: Iranian caviar exports amounted to 102.7 metric tons for the first 11 months of the Iranian year beginning March 21, 1953, according to preliminary figures. During the first 8 months only 28.3 tons were exported; therefore, the greatest quantity (74.4 tons) was exported during the three-months' period November 21, 1953-February 19, 1954.

The U. S. S. R. received 81 tons, or 78.9 percent of the total exports. France who is the next largest buyer received only 17 tons, or 17 percent. Except for shipments to Germany (2 tons) and the United States (1 ton), those to other countries were mostly of a token nature. Russia took delivery by boat at Bandar Pahlavi on the Caspian Sea, an April 16 U. S. Embassy dispatch from Tehran states. Shipments to all other countries were effected by air.

Since the exportation of Iranian caviar has been a Russian monopoly for some thirty years, it will be necessary for Iran to develop its own markets and outlets. During the first year under Iranian control, little has been done in that respect. The Iranian National Fisheries last year simply offered various lots of caviar at auction. These were purchased by local merchant-exporters, who in turn, sold the caviar to foreign buyers. There have been reports that some of the European buyers were dissatisfied with the quality and packaging of the Iranian product. Obviously, these shortcomings will have to be remedied and a distribution system developed before Iran can expect to market its caviar abroad in any sizable quantities.

Caviar production is probably not much greater than the exports because domestic consumption is very limited. The price of caviar on the Tehran market before the fisheries reverted to Iranian control was around 450 rials per kilogram (US\$26 per pound); the price has since been raised to around 1600 rials per kilogram (US\$81 per pound).

CASPIAN FISHERIES: Recent newspaper reports stated that the Iranian indebtedness to the U. S. S. R. had been liquidated. This indebtedness resulted from the return to Iran of the Caspian Fisheries at the expiration of the Russian concession on January 31, 1953. Latest estimates are that Iran may still owe Russia the equivalent of some US\$45,000-46,000 on that account.

The Caspian fisheries reverted to Iran when the concession granted some 30 years ago to the U. S. S. R. was allowed to expire on January 31, 1953. Iran then acquired, under the terms of the concession agreement, the Russian interest therein (50 percent). The value of the Russian share in the fisheries was to be paid in fishery products, including caviar.

Certain areas in the Caspian Sea are reserved for fishing only by the Iranian National Fisheries Company. Other areas are unrestricted and independent fishermen are free to fish there. In consequence, the Tehran market is supplied by the two competing sources of supply. The Government installation at Pahlavi has freezing facilities and is, therefore, able to supply the Tehran and other markets so long as frozen fish do not spoil under truck transport conditions. The market for the in-

dependent fishermen, who deal only in fresh fish, is limited to the winter months and since the highways over the Elborz Mountains between the Caspian and Tehran are oftentimes blocked with snow, deliveries are difficult and uncertain. Some of the private fishing activities on the Eastern Caspian are not too far removed from the railroad but this means of transportation cannot be depended upon as there are few railway refrigerator cars. All domestic and foreign shipments out of Pahlavi, the principal fishing center, except to the U. S. S. R., must be made by truck and there are no refrigerator trucks. Hence fish transport up to the present is confined to the winter months. The two American concerns which made the experimental shipments of sturgeon to New York last winter and which are interested in developing the caviar business as well, foresaw the necessity of supplying refrigerator trucks to make the long haul to the seaport of Khorramshahr, if the business were ever to be developed, and are planning to do so.

The third report of the National Fisheries Company covering the period August 21, 1953 to November 21, 1953, and published on December 6, 1953, gives the following prices for various fisheries products:

	Smoked	Salted	Frozen	Fresh
 (U. S. dollars per metric ton)			
1. Non-scale fish				
Sturgeon	1,076.50	-	336.45	-
2. Scale fish				
Bream	329.40	-	259.30	-
Sea pike	-	-	130.60	-
Chub	414.80	-	214.40	-
Carp	-	84.30	160.30	-
Herring	505.30	264.40	-	-
Salmon	-	1,644.00	919.00	966.20

The Iranian National Fisheries Company has set the following prices (net weight) for these various grades of caviar, according to quantities, as follows:

	Up to 100 kilos	Up to 500 kilos	Up to 999 kilos	1,000 kilos and over
 (U. S. dollars per kilo)			
Grain caviar, Osietre and Blouga, extra, Grade I	20.50	19.00	18.50	18.00 plus 25 Rials
Grain caviar, Osietre and Blouga, Grade II	10.30	9.60	9.30	9.00 plus 25 Rials
Grain caviar Sevroga, Grade I	14.30	13.30	13.00	12.60 plus 25 Rials
Grain caviar Sevroga, Grade II	7.20	6.70	6.60	6.30 plus 25 Rials
Other varieties of caviar:				
Pressed Sevroga, Grade I	7.21	-	-	-
Pressed Sevroga, Grade II	5.40	-	-	-
Tamise (Balech)	1.40	-	-	-



Japan

1954 CATCH OF NORTH PACIFIC SALMON FLEETS: The seven Japanese North Pacific offshore salmon and salmon-trout fleets closed their season recently, reports an August 20 American Embassy dispatch from Tokyo. The total catch

this season was 17,611,088 fish as compared to 7,700,176 fish for the 1953 season when only three fleets operated. The fleets this year consisted of 160 catchers and 34 survey vessels.

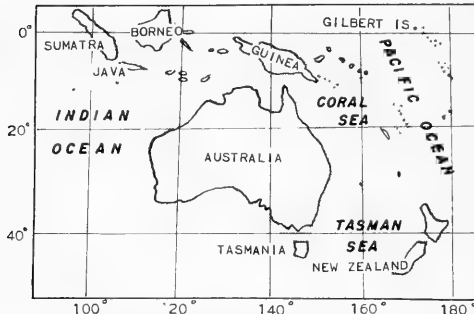
No information is available as to the respective quantities which were canned, salted, and frozen.

In addition, the coastal fleets based at Nemuro and operating in the waters east of the Kuriles closed their season on August 5 and reported a catch of 25,420,000 pounds of fish as compared to 20,920,000 pounds in 1953.

1954 Catch of North Pacific Salmon Fleets by Species	
Species	Number of Fish
Sockeye	3,542,301
Chum	8,780,355
Pink	4,590,651
Other	697,781
Total	17,611,088

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LARGE TUNA CATCHES IN TASMAN SEA OFF AUSTRALIA: Japanese tuna-liners, fishing off Australia's eastern coast, have been getting large catches, including albacore, taken in the Tasman Sea midway between Australia and New Zealand. This was told by a visiting executive of a United States canning company.



The visitor identified from photographs the Japanese vessels recently sighted off northwest Australia. He said they were modern long liners capable of up to 18 knots, according to the June 1954 Fisheries Newsletter, an Australian trade magazine.

Within the past year the Japanese have extended their tuna fishing in the Pacific east to the Gilbert Islands, south to the Tasman Sea, and west around northern Australia into the Indian Ocean. Long lining is the method used mainly. The Japanese work their boats in pairs, using one to haul and the other to bait. They relay the lines about every 10 to 12 hours, and work 24 hours a day.

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BRISTOL BAY CRAB MEAT PRODUCTION, 1954: The Japanese crab fishing expedition to Bristol Bay terminated activities on July 10 and total production amounted to 59,850 cases of crab meat from a catch of 1,060,109 crabs, a July 30 U. S. Embassy dispatch from Tokyo reports. In 1953 the expedition caught 1,276,360 crabs and produced 58,240 cases of crab meat. The 1953 expedition did not reach its production goal until August 15.

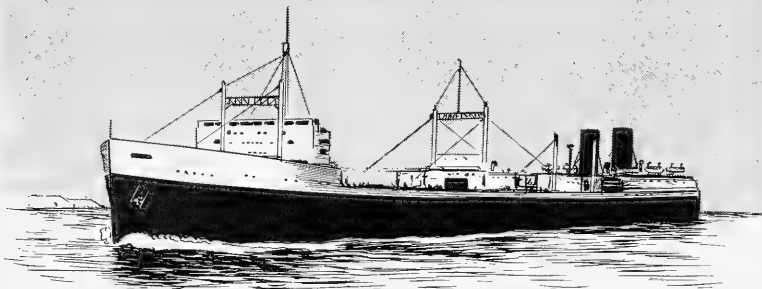
In numbers of crabs the 1954 catch was down 17 percent, but the production of canned crab meat was up 3 percent, indicating that larger crabs were caught in 1954.

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FISH AND WHALE OIL PRODUCTION OUTLOOK: The Japanese production of fish oil for the 1954 fiscal year ending next March 31 will amount to about 19,800 metric tons, compared with a production of about 17,000 tons in the fiscal year 1953

and 19,829 tons in 1952, according to preliminary estimates of the Japanese Ministry of International Trade and Industry.

The production of whale oil is also expected to increase in fiscal year 1954. Current estimates are for a production of 58,000 tons of fin and sperm oils, compared with a production of 53,238 tons for the fiscal year 1953 and 42,900 tons for 1952.



Japanese Antarctic Whaling Mothership

It is anticipated by the Japanese Government that about one-half of the 1954 fiscal year's production of fish oil and about 24,300 metric tons of the whale oil will be exported. Europe was the principal export market for these oils last year, according to a recent Bulletin from the U. S. Department of Agriculture.



Mexico

SHRIMP EXPORT DUTY CUT: The Mexican export duty on frozen shrimp (Mexican tariff classification 11-15) was cut to 0.30 peso for 100 net kilograms and 5 percent ad valorem by a decree effective August 2. The former duty was 0.30 peso per 100 net kilograms and 10 percent ad valorem.



Norway

HERRING MEAL AND OIL PRODUCTION, 1954: Approximately 200,000 metric tons of herring meal and 90,000 tons of herring oil were produced in Norway during the 1954 season (January 1 to May 1), according to a spokesman for the Norwegian herring industry. This entire production was reported to have been sold for domestic consumption, exported, or reserved for export by the middle of May. The total value of 1954 herring meal and oil is estimated at 350 million kroner (US\$49 million), of which 240 million kroner (US\$34 million) is represented by foreign exchange from exports.

About 30 percent of the herring meal produced in Norway is sold for domestic use, and the rest is exported. Small quantities of raw herring oil are exported directly. Most of the herring oil is refined in Norway; small quantities are then used in the canning of sardines and the manufacture of fats, but most of the refined oil is exported.

Between January 1 and June 12, according to the Norwegian Central Bureau of Statistics, 103,969 metric tons of herring meal were exported, about 30 percent to the United States. During the same period, 5,323 tons of raw herring oil were exported, a U. S. Embassy dispatch (July 16) reports.

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FIRM BUYS FISH-MEAL FACTORYSHIP FROM ICELAND: A Norwegian concern has purchased Iceland's only floating herring factoryship for £100,000 (US\$280,000), according to the International Financial News Survey, August 20. This factoryship, which processes herring into oil and meal, can move to the waters where herring are caught, thus minimizing transportation costs. Norway is operating several floating herring factories.

The floating herring factoryship was bought by Iceland in 1947 and financed partly by U. S. aid under the ECA program. It was intended to process the winter herring catch in the south of Iceland. However, owing to the failure of the herring catch, the plant has been in operation during only one season--1950. Since then the ship has been idle.

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LARGE TUNA CATCHES: The tuna fishing season in Norway was off to a good start, the Norwegian Information Service reports in an August 12 bulletin. The season normally lasts until the end of October. The fisheries began a week earlier than usual, and the first fortnight some 3,000 metric tons were landed, compared with 6,700 for the entire 1953 season. Averaging 360 pounds each, the tuna are especially plentiful on the banks off Helgeland in North Norway. Catches off the western district of Hordaland, however, have been rather disappointing so far. These waters usually offer good tuna fishing.

Most of the fish is shipped to Italy, where importers have contracted for 4,300 metric tons of frozen tuna. Up to July 26 a total of 74 refrigerated carloads of tuna had left Bergen bound for various destinations in Europe. Some of the fish was shipped fresh from the North Norway port of Mosjoen.

Virtually all of the tuna is caught in specially designed nets, costing between Kr. 30,000-40,000 (US\$4,200 to 5,600) each. Formerly the large fish were hooked with hand line or shot, but such methods proved to be very uneconomical and yielded much smaller catches. Using tuna nets, North Norway fishermen recently landed about 8,000 tuna weighing 1,500 to 2,000 metric tons in one day.

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SARDINES AND SALTED COD EXPORTS: Canned Brisling Sardines: A total of 17,787 metric tons of canned brisling sardines had been exported from Norway in 1954 up to July 3, compared with 11,445 tons in the corresponding period of 1953. The United States was the leading importer, a U. S. Embassy dispatch (August 13) from Oslo reports. Up to July 17, however, only 375,000 cases of brisling had been packed by Norwegian canneries, compared with 410,000 cases last year. Increased exports indicate an appreciable reduction in stocks from the 1953 brisling fishing season, the most successful on record.

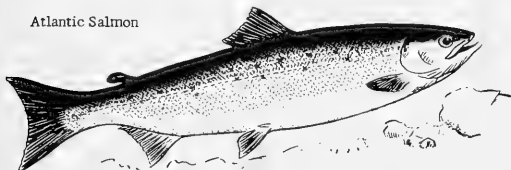
Dried Salted Cod: Norwegian exports of dried salted cod (klipfish) for the first seven months of 1954 were over 20,000 metric tons. This is only 2,500 tons more than the poor export total for the corresponding period of last year. The total 1954 exports of dried salted cod are not expected to exceed 37,000 tons, or about 18,000 tons below normal, and little more than half the 1954 National Budget estimate of 67,000 tons.

The relatively low exports of dried salted cod is the direct result of the disappointing spring Lofoten cod catch, the poorest on record. There was a bright outlook however, from the report by the Norwegian Minister to Argentina, who declared that Argentina is interested in taking more Norwegian dried salted cod under the proposed new trade agreement next year. Increased exports, however, would depend on larger catches in the future.

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SALMON LADDER: Work on a 1,575-foot salmon ladder, believed to be the longest in the world, will be started in the fall of 1954 in the Rana River, North

Atlantic Salmon



Norway, according to a bulletin (August 19) from the Norwegian Information Service. Running through a 7-foot diameter tunnel to be blasted out of solid rock, the ladder will enable the salmon to reach the 37-mile stretch of the Rana River above the 90-foot high Ranfossen waterfall. Sponsors hope that the ambitious scheme will increase the salmon stock by 75-80 metric tons.

Light and ventilation shafts in the 1,100-foot tunnel will be used as observation posts, where tourists may watch the salmon climb the ladder. The tunnel-ladder will also be equipped with a photo-electric counting device to check the upriver flow of salmon.

Total cost of the project is estimated at 316,000 kroner (US\$44,000), of which 180,000 kroner (US\$25,000) will be paid by the State. Assuming that the salmon actually will go on up to the upper reaches of the Rana River, it is estimated that the increased yield should pay off the cost in a few years.



Republic of the Philippines

DELEGATION FOR U. S. -PHILIPPINE TRADE AGREEMENT TALKS LEAVES FOR UNITED STATES: Senator Jose P. Laurel, who has been appointed by Philippine President Raymon Magsaysay to head the Philippine Delegation to consult with an American Delegation concerning revision of the Philippine-United States Trade Agreement, was expected to arrive in San Francisco on September 9 and in Washington about September 13.

Accompanying Senator Laurel will be three other members of the Philippine Delegation, Senator Gil J. Puyat, Chairman of the Senate Finance Committee, Governor M. Cuaderno, Governor of the Central Bank of the Philippines, and Congressman Diosdado Macapagal, together with members of the Delegation's technical staff, a September 8 U. S. Department of State news release points out.

The Philippine Government last year requested reexamination and readjustment of the 1946 Agreement on trade and related matters. President Eisenhower replied that the United States was ready to give sympathetic consideration to any specific proposals for revision which the Philippine Government might advance. On July 6 the White House announced the designation by Secretary of State John Foster Dulles of James M. Langley, New Hampshire publisher, as Chairman of the United States Delegation which will meet with the Philippine Delegation to consider possible modification of the Trade Agreement.

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CANNED FISH PRICE CONTROLS REINSTITUTED: Price controls for a number of commodities, including canned fish (sardines, squid, mackerel, herring, and salmon), were reinstated in the Philippines on June 18 by Republic Act No. 1168. Previous controls expired on December 31, 1953, according to the August 2 Foreign Commerce Weekly, a U. S. Department of Commerce publication.

The maximum prices of these commodities may not exceed ceilings in effect on December 31, 1953, and are to remain in effect until February 15, 1955, the terminal date of the new law.



Portugal

SARDINE INDUSTRY AIDED BY BRITISH LIFTING IMPORT RESTRICTIONS: The reopening of the British market for Portuguese sardines by the release of the British sardine import trade from government controls had the effect of cleaning out the accumulated stocks held by Portuguese canners. Notwithstanding this, the export price for sardines has been even lower than a year ago, averaging 15.80 escudos per kilo (24.8 U. S. cents per pound) against 16.00 escudos per kilo (25.1 U. S. cents per pound). The total Portuguese sardine exports in the first six months of 1954 amounted to 16,968 metric tons as compared with 12,989 metric tons during the first six months of 1953.

Sardines had been somewhat more abundant during the latter part of the last fishing season but are again scarce. There have been reports in the press of complaints by fishermen that catches have recently been limited to undersized sardines which must by law be returned to the sea even if dead. Prices for fresh fish have averaged 78.00 escudos (US\$2.72) per basket, the highest price since 1949. As a consequence, high prices for raw material, plus poor export prices, make hard sledding for sardine canners, a July 28 U. S. Embassy dispatch from Lisbon states.



Spain

OUTLOOK FOR CANNED FISH EXPORTS: The depressed Spanish fishing industry hopes to improve its position by increasing exports, but certain problems have to be faced first. A recent article in a well-known Spanish trade journal discusses these problems and possible solutions.

Spanish exports of tuna to most markets have gradually diminished. However, there are opportunities for expanding sales of the white-meat variety to the United

States market, provided Spanish prices can be brought closer in line with those of Japan and Peru, the principal foreign suppliers to the United States.

The anchovy catch is an important source of revenue for Spanish fishermen, particularly in Galicia, where the best-quality anchovies are packed for export. The United States is the only market capable of absorbing the Galician production and Galician exports of anchovies to the United States have increased from 430 metric tons in 1950 to 960 metric tons in 1952. Anchovies caught in the Cantabrian region are salted and packed in bulk in barrels or tins, and 70 to 80 percent of the production is exported. The principal market is Italy, where the fish are filleted and reexported to compete in some measure with the Galician anchovies. Portugal is Spain's keenest competitor in the anchovy export markets, even though Portuguese prices are similar or a little higher.

Sardines have been scarce along Spain's northern coasts during the past few years, and this has meant the loss of the United States market to Portuguese and French Moroccan producers. Spanish exporters are now quoting \$14 to \$15 per case of 100 tins; comparative French Moroccan and Portuguese prices are \$9.25 and \$9.10 per case, respectively. Good catches of sardines are still being brought in along Spain's southern coasts.

Unfortunately, Spanish sardine canning plants are situated along the north coasts and it is necessary to transport the sardines by truck nearly 1,000 miles. This results in Spanish cannerys paying more than twice as much for their sardines as the Portuguese cannerys and the quality deteriorates during the long trip. Before 1936 exports of sardines averaged 14,000 metric tons a year, but in recent years have averaged no more than 5,400 tons. This points up the decline in Spain's sardine canning industry, reports the August 21 Foreign Trade, a Canadian Government publication.

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VIGO FISH CANNING TRENDS, JULY 1954: Fish canneries in the Vigo area of Spain purchased 2.3 million pounds of fish, mainly albacore, in July as compared with 548,000 pounds in June and 2.0 million pounds in July 1953. The increased catch in July was due to the seasonal albacore runs along the coast. Sardines continued to be scarce.

Cannerys revealed that although the industry was active practically all during July, the future is still gloomy as the Government has not as yet taken any steps to liberalize existing export rates. The cannerys feel that with reduced production, raw material shortages, and increased labor costs, competition in foreign markets is impossible. The industry's major problem continues to be shortage of liquid capital to finance operations, an August 14 U. S. consular dispatch from Vigo points out.



Trust Territory of the Pacific Islands

REPORT ON THE FISHERIES: Some of the past year's developments in the Trust Territory of the Pacific Islands were presented by Frank E. Midkiff, High Commissioner of the Trust Territory, in the U. N. Trusteeship Council on July 7 (Midkiff was special U. S. representative to the Council). That part of the statement that pertains to fisheries follows:

During the past fiscal year (July 1, 1953-June 30, 1954) the trust territory has explored possibilities for developing

commercial fisheries in Micronesia along lines that will insure maximum participation of, and accrual of direct benefits to, the Micronesians.

Much first-rate advice was obtained through consultation with members of the Tuna Industry Advisory Committee (advisory to the Director, U. S. Fish and Wildlife Service), which met at Honolulu in February of this year. Partly as a result of such counsel, and also on the strength of advice received at frequent intervals from officials of the Pacific Oceanic Fishery Investigations (another activity of the Fish and Wildlife Service), first attention is being given to encouragement of local fisheries in the districts, for the purposes of increasing the supplies of fish protein needed for local consumption, as well as to enable exports to neighboring districts and to Guam. Efforts are being put forth further to develop the program instituted at Ponape in early 1952 whereby Kapingamarangi and Moki men residing there market the fish catches obtained off the main channel entrance. Since inception of the plan, surpluses have been shipped regularly to Truk for use there in the hospital and central dining room, with some going on to Guam.

A plan to store and raise fish in fish pens for export sale has been broached at Ponape but has been discounted as a likely commercial venture by fisheries experts. The fish pens, however, long successfully used on Moki Atoll, may have future value in connection with local subsistence fishing activities elsewhere.

The government of the trust territory is observing closely the new--and for American fishing interests, radical--experimental expeditions to the central Pacific area by the United States fishing groups. Activities and participation by Micronesians are objectives in all such planning.

Conversations are proceeding with Hawaiian and West Coast (United States) commercial firms toward the development of improved fishing facilities for the Micronesians. It

is not planned to set up canneries or byproducts plants, but it is anticipated that the islanders will be taught ways to improve their fishing intake.

The Japanese military, in order to further their security program, destroyed all but 80 of the Micronesians' 1,500 canoes. This literally wiped out the native subsistence fishing on many islands except for reef wading and fishing. Since each canoe requires a mature breadfruit tree to manufacture, and since there are no surplus breadfruit trees on most islands, it will take a considerable time to replace the canoes. The Micronesians are now occupied in remodeling and repairing surplus whaleboats and motor launches to meet the need. In a few instances, they are constructing cabin launches which use an outboard motor or engine, permitting wider cruising range.

The trochus industry yielded \$18,439 to the Micronesians in 1953. At present we are spreading the trochus beds and extending the period of the harvest season annually, thus increasing this source of income.

In another statement to the Council on July 13, the High Commissioner states: "I share the hope expressed by several members that it will be possible to open a fishing program in the Territory. Commercial fishing is as yet a relatively undeveloped activity in the Territory. The reasons for this are the lack of both the capital and the specialized knowledge required for the operation. It is my hope that we shall be able to make an arrangement which will bring in to the Territory the capital and knowledge and which will also provide training and participation by the Micronesians. We are working with the Federal Pacific Ocean Fisheries Investigation Organization on this problem."



Union of South Africa

U. S. FIRM INVESTS IN CANNED PILCHARDS AND JACK MACKEREL FISHERIES: The biggest single purchasing arrangement in the history of the South African fishing industry is embodied in a deal between a group of South African fish canners and a California fish canner.

In terms of this association the United States company is marketing under its own labels in dollar areas the canned pilchards and canned jack mackerel (maasbankers) produced by the South African group of companies.

The agreement, which has been operating since January 1, 1954, and which has already resulted in the export to the United States of nearly 200,000 cases of jack mackerel (maasbanker) produced by the group, is in process of being given legal form to make this joining of hands permanent. The agreement envisages the United States company taking a minority interest in the South African Corporation--this will be the first entry of United States capital into the South African fishing industry.

The United States company began purchasing operations in the Union in 1953, buying about 220,000 cases of canned pilchards from a number of sources. As a result, however, of a visit by the company's president and sales manager, it was decided to form the association with the group of companies.

One remarkable result of this United States interest in the South African fish canning industry is that the maasbanker, which has not hitherto been canned on any-

thing like the scale of the pilchard, is bringing in the United States a substantially higher price than the canned pilchard.

In 1953 the South African group packed only 60,000 cases of maasbanker. In the first five months of 1954 the group packed about 205,000 cases (48 1-lb. cans) of this fish--practically the whole pack was exported to the United States.

Following the successful maasbanker season of the first months of this year, the South African industry is now engaged in pilchard fishing, but no accurate indication is available of what the season will bring. The South African group, however, hopes to pack at least several hundred thousand cases of pilchards, not only to meet its United States commitments but also to maintain its sales in the sterling area, as well as in the Union itself.

The California firm looked to South Africa because it was apparent that the Union was the only country in the world with sufficient resources of pilchards and jack mackerel to sustain a substantial export trade. The decision followed the virtually complete collapse of the Californian pilchard industry, which, starting in 1914, grew so rapidly that by the 1936-37 season no less than 791,000 tons of pilchards were harvested for the canning and reduction plants. This rate of catching was apparently far too great for after that peak season the catch fell off rapidly, so much so that the 1953/54 season ended with 2,620 tons caught, 63,384 cases packed.

It is this great vacuum in the United States market which the South African industry now has the opportunity of at least partially filling. The South African Government has taken early and drastic powers to prevent overfishing.

Last year United States importers bought about 400,000 cases of canned fish from the Union and South-West Africa. This year the figure may well be trebled, with the group providing the biggest single contribution, reports the July South African Shipping News and Fishing Industry Review.

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CANNED FISH PRODUCTION AND STOCKS, 1952/53: The total production of canned fish in the Union of South Africa and South-West Africa during the period November 1, 1952, to October 31, 1953, amounted to 86.8 million pounds, according to an August 20 U. S. consular dispatch from Cape Town (see table 1). Pilchards

Species	Nov. 1, 1952 to Oct. 31, 1953	Nov. -Dec. 1953
	Quantity	Quantity
	Lbs.	Lbs.
Albacore	97,905	102,696
Maasbankers (jack mackerel).....	23,251,700	9,072
Mackerel	800,392	-
Pilchards ($\frac{1}{2}$ -lb. pack)	8,284,101	280,296
Pilchards (1-lb. pack)	54,034,002	472,032
Snoek	358,464	-
Miscellaneous	16,512	-
Total	86,843,076	864,096

(62.3 million pounds) comprised the bulk of the pack, followed by maasbankers or jack mackerel (23.3 million pounds). Canned fish production during November-December 1953 totaled .9 million pounds, mostly pilchards and maasbankers or jack mackerel.

Canned fish inventories on December 31, 1953, totaled 21.6 million pounds, almost entirely pilchards and maasbankers or jack mackerel.

Species	Nov. 1, 1953	Dec. 31, 1953
	Quantity	Quantity
	Lbs.	Lbs.
Albacore.....	25,929	102,312
Maasbankers (jack mackerel).....	8,356,062	3,613,636
Mackerel.....	56,574	1,698
Pilchards (½-lb pack).....	2,661,381	1,595,484
Pilchards (1-lb pack).....	21,198,818	16,189,872
Snoek.....	166,188	85,920
Stockfish.....	34,032	7,752
Miscellaneous.....	5,568	5,472
Total.....	32,504,552	21,602,146

Practically all of the production of pilchards and maasbankers recorded for the last two months of 1954 was during November in South-West Africa. For pilchards and maasbankers the Union of South Africa had a closed season during November-December, while in South-West Africa the closed season began on November 15. There was no closed season for albacore.

Pilchards and maasbankers are not quite so plentiful this year in the Union of South Africa and the industry is approximately 40,000 metric tons short of the maximum of 250,000 tons which may be caught. Representations have been made to the Division of Fisheries that fishing be stopped immediately and the season closed until October 31 at which time fishing would again be permitted. This has been agreed to. This year the season closed on August 13 and will reopen again on November 1 for one month during which time any amount of fish may be caught. It is felt that there will be more fish available during this month, and the industry will take the full quota. Fish are quite scarce now and little chance existed of the quota being filled before the season was to close on September 1.

It should be noted that this does not apply to South-West Africa where fishing has been good and the closed season begins on November 15.



United Kingdom

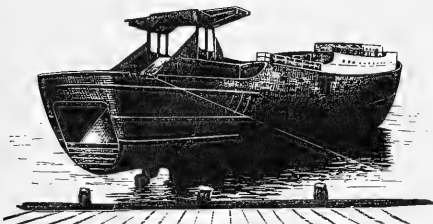
FACTORY TRAWLER "FAIRTRY" LANDS FIRST CATCH FROM GRAND BANKS: The British freezing-at-sea factory trawler Fairtry landed at Immingham on July 28 with a catch of 400-500 tons of fish, 86 tons of fish meal, and about 4,200 gallons of liver oils. The Fairtry was on her maiden voyage and fished on the Grand Banks of Newfoundland and off Greenland, the trip lasting three months. Most of the fish consisted of frozen fillets of cod and haddock, according to the July 31 Fish Trades Gazette, a British fishery magazine.

All of the fish landed from the Fairtry went into cold storage at Grimsby for eventual domestic and export trade.

One of the vessel's owners commented, "Everything has gone more or less according to plan and we are very satisfied. It will take more than one voyage before the success of the venture from the economic point of view can be ascertained."

... "For a maiden voyage she has run very well indeed and I think we have proved to our own satisfaction that we can produce a good quality quick-frozen article at sea. We had to prove that it could be done at sea. The question is whether we can produce sufficient fish at the right price to make the ship a thoroughly paying proposition; time alone will show that. We shall continue to run her and with reasonable confidence. I think it has been a satisfactory maiden voyage and I am not disappointed, though I should have liked to have seen a bigger catch."

The Captain of the Fairytry said: "She is a wonderful fishing ship and has caught a lot of fish. We averaged 400 kits of fish a day for 60 days' fishing off Greenland and the Grand Banks of Newfoundland. We had very fine weather, with calm seas, but a lot of fog."



Stern view of Fairytry. Note chute for trawl net and unusual athwartship gallews.

The Captain said 30 of his crew of 80 had never been to sea before. They were filleters and were not used to it; they suffered a bit at first but gradually settled down and improved until they were doing quite well by the end of the trip.

The Captain also said it was his first experience of a stern trawl. There were certain good things about it and certain drawbacks, but on the whole he thought it was a very good thing. He did not, however, think that it would prove satisfactory in fishing vessels of the conventional type. The stern trawl meant a winch and a fish room astern as well.

In his view, ships of the type of the Fairytry cannot make a living at Iceland, Bear Island, or the White Sea fishing grounds. "To make a ship like this a paying proposition, we have to catch a lot of fish," he said. "We have to have big quantities to keep the filleters going, and that means we have to go to distant grounds like Greenland and Newfoundland." He did not think that a ship of the Fairytry type would supersede conventional trawlers. In his opinion there would always be a place for the normal type of ship, with factoryships proving an addition to the normal fishing fleet.

The Fairytry was due to sail from Immingham about mid-August. Most of the crew remained with the ship, and the owners received a number of applications for berths on this novel type of vessel.

The only mechanical trouble suffered on the maiden voyage was with the gearing of the electric winch but this was soon put right in St. John's, Newfoundland.

Asked if the owners intended to build more ships like the Fairytry, a representative of the owners said they were first going to make the Fairytry a thorough success.

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IMPORT CONTROLS ON CANNED SALMON AND CRAB MEAT LIFTED: Canned salmon and crab meat will be freed from controls in Great Britain on October 1, when private imports will be resumed, the Ministry of Food announced on June 16. The remaining stocks held by the Ministry are expected to be distributed to the trade in September.

Arrangements have been made for limited imports of canned salmon from North America, Japan, and Soviet Russia, under specific license, starting October

1, 1954. Also from the same date, canned crab meat can be imported without restriction from Western Europe, and certain Commonwealth and other countries, a July 23 U. S. Embassy dispatch from London reports.

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CANNED SALMON IMPORTS EXPECTED TO INCREASE: When trade in canned salmon in the United Kingdom is returned to private hands on October 1, the trade expects that import quotas to the end of June 1955 will total almost £5.3 million (US\$14.8 million). Canada and the United States are expected to ship canned salmon valued at £2.5 million (US\$7 million); Japan, £2.0 million (US\$5.6 million); and Russia, £0.8 million (US\$2.2 million).

During last year when the Ministry of Food was the sole importer of canned salmon, purchases totaled 12.1 million pounds, valued at £2.0 million (US\$5.6 million). During the first half of this year imports also totaled 12.1 million pounds, but were valued at £2.2 (US\$6.2 million), according to the August 6 issue of The Fishing News, a British fishery periodical.

Import licensing for canned salmon and other canned fish in New Zealand is to be abolished immediately, a report from Wellington states.

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FILLET SKINNING MACHINE: A new fillet skinning machine has been patented in the United Kingdom, according to the June Trade News, a Canadian Government publication. The machine operates by drawing the fillet past the knife. The knife is first moved to cut perpendicularly through the meat close to the skin and is then intruded to cut between the skin and the meat. The end of the fillet is cut between a small and large roller, and the knife maintained at a constant distance from the larger roller. The fillet is drawn between the rollers. The method is said to be applicable to skinning flatfish, such as plaice, before filleting.

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CASUAL FILLET CUTTERS REFUSE NEW WAGE TERMS: Casual fillet cutters at Hull, England, refused to accept new wage terms offered by leading fish firms and walked out, reports the July 24 Fish Trades Gazette, a British fishery magazine. The new terms provide the payment of 4 s. (56 U. S. cents) per hour for hours actually worked in all circumstances.

The casual filleters had been receiving as much as £2 (US\$5.60) per day, irrespective of the starting time, which often was as late as 10 a.m. The normal finishing time is 5:00 p.m., after which overtime was claimed. The new rate for casual labor was the equivalent of £8 (US\$22.40) for a 5-day week, which was considered to be a fair one in the trade.

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SEINE NET FILM AVAILABLE: The motion picture Fish and The Seine Net produced by the Scottish Home Office is now available on loan or sale from the British Information Service. This film shows the underwater action of a Danish seine which is similar to the otter trawl, and also how the fish react when overtaken by the net. The photography was done by "frogmen" with special underwater cameras. For further information, write to the British Information Service, 30 Rockefeller Plaza, New York 20, N. Y.

The U. S. Fish and Wildlife Service has three prints of this film and has shown them in many fishing communities, especially where trawling is carried on.

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TRAWLER ON TV: Late in July a television cameraman took moving pictures of a British trawler to be shown on a Children's Hour program, reports the July 30 issue of The Fishing News, a British fishery magazine.

The program will tell the story of the adoption of the trawler, the 21st to be adopted by a school, and show how the fish is landed and placed on rail for transportation inland. Other shots will show the arrival of the fish in Oxford and its journey to the dinner table.

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INCREASED SUBSIDIES FOR FISHING VESSELS SOUGHT: Increases in subsidy payments to whitefish vessels (between 70 feet and 140 feet in length) fishing inshore, near, and middle waters were laid before Parliament in July by the Minister of Agriculture and Fisheries and the Secretary for Scotland. If confirmed by Parliament, they would come into operation on August 1 and last until July 31, 1955.

The new subsidy will amount to £1 (US\$2.80) per day for the smaller vessels, and more for the larger vessels.

The changes proposed are: increases in the maximum subsidy payable for motor and steam vessels of 100 feet to 140 feet, and increases in the maximum gross proceeds up to which subsidy is payable for these vessels; increases in the maximum gross proceeds up to which subsidy is payable for steam vessels of 70 feet to 99 feet.

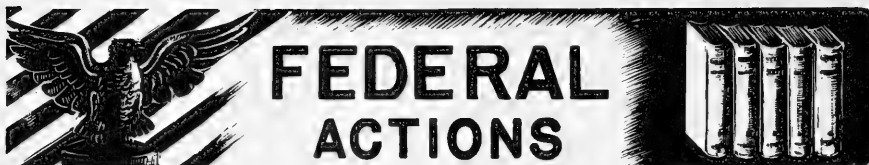
The scheme also provides that if any structural alterations are made to a vessel to increase its length with the result that it moves into a higher subsidy class, grants may nevertheless continue to be paid at the rate appropriate to the vessel's length before the change unless the appropriate Minister has agreed in writing to pay at a higher rate.



ALUMINUM FRESH FISH CONTAINERS IN GRIMSBY

A new method of transporting fresh fish in lightweight containers is being used in Grimsby, England. The containers are made of Duralumin and lined with another special anticorrosive aluminum alloy. The containers are stated to be unaffected by brine, are easily cleaned, and do not become impregnated with the smell of fish. Drainage channels are formed in the aluminum alloy bottom. The containers measure 13 ft. 10 in. x 6 ft. 10 in. x 5 ft. 9 in.

--World Fish Trade, July 1953.



Department of Health, Education, and Welfare

NATIONAL CONFERENCE ON SHELLFISH SANITATION: Almost 100 representatives of Federal, State, and Canadian health and fisheries agencies and of the shellfish industry attended the first national conference on shellfish sanitation in almost 30 years. It was held September 9 and 10, in Washington, D. C. The conference was called by the Surgeon General of the Public Health Service, Department of Health, Education, and Welfare, to discuss problems of both domestic and international significance.

On the domestic side, it was unanimously agreed that the voluntary, cooperative Federal-State-Industry sanitation control program be continued, with certain technical changes, but essentially in its present form. Under this system, the states assume primary responsibility for sanitation of shellfish production and processing. The Public Health Service will continue to develop uniform standards, evaluate and endorse the state programs which meet its standards, and issue periodic lists of state-certified dealers.

Speaking for the producing states, Dr. Mack I. Shanholtz, Virginia State Health Officer, pointed out that shellfish-regulatory agencies are expending large amounts of time and money to insure that shellfish are not harvested from sewage-polluted areas. Action may range from simple closure of such an area to the construction of sewage-treatment facilities.

"Virginia is the largest shellfish-producing State, but these problems face all other producing States as well," Dr. Shanholtz said. In the face of our ever-increasing population, "it is a constant

race to keep sewage-treatment facilities adequate to the expanding pollution problem," he observed.

"Sanitary control is the foundation upon which the industry is built," it was asserted by David H. Wallace, director of the Oyster Institute of North America, who spoke also for the Pacific Coast Oyster Growers Association. Because of the shellfish industry's interest in producing a safe product, he said, the industry wants the cooperative program to continue.

The need for all states to check on the sources and marketing of shellfish sold within their borders was stressed by Dr. Grady F. Mathews, Oklahoma State Health Officer, who compared the shellfish industry to the milk industry with respect to the need for sanitary controls. He urged all interior states to take steps to insure that only certified shellfish be sold. The interior states are becoming more important in shellfish marketing, he pointed out, with the development of new methods of freezing, changes in merchandizing methods, and advances in express rates on small shipments leading to the location of repacking and breeding and freezing plants in interior states.

The same advances in freezing techniques give rise to the international problems, according to experts who addressed the conference. H. Gerald Smith, of the State Department, noted that dollar-short countries with a surplus of shellfish are eager to take advantage of these developments in order to help stabilize their economies. He recognized, however, that "the many sanitation and administrative problems involved in the shipment of shellfish from distant countries to the United States will have to be solved" before they would be able to market appreciable quantities here.

John Harvey, Associate Commissioner of Food and Drug Administration, and Richard S. Green, chief of the Public Health Service's Shellfish Branch, agreed that "many difficult problems must be solved before the Department of Health, Education, and Welfare and other Federal agencies concerned can work out satisfactory methods for dealing with shipments." The industry's point of view, as expressed by J. R. Nelson, of Madison, Connecticut, president of the Oyster Institute of North America, was that "the same rigid controls which have been placed over domestic producers should be applied to foreign producers."

The Department of State, the Food and Drug Administration and the Public Health Service of the Department of Health, Education, and Welfare, and the Fish and Wildlife Service of the Department of Interior will cooperate in a study of these problems, at the request of the state and industry representatives at the conference.

This is the resolution passed at the Conference:

"During 1924 and 1925, outbreaks of typhoid fever occurred in New York, Washington, Chicago and several other cities. Epidemiological investigation indicated sewage-polluted oysters to be the cause of this illness. The resulting publicity nearly ruined the shellfish industry. To reestablish public confidence in the use of raw fresh shellfish as food, the industry and certain governmental agencies appealed to health authorities for assistance. A meeting of all interested persons was held in Washington, D. C., on February 19, 1925, with the Surgeon General of the U. S. Public Health Service presiding, to formulate a plan for sanitary control of the shellfish industry.

"As a result of this meeting, a system of shellfish-sanitation control was developed which placed the primary responsibility for the maintenance of sanitary control upon the state agencies. The function of the U. S. Public Health Service was to assist in development of uniform standards, review state programs, and advise receiving states of the

effectiveness of the shellfish-sanitation programs in the producing states. Now, therefore,

"WHEREAS, to safeguard public health, there is a continuing need for a program for sanitary control of shellfish processing and distribution in receiving areas, and

"WHEREAS, the establishment of adequate control measures in both producing areas and receiving areas will assist the shellfish industry and provide protection for the ultimate consumer, therefore, be it

"RESOLVED,

"1. That the present policy of Federal-state and Industry cooperative relationship be continued including the listing of certified shellfish dealers by the U. S. Public Health Service based on its endorsement of the various State programs.

"2. That the Public Health Service shall develop specific minimum requirements for endorsing state shellfish programs which shall take into account varying geographic and other conditions and the various species of shellfish grown therein.

"3. That the certification of shellfish packers and repackers, with endorsement of satisfactory state programs by the U. S. Public Health Service, be developed in all receiving states.

"4. That all states be encouraged to require that only shellfish from certified dealers be permitted to be sold.

"5. That the program for sanitary control of the shellfish industry shall be maintained throughout the year in both producing and receiving states.

"6. That the Public Health Service shall maintain a staff to carry out its responsibility in this program, including the necessary research and consultation service.



Department of the Interior

FISH AND WILDLIFE SERVICE

EXPANDED FISHERY RESEARCH PROGRAM APPROVED BY SECRETARY

MCKAY: Approval of a greatly expanded research program designed to strengthen the United States commercial fishing industry was announced September 10 by Secretary of the Interior Douglas McKay.

The research program will be carried out by the Fish and Wildlife Service under the terms of the Saltonstall-Kennedy Bill (Public Law 466, 83rd Congress). This legislation provides that an amount equal to 30 percent of duties collected under the customs laws on fishery products be transferred annually for three years from the Department of Agriculture to the Department of the Interior. The basic purpose of the legislation is to "promote the free flow of domestically produced fishery products in commerce." Expenditures for any one year may not exceed \$3,000,000.

Projects initially approved by Secretary McKay call for the expenditure of approximately \$1,800,000. The balance of the allocation will await the consideration of an advisory committee which will be appointed in the near future. This committee will comprise representatives of all segments of the fishing industry and will be invited to propose and review research projects and to recommend priorities for activities by types and areas.

The \$3,000,000 research fund allocated under the Saltonstall-Kennedy bill supplements \$3,593,000 appropriated to the Fish and Wildlife Service to carry on authorized research programs. These programs include \$2,485,000 for fish and fisheries and \$1,108,000 for exploration and utilization of fish and fish products. Included in the first of these programs is the extensive work now being carried on by the Service on the Great Lakes sea lamprey and the Florida red tide scourge. In addition, \$50,000 has been appropriated for research on escapement of fish in connection with the construction of multiple-purpose dams.

The majority of the projects approved under Public Law 466 funds are recognized by the industry as requiring immediate attention. Secretary McKay pointed out that in most instances they parallel programs either under way or which have been postponed previously because of the lack of funds.

The Fish and Wildlife Service is authorized to conduct an expanded fishery educational service, as well as technological, biological, and related research programs. The transferred funds will also be available for the "purchase or other acquisition, construction, equipment, operation, and maintenance of vessels or other facilities necessary for conducting the required research."

The projects now approved provide for increased activities at many points in the United States and in Alaska. A statement listing the types of projects and the localities in which they will be carried on follows:

BIOLOGICAL RESEARCH AND INVESTIGATIONS

MAINE HERRING INVESTIGATION (\$74,000). A study of New England herring populations will be undertaken to discover reasons for the fluctuations in abundance and to develop means of predicting the catch. This will be a cooperative investigation conducted with the Exploratory and Gear Development unit. Headquarters for the activity will be at a point on the Maine Coast.

NORTH ATLANTIC FISHERIES (\$205,000). A study of flounder, sea scallop, whiting, and ocean perch fisheries will be undertaken to determine the condition of these fisheries in order to devise methods of conserving the fisheries and to obtain information for the use of the industry concerning supplies of fish and shellfish, and trends of the fisheries. These activities will be carried on from the Service's Woods Hole, Mass., laboratory.

OYSTER INVESTIGATIONS (\$75,000). Studies of the oyster fisheries of the Atlantic and Gulf Coasts will be conducted to learn more about seed-oyster production, control of drill damage, and other possibilities for improved cultivation of these shellfish. These activities will be conducted from Milford, Conn.; Annapolis, Md.; Pensacola, Fla.

GULF OF MEXICO SHRIMP INVESTIGATIONS (\$80,000). The shrimp populations of the Gulf will be studied to determine the effects of environmental changes on shrimp production, in order to provide information necessary to maintain the production of these shellfish. Headquarters for this activity will be at Galveston, Texas.

RED TIDE INVESTIGATIONS (\$20,000). This amount will supplement and strengthen studies being conducted to determine the combination of environmental factors which "trigger-off" blooms of *Gymnodinium brevis*, the organism which causes extensive fish kills in west coast Florida waters. Headquarters for these investigations are at Fort Meyers, Fla.

PACIFIC SARDINE, ANCHOVY, AND MACKEREL INVESTIGATIONS (\$125,000). Cooperative research will be conducted to determine reasons for the recent decline in the sardine fishery and to learn the distribution, abundance, and reasons for fluctuations in the numbers of sardine-like fish in Pacific Coast waters. Studies of the anchovy and

mackerels will be carried on concurrently. Headquarters for the staff in this research will be at La Jolla, Calif.

NORTH PACIFIC ALBACORE INVESTIGATIONS (\$234,000). Biological, oceanographic, and fishing studies will be conducted to locate and determine abundance of albacore tuna in waters north and west of Hawaii. The project will be conducted from the Service's laboratory at Honolulu, T. H., and will be coordinated through the Pacific States Marine Fisheries Commission.

EXPLORATORY FISHING, STATISTICAL, TECHNOLOGICAL, EDUCATIONAL, MARKET DEVELOPMENT, AND ECONOMIC RESEARCH AND SERVICES

Exploratory Fishing and Gear Development:

MAINE HERRING EXPLORATION (\$76,000). An exploratory fishing and gear research program will be undertaken for the purpose of increasing herring production in cooperation with a biological research program. This activity will be based at a suitable point on the coast of Maine.

NORTH ATLANTIC EXPLORATIONS (\$160,000). A program will be carried on to find new fishing grounds off the New England Coast, and to develop improved fishing methods. This activity will be based at Boston, Mass., and will utilize the Service's technological research vessel Delaware.

Commercial Fishery Statistics:

The collection and dissemination of commercial fishery statistics will be expanded and expedited in many parts of the country. The monthly and annual economic and biological statistical surveys of the domestic fisheries will be issued more promptly; coverage will be strengthened in areas where the collection of data has been weak; and a program will be established for the collection of detailed statistics on the shrimp industry in the South Atlantic and Gulf States. Supervision of the surveys, publication of the data collected, and contracts for special field surveys will be handled from Washington, D. C., at a cost of \$53,000. Personnel assigned to conduct the statistical surveys will be stationed in the following localities:

ATLANTIC COAST (\$33,000), Gloucester, Mass. Providence, R. I. Solomons, Md. Beaufort, N. C. Beaufort, S. C. Brunswick, Ga. Coral Gables, Fla.	GULF COAST (\$60,000): Key West, Fla. Fort Meyers, Fla. Tampa, Fla. Pascagoula, Miss. Biloxi, Miss. New Orleans, La. Houma, La. Morgan City, La. Galveston, Texas Aransas Pass, Texas Brownsville, Texas
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MID-WEST (\$13,000):
Ann Arbor, Mich.
La Crosse, Wis.
New Orleans, La. (headquarters employee will survey lower Mississippi River)

PACIFIC COAST (\$6,000):
Astoria, Ore.
San Pedro, Calif.

Technological Studies:

GULF AND SOUTH ATLANTIC OYSTER RESEARCH (\$40,000): A program to develop the most suitable methods for handling, freezing, and packaging Southern oysters in the Gulf and South Atlantic producing areas. The research will be conducted under contract by qualified laboratories and at the Service's College Park, Maryland, laboratory.

Economic Research (\$143,000):

Consumption of fishery products will be studied in public eating places, institutions, etc., which serve 60 million people daily, in order to obtain information useful in increasing markets for fish and shellfish.

Comprehensive economic surveys, similar to that prepared on the domestic tuna industry, will be made for other important fisheries, such as shrimp, scallops, Maine sardines, etc., to indicate trends and strengthen their competitive position. These studies and surveys will be supervised from Washington, D. C., and include a very large amount of contract research with qualified research organizations in the economic field.

Fishery Education and Market Development:

There will be an expansion of the school lunch, locker, and special marketing activities, and inauguration of a program for the development of foreign markets for fishery products. These funds are in addition to the \$175,000 that the Service received as a result of legislation now superseded by P. L. 468. This brings the total for this activity to \$300,000. Employees to be assigned to these new activities will be stationed in the following localities:

ATLANTIC COAST (\$101,500): College Park, Md. Washington, D. C. Atlanta, Ga. Coral Gables, Fla. (contract with University of Miami)	PACIFIC COAST (\$16,000): Seattle, Wash. San Pedro, Calif. GULF COAST (\$7,500): New Orleans, La.
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ADMINISTRATION

ADMINISTRATIVE SERVICES (\$91,500). Inauguration of the expanded research program authorized by P. L. 468 will require additional employment and expenditures in the Service's Division of Administration in Washington, D. C., and in the various regional offices for increased fiscal, personnel, and similar administrative activities.

CONSTRUCTION SURVEYS AND ENGINEERING STUDIES (\$43,000). Surveys and engineering studies will be made to develop plans for the construction of fishery laboratories at Woods Hole, and Boston, Mass.; Pascagoula, Miss.; and Seattle, Wash.

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JOINT AGREEMENT FOR SOUND WILD-LIFE PLANNING ON RIVER BASIN

PROJECTS: An interagency agreement between the Corps of Engineers, Department of the Army, and the Fish and Wildlife Service of the Department of the Interior to promote sound planning of fish and wildlife facilities on river basin projects was announced August 31.

The agreement signed by Acting Secretary of the Interior Ralph A. Tudor and Secretary of the Army Robert T. Stevens represents a forward step in the program of cooperation between the Corps

and the Fish and Wildlife Service and is designed to provide for the preservation of fish and wildlife resources in the development of irrigation, navigation, flood control, and power multipurpose projects.

Uniform procedures are set forth in the agreement for the incorporation of recommendations of the Fish and Wildlife Service, as well as the State Fish and Game Departments, in project reports submitted to Congress by the Corps of Engineers. General plans will be developed jointly by the two Federal agencies and the appropriate State agency where either the Federal or State wildlife agencies desires to make use of the resources of completed projects. Maximum practicable public benefits for wildlife conservation will be sought on a local, regional, and national scale.

The agreement provides, among other things, that both gains and losses to wildlife will be considered, and that the recommendations of the Fish and Wildlife Service will be as specific as possible as to purpose, costs, results expected, and related matters. The agreement also provides that, as a general policy, leases of project lands by the Corps of Engineers for agricultural purposes shall specify that the lands shall be open for public hunting and fishing. Reports of the Corps of Engineers on projects where effects on fish and wildlife resources are significant shall include fish and wildlife conservation as one of the project purposes.

This agreement establishes definite guidance for personnel of both agencies in the preparation of project proposals within the framework of the Coordination Act of 1946.

TERHUNE APPOINTED ASSISTANT REGIONAL DIRECTOR: Hugh W. Terhune has been appointed Assistant Regional Director of the Fish and Wildlife Service's regional office in Atlanta, Georgia, the Department of the Interior announced August 23. He succeeds Walter A. Gresh who became Regional Director after the retirement of James

Silver. Terhune reported for duty in Atlanta about September 10.

Terhune has been assistant chief of the Branch of Alaska Fisheries at the central office in Washington since 1950.

As administrator of the Service's Philippine Fisheries Rehabilitation Program in the 1940's, Terhune directed the work of revitalizing the Philippine Republic's commercial fisheries.

He was also executive officer of the Alaska Game Commission, manager of the White River National Wildlife Refuge in Arkansas, chief of the division of construction and CCC operations, and area coordinator of fisheries for the State of California.



State Department

HEARINGS ON REVIEW OF GATT: Public hearings concerning possible changes in the general provisions of the General Agreement on Tariffs and Trade were held by the State Department in Washington, D. C., September 13-17. The hearing was conducted under the direction of the Chairman of the United States Delegation for the review and renegotiation of the General Agreement which will take place in Geneva beginning November 8. These hearings relate to the general provisions of the General Agreement and not to individual commodities or tariff rates.

Major matters which are listed for possible consideration at the review in Geneva are:

1. Organizational provisions of GATT.
2. Special treatment for underdeveloped countries.
3. Agricultural quotas and export subsidies (covered in present Agreement primarily by GATT Articles XI and XVI).
4. Import restrictions for balance-of-payments reasons (covered in present Agreement primarily by GATT Articles XII through XV).

Provisions relating to duration of tariff concessions (Article XXVIII).

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PUBLIC VIEWS REQUESTED ON THE FIRM LIFE OF INDIVIDUAL TARIFF CONCESSIONS IN GATT: Public views were requested by the U. S. State Department on September 21 regarding the status of tariff concessions granted in the General Agreement on Tariffs and Trade in view of the possibility of modification of Article XXVIII of the Agreement, a State Department release points out.

Article XXVIII, as it stands at present, provides that on or after July 1 1955, any country may withdraw tariff commitments with regard to any particular product. However, a country wishing to withdraw a concession first must try to reach some basis of agreement with other interested contracting parties concerning such withdrawal. A possible basis for agreement would be the granting of new concessions as compensation for the withdrawn concession. If such efforts to arrive at agreement fail, the country can nevertheless proceed with its intended action and the other interested country then becomes free to withdraw equivalent concessions in order to restore balance in the Agreement.

Because of concern that extensive use of the unilateral procedure might lead to a rather rapid increase in world tariffs, the date at which this procedure might become available, which originally was January 1, 1951, has twice been postponed. Proposals to modify the application of Article XXVIII are expected to be made at the Ninth Session of the General Agreement which opened on October 28.

Interested persons were invited to express views with regard to any aspect of this matter, including the general question of modification of the Article as well as possible changes in individual concessions which the United States has received or granted. Such views will be carefully considered before a final decision is reached as to the United States position. Certain views on this subject were presented at the hearings on the GATT review of September 13 through 17, held by the U. S.

Delegation to the Review Session. These views were made available to the trade agreements organization for consideration along with information and views presented at the October hearings.

Written views were to be submitted to the Committee for Reciprocity Information, the interdepartmental organization which receives views with regard to trade agreement matters, by October 18. Public hearings were also held by the Committee beginning October 18.

Article XXVIII now provides, in effect:

1. On or after July 1, 1955^{1/} any contracting party may, by negotiation and agreement with any other contracting party with which such treatment was initially negotiated, and subject to consultation with such other contracting parties as the CONTRACTING PARTIES determine to have a substantial interest in such treatment, modify, or cease to apply, the treatment which it has agreed to accord under Article II to any product described in the appropriate Schedule annexed to this Agreement. In such negotiations and agreement, which may include provision for compensatory adjustment with respect to other products, the contracting parties concerned shall endeavour to maintain a general level of reciprocal and mutually advantageous concessions not less favourable to trade than that provided for in the present Agreement.

2. (a) If agreement between the contracting parties primarily concerned cannot be reached, the contracting party which proposes to modify or cease to apply such treatment shall, nevertheless, be free to do so, and if such action is taken the contracting party with which such treatment was initially negotiated, and the other contracting parties determined under paragraph 1 of this Article to have a substantial interest, shall then be free, not later than six months after such action is taken, to withdraw, upon the expiration of thirty days from the day on which written notice of such withdrawal is received by the CONTRACTING PARTIES, substantially equivalent concessions initially negotiated with the contracting party taking such action.

^{1/}The applicable date in paragraph 1, in the case of Brazil, is January 1, 1954.

(b) If agreement between the contracting parties primarily concerned is reached but any other contracting party determined under paragraph 1 of this Article to have a substantial interest is not satisfied, such other contracting party shall be free, not later than six months after action under such agreement is taken, to withdraw, upon the expiration of thirty days from the day on which written notice of such withdrawal is received by the CONTRACTING PARTIES, substantially equivalent concessions initially negotiated with a contracting party taking action under such agreement.

In a statement at the opening of review hearings on the general agreement on tariffs and trade, Assistant Secretary of State Samuel C. Waugh pointed out that in a message to Congress on March 30, 1954, the President stated his intention to renegotiate the organizational provisions of the GATT and to submit the results of this renegotiation to the Congress for its approval. The President stated further that the United States will "suggest to other Contracting Parties revisions of the substantive provisions of the Agreement to provide a simpler, stronger instrument contributing more effectively to the development of a workable system of world trade."

As directed by the President, the United States Delegation, which included representatives of the appropriate agencies of the Executive Branch, discussed the merits of a review of the Agreement with other GATT adherents. There was general agreement that a review of the Agreement in the light of experience since it was first put into effect in 1948 is now appropriate, and the review is scheduled to open in Geneva on November 8.



Tariff Commission

SUGGESTIONS ON IMPLEMENTATION OF CUSTOMS SIMPLIFICATION ACT OF 1954 INVITED: Title I of the Customs Simplification Act of 1954, approved Sep-

tember 1, 1954, directs the Tariff Commission to make a comprehensive study of the laws of the United States prescribing the tariff status of imported articles and to submit to the President and to the Chairmen of the Ways & Means Committee of the House of Representatives and the Finance Committee of the Senate, within two years, a revision and consolidation of these laws, which in the judgement of the Commission, will to the extent practicable--

- (1) Establish schedules of tariff classifications which will be logical in arrangement and terminology and adapted to the changes which have occurred since 1930 on the character and importance of articles produced in and imported into the United States and in the markets in which they are sold.
- (2) Eliminate anomalies and illogical results in the classification of articles.
- (3) Simplify the determination and application of tariff classifications.

The Tariff Commission has initiated the study, and at this stage thereof the Commission invites importers, domestic producers, customs brokers, and other interested parties to submit any suggestions they may have to offer which in their opinion will accomplish the purposes above indicated. Suggestions should be in quintuplicate and should be addressed to the General Counsel, United States Tariff Commission, Washington 25, D. C.

No hearings will be held in connection with this study until after the Commission has completed its review of the tariff classification laws and has prepared a draft of revised tariff schedules. Hearings will then be scheduled for the purpose of affording interested parties opportunity to be heard with regard to the proposed revised tariff schedules, particularly with respect to the probable effect upon domestic industry of any incidental changes in duties which may be involved in the proposed revision.



Eighty-Third Congress

(Second Session)

AUGUST 1954

Listed below are public bills and resolutions introduced and referred to committees or passed by the Eighty-Third Congress (Second Session) and signed by the President that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown in this section only when introduced and, if passed, when signed by the President; but also shown are the more pertinent reports, hearings, or chamber actions on some of the bills shown in this section from month to month.

CUSTOMS SIMPLIFICATION ACT: On September 1 the President signed H. R. 10009, a bill to simplify customs procedures. (P. L. 765). The Act authorizes the Tariff Commission to review customs tariff schedules, and transfers from the Treasury Department to the Tariff Commission the task of deciding whether dumping of goods by foreign countries in the United States market has resulted in injury to domestic producers. The Act requires the Tariff Commission to report to Congress by March 18, 1955, indicating the significant problems that have developed and suggesting standards and methods which might be adopted for simplification of existing tariff schedules without significant changes in tariff levels.

One section of the Law which may be of considerable importance in the future reads:

"Sec. 401.**** Sec. 301. Insular Possessions.

"There shall be levied, collected, and paid upon all articles coming into the United States from any of its insular possessions, except Puerto Rico, the rates of duty which are required to be levied, collected, and paid upon like articles imported from foreign countries; except that all articles the growth or product of any such possession, or manufactured or produced in any such possession from materials the growth, product, or manufacture of any such possession or of the United States, or of both, which do not contain foreign materials to the value of more than 50 per centum of their total value, coming into the United States directly from any such possession, and all articles previously imported into the United States with payment of all applicable duties and taxes imposed upon or by reason of importation which are shipped from the United States, without remission, refund, or drawback of such duties or taxes, directly to the possession, from which it is being returned by direct shipment, shall be admitted free of duty upon compliance with such regulations as to proof of origin as may be prescribed by the Secretary of the Treasury. In determining whether an article produced or manufactured in any such insular possession contains foreign materials to the value of more than 50 per centum, no material shall be considered foreign which, at the time such article is entered, or withdrawn from warehouse, in the United States for consumption, may be imported into the United States from a foreign country, other than Cuba or the Philippine Republic, free of duty.

"Sec. 402. (a) Section 28 (d) of the Revised Organic Act of the Virgin Islands, approved July 22, 1954, is amended to read as follows:

"(d) All articles coming into the United States from the Virgin Islands shall be subject to or exempt from duty as provided for in section 301 of the Tariff Act of 1930 and subject to internal-revenue taxes as provided for in section 7652 (b) of the Internal Revenue Code of 1954.

"(b) Section 27 of the Act of August 1, 1950 (64 Stat. 392; U.S.C., 1952 edition, title 48, sec. 1421e), is amended to read as follows:

"Sec. 27. All articles coming into the United States from Guam shall be subject to or exempt from duty as provided for in section 301 of the Tariff Act of 1930."

The Senate Finance Committee's report on these sections is as follows:

"Section 401

"Section 401 of the bill would add a new section to title III of the Tariff Act of 1930 to provide for the duty status of importations from the insular possessions of the United States. The new section would provide that all articles imported from an insular possession of the United States, except Puerto Rico, shall be dutiable at the same rates as are importations from foreign countries, except those which (1) are entirely of native origin or (2) are manufactured in such possession and do not contain over 50 percent of foreign materials or (3) are articles previously imported into the United States with full payment of duties and taxes which have been shipped from the United States directly to the possession without remission, refund, or drawback of such duties or taxes. This proposal would result in equal treatment for all the insular possessions of the United States, except Puerto Rico which is within the customs territory of the United States.

"Section 402

"Section 402 of the bill would amend present law to make it clear that Guam and the Virgin Islands come within the general provision for importations from insular possessions added by section 401. Under existing law all products of Guam are duty free, whereas products of the Virgin Islands are subject to duty if they contain over 50 percent of foreign material."

DUTY ON FISH STICKS: The President on August 28 signed H. R. 8628, a bill containing an amendment to provide a 20 percent ad-valorem duty on breaded uncooked and 30 percent on cooked fish sticks and similar products of any size or shape, fillets, or other portions of fish (P. L. 889). The Law shall enter into effect as soon as practicable on a date to be specified by the President in a notice to the Secretary of Treasury following such negotiations as may be necessary to effect a modification or a termination of the international obligations of the United States with which the amendment would be in conflict. The Law reads:

H. R. 8628

AN ACT

111 48 STAT. 898.

To amend the Tariff Act of 1930 to insure that crude silicon carbide imported into the United States will continue to be exempt from duty, and with respect to the dates applicable to certain prepared fish.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That paragraph 5115em section 5, 1930 of the Tariff Act of 1930, as amended, is amended by inserting 46 Stat. 677, "crude silicon carbide," after "corundum ore."

Sec. 2. (a) Paragraph 720 of title I of the Tariff Act of 1930 now reads: (U. S. C., 1952 edition, title 19, sec. 1001, par. 720), is amended by 46 Stat. 633, adding at the end thereof the following subparagraph:

"(d) Fish sticks and similar products of any size or shape, fillets, or other portions of fish, if breaded, coated with batter, or similarly prepared, but not packed in oil or in oil and other substances, whether in bulk or in containers of any size or kind, and whether or not described or provided for elsewhere in this Act, if uncooked, 20 per centum ad valorem; cooked in any degree, 30 per centum ad valorem."

The foregoing amendment shall enter into effect as soon as practicable on a date to be specified by the President in a notice to the Secretary of the Treasury following such negotiations as may be necessary to effect a modification or a termination of the international obligations of the United States with which the amendment would be in conflict.

Approved August 28, 1954.

LABELING OF FOREIGN-PRODUCED TROUT: The President on September 2 vetoed S. 9033 relating to the labeling of packages containing foreign-produced trout sold in the U. S., and requiring certain information to appear on a placard in public eating places serving such trout. In vetoing the measure, designed to protect domestic trout growers, the President stated that the present Tariff Act and the Food, Drug and Cosmetic Law provide sufficient safeguards if thoroughly enforced.

PROTECTION OF U. S. VESSELS ON HIGH SEAS: The President on August 27 signed H. R. 9584, a bill to protect the rights of vessels of the United States on the high seas and in territorial waters of foreign countries. (P. L. 680). The law reads:

H. R. 9584
AN ACT

_____ 411 48 Stat., 883.
To protect the rights of vessels of the United States on the high seas and in territorial waters of foreign countries.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purposes of this Act the term "vessel of the United States" shall mean any vessel or high private vessel documented or certificated under the laws of the United States, etc.

Sec. 2. In any case where--

(a) a vessel of the United States is seized by a foreign country on the basis of rights or claims in territorial waters or the high seas which are not recognized by the United States; and

(b) there is no dispute of material facts with respect to the location or activity of such vessel at the time of such seizure,

the Secretary of State shall as soon as practicable take such action as he deems appropriate to attend to the welfare of such vessel and its crew while it is held by such country and to secure the release of such vessel and crew.

Sec. 3. In any case where a vessel of the United States is seized by a foreign country under the conditions of section 2 and a fine must be paid in order to secure the prompt release of the vessel and crew, the

owners of the vessel shall be reimbursed by the Secretary of the Treasury in the amount certified to him by the Secretary of State as being the amount of the fine actually paid.

Sec. 4. The provisions of this Act shall not apply with respect to a seizure made by a country at war with the United States or a seizure made in accordance with the provisions of any fishery convention or treaty to which the United States is a party.

Sec. 5. The Secretary of State shall take such action as he may deem appropriate to make and collect on claims against a foreign country for amounts expended by the United States under the provisions of this Act because of the seizure of a United States vessel by such country.

Sec. 6. There are authorized to be appropriated such amounts as may be necessary to carry out the provisions of this Act.

Approved August 27, 1954.

SOCIAL SECURITY FOR FISHERMEN: H. R. 9366, providing for expanded coverage and an improved old-age and survivors insurance program, was signed by the President on September 1 (P. L. 761). The bill includes all persons, except minors employed by parents, engaged in the fishing industry. Affected are not only fishermen on boats or vessels, but also fishermen who operate drop nets and haul seines, clam diggers, and employees of commercial trout and other fish farms. The following detailed provisions are of interest to those affected by the new Law.

The new coverage is effective January 1, 1955. The employee's social security tax will be two percent of his wages up to a maximum of \$4200 a year and the employer will contribute a like amount.

The employer is responsible under the law for withholding the employee's tax and reporting wages every three months. Reports are made on Form 941, U. S. Treasury Department, Internal Revenue Services. The report covering the calendar quarter January-March should be made before the end of April.



Editorial Assistants--Ruth V. Keefe; Miss S. Boediningsih, Indonesian trainee, also assisted in the preparation of this issue as part of her training in the United States.

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Betty Coakley, Kathlyn Brophy, & Alma E. Greene

* * * * *

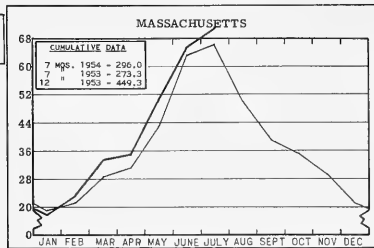
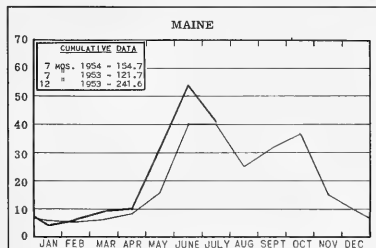
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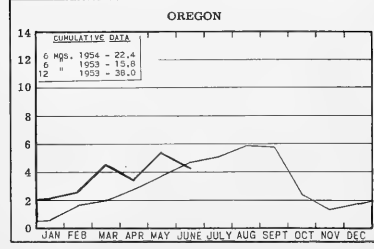
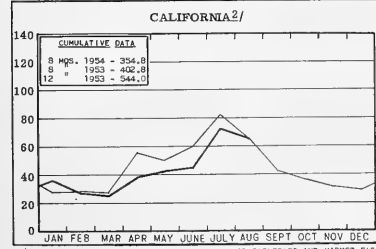
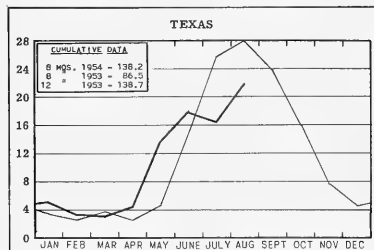
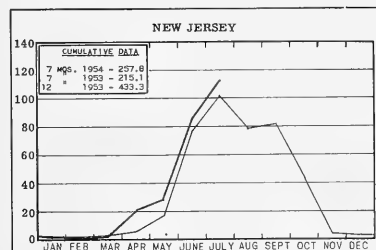
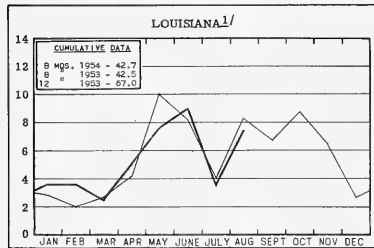
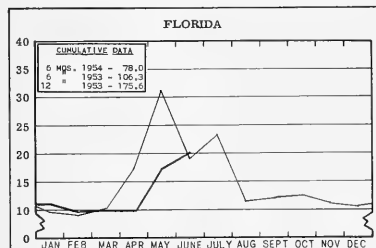
FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds



Legend:
 — 1954
 — 1953

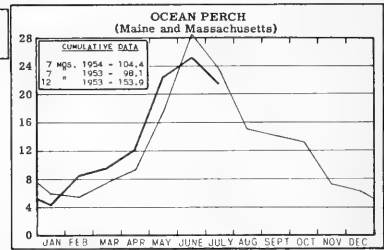
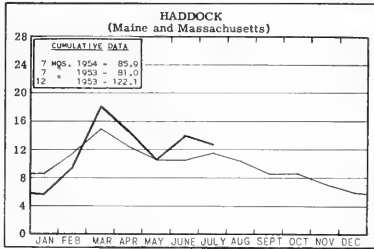


1/ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.

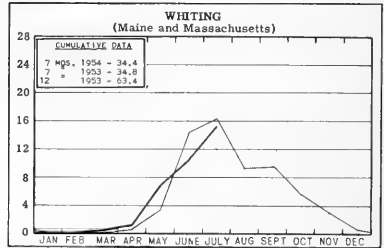
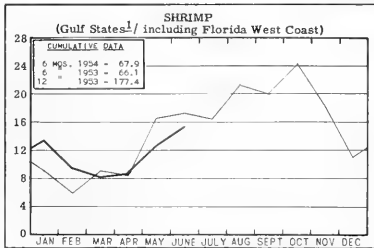
2/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

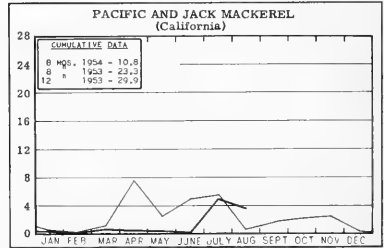
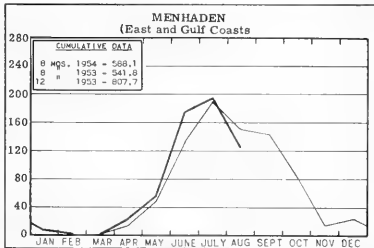


In Millions of Pounds



¹LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

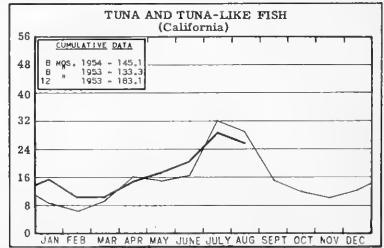
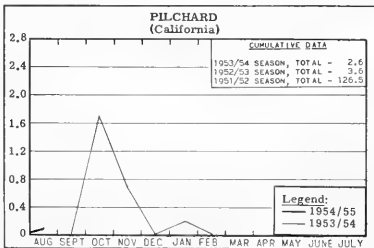
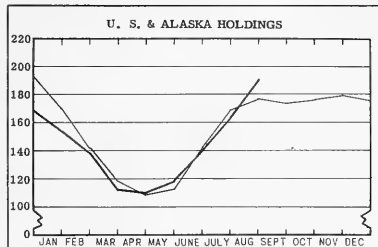
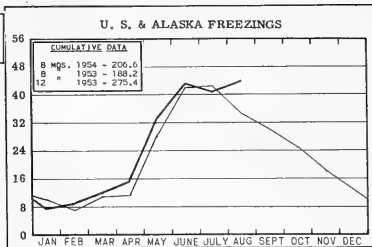


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

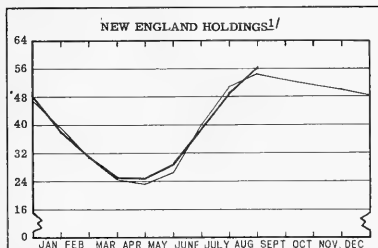
In Millions of Pounds



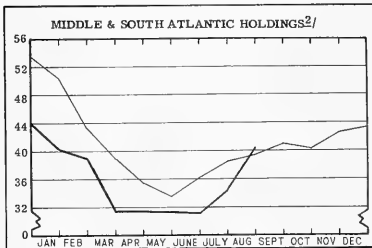
Legend:
— 1954
— 1953



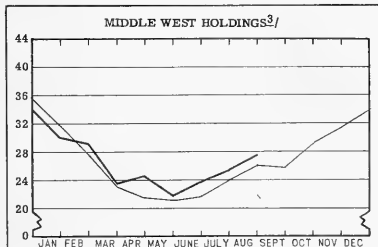
CUMULATIVE DATA
B Mgs. 1954 - 206.4
B " 1953 - 188.2
I2 " 1953 - 275.4



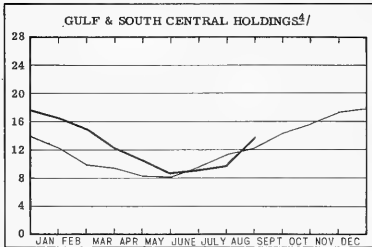
¹/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.



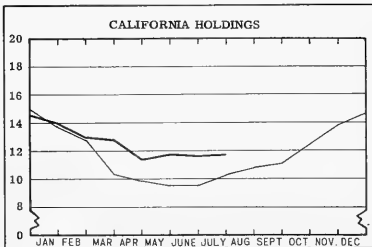
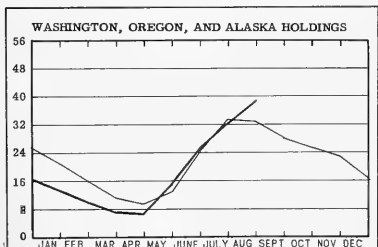
²/ALL EAST COAST STATES FROM N.Y. SOUTH.



³/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



⁴/ALA., MISS., LA., TEX., ARK., KY., & TENN.



*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pound

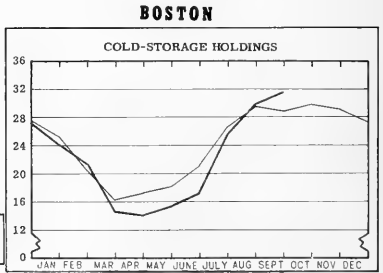
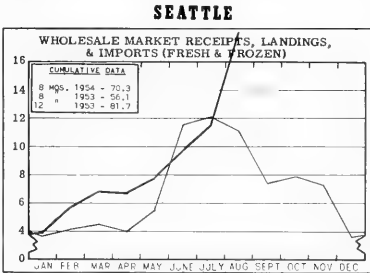
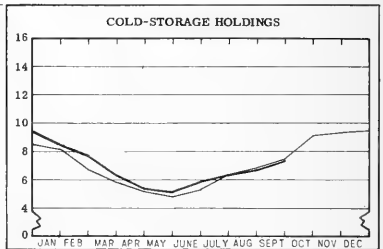
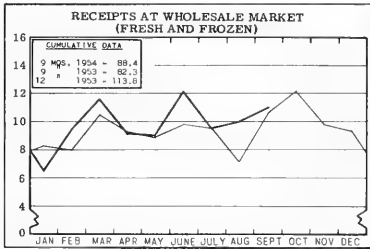
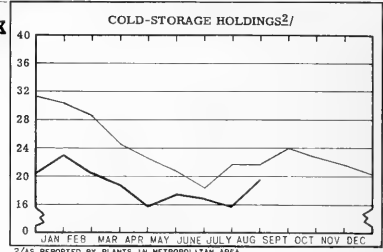
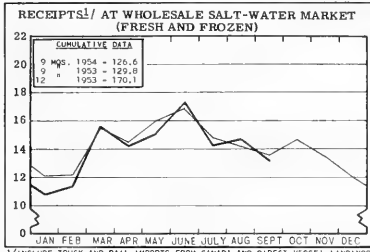


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

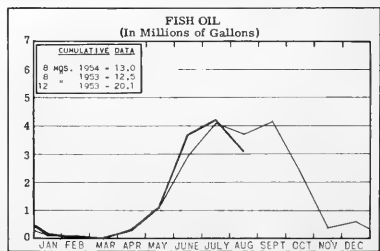
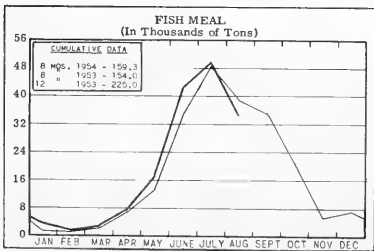
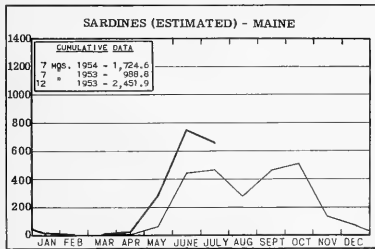
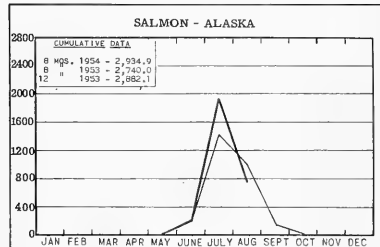
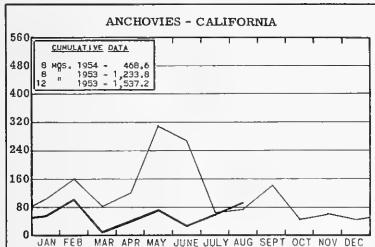
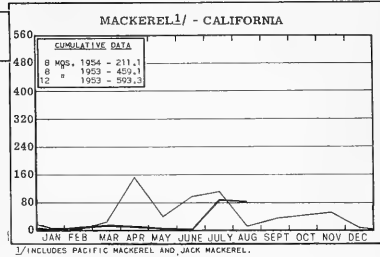
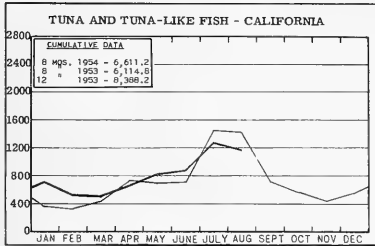


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	1/4 drawn	3 1/2 oz.
SHRIMP	48	--	5 oz.
TUNA	48	No. 1/2 tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	1/2 lb.	8 oz.

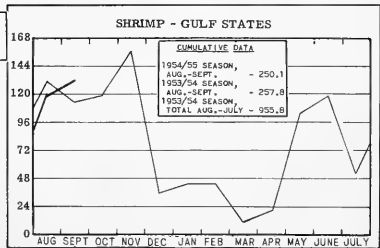
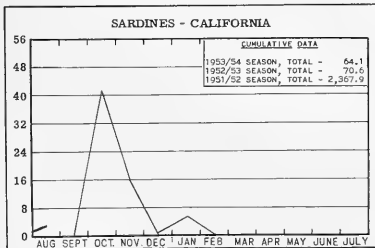
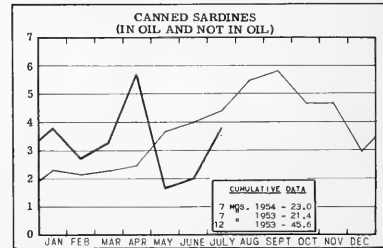
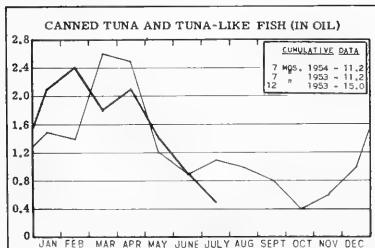
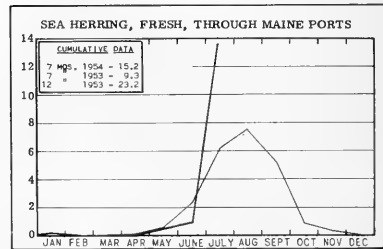
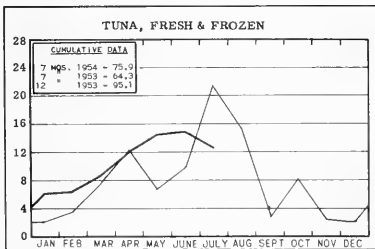
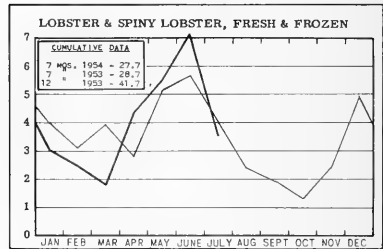
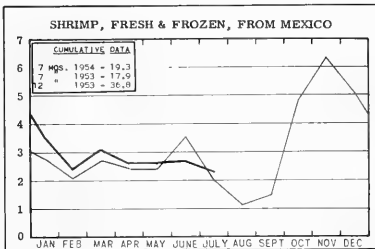
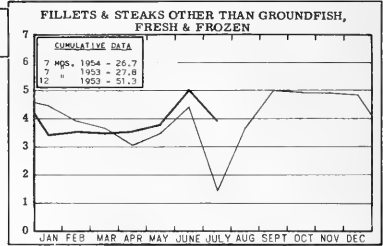
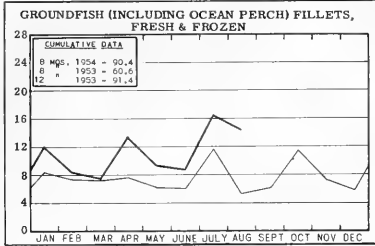


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds

Legend:
 — 1954
 — 1953





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.

FL - FISHERY LEAFLETS.

SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

SSR.-FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

SSR.-WILD - SPECIAL SCIENTIFIC REPORTS--WILDLIFE (LIMITED DISTRIBUTION).

SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|----------|---|
| CFS- 863 | - Packaged Fish, 1952 Annual Summary (revised), 4 pp., |
| CFS-1006 | - Middle Atlantic Fisheries, Annual Summary 1952, 7 pp. |
| CFS-1009 | - Massachusetts Landings, May 1954, 8 pp. |
| CFS-1010 | - New Jersey Landings, May 1954, 2 pp. |
| CFS-1012 | - Florida Landings, April 1954, 6 pp. |
| CFS-1021 | - South Atlantic Fisheries, 1952 Annual Summary, 9 pp. |
| CFS-1023 | - Frozen Fish Report, June 1954, 8 pp. |
| CFS-1024 | - New York Landings, May 1954, 5 pp. |
| CFS-1025 | - Texas Landings, June 1954, 3 pp. |
| CFS-1026 | - Pacific Coast Fisheries, 1952 Annual Summary, 7 pp. |
| CFS-1028 | - Frozen Fish Report, July 1954, 8 pp. |
| CFS-1029 | - Maryland Landings, 1953 Annual Summary, 4 pp. |
| CFS-1030 | - Fish Meal and Oil, June 1954, 2 pp. |
| CFS-1033 | - Mississippi Landings, June 1954, 2 pp. |
| CFS-1034 | - Maine Landings, June 1954, 4 pp. |
| CFS-1035 | - New Jersey Landings, June 1954, 2 pp. |
| CFS-1036 | - New York Landings, June 1954, 4 pp. |
| CFS-1037 | - Alabama Landings, June 1954, 2 pp. |
| FL - 14 | - Pacific Salmon (revised March 1954), 8 pp., processed. |
| FL - 69 | - Markets and Recipes for Fresh-water Turtles (revised), 4 pp. |
| FL - 168 | - Commercial Fishery Laws and Regulations (revised), 8 pp. |
| FL - 176 | - Atlantic Salmon (<i>Salmo salar</i>), revised March 1954, 6 pp., processed. |
| FL - 400 | - List of Fishery Leaflets 301-400, 5 pp., processed. |

WHOLESALE DEALERS IN FISHERY PRODUCTS:

- | | |
|---------|---|
| SL - 3 | - Massachusetts, 1954, 9 pp. |
| SL - 4 | - Rhode Island, 1954 (revised), 2 pp. |
| SL - 5 | - Connecticut, 1954 (revised), 1 p. |
| SL - 13 | - North Carolina, 1954 (revised), 6 pp. |
| SL - 20 | - Texas, 1954, 4 pp. |

- | | | |
|---|--------------|---|
| 1 | Sep. No. 376 | - Analysis of the Hawaiian Long-Line Fishery, 1948-52. |
| | Sep. No. 377 | - Cold-Storage Life of Fresh-Water Fish--No. 1. |
| | Sep. No. 378 | - Tech. Note No. 30 - Proposed Method for Estimating Amount of Solubles Added to Whole Fish Meal. |
| | Sep. No. 379 | - The Development of Federal Specifications. |

SSR-Fish. No. 116 - Progress in Pacific Oceanic Fishery Investigations, 1950-53, by O. E. Sette and the Staff of POFI, 76 pp., illus., processed, February 1954. Summarizes briefly and pictorially the findings of the Service's Pacific Oceanic Fishery Investigations as follows: (1) equatorial hydrographic cruises; (2) 1953 concept of equatorial circulation; (3) surface temperature and phosphate; (4) zooplankton abundance by latitude; (5) zooplankton abundance by longitude and season; (6) food of yellowfin tuna; (7) equatorial long-line fishing cruises; (8) yellowfin tuna catch/100 hooks (July-November); (9) yellowfin tuna catch/100 hooks (January-June); (10) relative abundance of yellowfin tuna in the western equatorial Pacific; (11) seasonal fluctuations in the long-line catch rate in the western Pacific; (12) comparison of catch rates from Japanese commercial and POFI experimental fishing; (13) abundance of yellowfin at 150° W. longitude on successive cruises; (14) tuna spawning near the equator; (15) distribution of tuna larvae in central Pacific; (16) index to racial difference of yellowfin between sample localities; (17) equatorial commercial fishing; (18) acceptance of Cavalieri long-line tuna for canning; (19) variation in size of yellowfin along the Equator; (20) known trans-Pacific distribution of yellowfin tuna; (21) bait resources in the central Pacific; (22) mid-winter sampan fishing in Line Islands; (23) search for bait substitutes; (24) distribution of skipjack catch around the Hawaiian Islands; (25) Hawaiian skipjack landings 1949-1952; (26) survey plan for Hawaii hydrography; (27) winter sightings of skipjack; (28) the Hawaiian long-line fishery; and (29) the age and growth of yellowfin. To avoid the distraction of interspersing references to sources, a summary of the kind and quantity of data underlying the several charts, graphs, and statements is appended, together with a list of publications.

SSR-Fish. No. 120 - Creel Census and Expenditure Study, North Fork Sun River, Montana, 1951, 42 pp., illus., processed, May 1954.

SSR-Fish. No. 124 - Tests of Hatchery Foods for Salmon, 1952, by H. William Newman, David D. Palmer, and Roger E. Burrows, 13 pp., processed, April 1954.

SSR-Fish. No. 127 - Selected Bibliography on Applications of Electricity in Fishery Science, by Vernon C. Applegate, Paul T. Macy, and Virgil E. Harris, 57 pp., processed, April 1954. It is the purpose of this publication to present a selected list of technical, semi-popular, and popular reports, both published and unpublished, which may prove useful to those who are attempting to apply electricity to a specific fishery problem. This bibliography includes reports appearing through the calendar year 1953 which are directly or indirectly related to the application of electric current in or to the water for the purpose of influencing or controlling fish movement or for capturing fishes or other aquatic organisms. Similar uses of light and sound are not included. Coverage of the literature on fundamental researches of the reactions of fishes to electrical stimuli is comprehensive. A selection of references in the general field of electrophysiology and on the reactions of organisms other than fishes to electrical stimulation is included. Coverage of technical and popular accounts of specific applications of electricity in fishery science is likewise comprehensive; both engineering and biological considerations are contained in some of these reports. Further selected reports have been included which may be of aid in instrumentation or which describe useful test instruments. A few papers are cited which discuss the general subject of electrostatic fields; others describe the characteristics of electrical fields in fluid media. Articles dealing specifically with the characteristics of electrical fields in natural waters and the modifying effects of varying natural conditions on these fields appear non-existent. Some information may be gleaned, however, from several of the reports cited which are concerned primarily with other topics. A separate list is presented of patents granted by the United States Patent Office which are pertinent to the subject of this report.

SSR-Fish. No. 129 - Destruction of Undersized Haddock on Georges Bank, 1952, by Ernest D. Premetz, Robert L. Cory, James W. McKee, and Craig Slater, 39 pp., illus., processed, June 1954. This report on the analysis of haddock discarded at sea on Georges Bank during the 1952 haddock year continues a series of annual reports. During 1952 the destruction of undersized haddock on Georges Bank by the Boston and New Bedford fishing fleets (based on skippers' estimates as reported to port interviewers) was about 4.9 million pounds (4.4 million fish). Of this total, about 4.2 million pounds (3.8 million fish), or over 86 percent, was reported by the Boston fleet. The 1952 discard by the Boston fleet approximates the average annual destruction reported during the period 1947-1951. During the 1952 haddock year observers went to sea on 17 commercial trips to the Georges Bank area to analyze the catch. Skippers' estimates of pounds discarded were found to be within 6½ percent of estimates made by the Service observers at sea. In 1951 skippers' estimates were within 12½ percent of estimates made by observers at sea. Most of the destruction was reported during the summer months as in past years. At this time of the year two-year-old fish are attaining a size at which they are caught in quantity but are still not of mar-

ketable size. In 1952 the fishery was dominated by two-year-olds (1950 year class). Usually there is a heavy destruction of scrod when a dominant year class enters the fishery during its third year of life (two-year-olds are in their third year of life). In 1952, however, the destruction was not exceptionally large in spite of the fact that the two-year-olds were very abundant. Older fish were unusually scarce in 1952; the two-year-olds constituted over 62 percent of the total catch. For this reason fishermen tended to save most of them so that the 50-percent point on the cull curve was somewhat lower than in 1951 when the three-year-olds dominated the fishery.

SSR-Fish. No. 132 - Zooplankton Volumes off the Pacific Coast, 1953, 40 pp., processed, June 1954.

SSR-Wild. No. 12 - A Population Study of the Alaska Fur-Seal Herd, by Karl W. Kenyon, Victor B. Scheffer, and Douglas G. Chapman, 82 pp., illus., processed, June 1954.

Selected List of Fish and Wildlife Materials for Conservation Education, 2 pp., processed.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

Receipts of Fishery Products at New York City, 1952, by Henry M. Bearse, 17 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 155 John Street, New York 38, N. Y.) Contains an analysis of fishery products receipts for 1952 and marketing trends at New York City. The author discusses in the first part of this report the salt-water market receipts; marketing trends; receipts by shipping areas; receipts by species; trends in method of transportation; imports of fresh and frozen fishery products through the New York customs district; and fresh-water market receipts. The tables present data for receipts in the salt-water section of Fulton Market by months, species, and points of origin.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

"The Alewife in Fresh Water," by Joseph J. Graham, article, The Progressive Fish-Culturist, vol. 16, no. 3 (July 1954), pp. 128-130, processed (annual subscription \$1.25 domestic, US\$1.65 foreign).

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

The Bay Clams of Oregon--Their Economic Importance, Relative Abundance, and General Distribution, by Lowell D. Marriage, Contribution No. 20, 47 pp., illus., printed. Fish Commission of Oregon, Portland, Oregon, May 1954. The purpose of this paper is to present

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data on distribution, approximate abundance, and habitat of the common bay clams of Oregon with general observations of their life histories. The commercial harvest of bay clams is composed of the gaper, cockle, and soft-shell clams. The recreational, or noncommercial, harvest of bay clams is composed mainly of the gaper, cockle, soft-shell, butter, and littleneck clams, and occasionally the bent-nose, sand, geoduck, and bodega tellen clams. A description of the bay clam-producing areas in the Nehalem, Tillamook, Netarts, Nestucca, Salmon, Siletz, Yaquina, Alsea, Siuslaw, Umpqua, Coos, and Coquille Bays is presented. The condition of the stocks of the gaper, cockle, and softshell clams is discussed.

(Canada) Journal of the Fisheries Research Board of Canada, vol. XI, no. 4, illus., printed, July 1954. Fisheries Research Board of Canada, Ottawa, Canada. Contains, among others, the following articles: "On the Relation of Adult Sockeye Salmon (*Oncorhynchus nerka*) Returns to Known Smolt Seaward Migrations," by R. E. Foerster; "Preparation of Cod Liver Residues and Vitamin B₁₂ Concentrates," by Beryl Truscott, D. G. Gage, and P. L. Hoogland; "Stream Studies on Planted Atlantic Salmon," by H. R. McCrimmon; and "Effect of Olfactory Occlusion on Migrating Silver Salmon (*O. kisutch*)," by Warren J. Wisby, and Arthur D. Hasler.

(Ceylon) Administration Report of the Acting Director of Fisheries for 1953 (Part IV--Education, Science and Art), by E. R. A. de Zylva, 40 pp., illus., printed. Government Publications Bureau, Colombo, Ceylon, June 1954. Progress reports for the year 1953 are presented by the Department of Fisheries' Administration Division, Socio-Economic Division, Development Division, and Research Division. Among the subjects covered are: enforcement of fisheries regulations; improvement of harbor facilities; cooperative development of the fisheries; loans granted to individual fishermen, unregistered fishing groups, and registered cooperative fishing societies; rescue services and relief to fishermen in distress; mechanization of local fishing industry; brackish and freshwater fisheries; fish marketing; curing of fishery products; manufacture of fishery byproducts; and refrigeration and transportation facilities. Statistical data are also included on the production of fresh and cured fish, and imports and exports of fishery products and byproducts.

Channels for Trading Abroad, 30 pp., printed, 25 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This booklet is designed particularly for businessmen who are planning to enter the field of exporting or importing for the first time or to expand their trade abroad. It gives a quick picture of the principal channels through which successful foreign traders export or import their goods. It suggests methods of selecting these representatives and gives sources of in-

formation about them. And it outlines services in this field which are available from the Bureau of Foreign Commerce and Department of Commerce Field Offices throughout the United States.

Cooking Frozen Meats, Poultry, Game, and Fish, by Faith Fenton, Cornell Extension Bulletin 906, 16 pp., illus., printed. New York State College of Home Economics at Cornell University, Ithaca, New York, February 1954. This bulletin attempts to answer some of the questions homemakers most frequently ask about frozen foods. It explains clearly several ways of handling and cooking frozen meats, poultry, game, and fish and shellfish.

Fish-Culture in Indonesia, edited by A. E. Hofstede, R. O. Ardiwinata, and F. Botke, Indo-Pacific Fisheries Council Special Publications No. 2, 146 pp., illus., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1953. Contains papers of the seminar on brackish-water fish-culture held in Indonesia from April 11 to May 23, 1951, under the auspices of the Indo-Pacific Fisheries Council. It is divided into three sections. The first section gives an account of the seminar itself and shows the general program of the instruction given by laboratory work, field trips, and lectures. Section two gives an account of the field work of the seminar. This section gives a clear idea of the different types of fish-culture operations in Indonesia. The third section presents the main papers which were given during the seminar, each of which deals with some special aspect of the subject. The first paper in this series gives a brief general account of the inland fisheries of Indonesia, and the next three papers deal with special aspects of brackish-water fish culture. Two other papers deal with special aspects of fresh-water fish culture and, finally, there is a paper on special problems raised by foreign participants.

Foods and Food Processing (Selected Industrial Films), SIF-No. 6, 21 pp., processed, 50 cents. U. S. Department of Commerce, Washington 25, D. C., April 1954. A list and description of films (including certain fishery films) available to business from industrial, commercial, and government sources.

(FOA) Monthly Operations Report (Data as of April 30, 1954), 93 pp., illus., processed, Division of Statistics and Reports, Foreign Operations Administration, Washington 25, D. C. In addition to the usual tables and data, describes the FOA program in Korea.

Informaciones Estadísticas sobre Pesca, 1952, 56 pp., illus., printed. Departamento Técnico-Económico, Dirección General de Pesca y Caza, Valparaíso, Chile, 1954. Presents data on the fisheries of Chile for 1952 by species, areas, and months. Some historical tables and data on utilization, number of fishermen, number of boats, consumption, products produced, whaling statistics, etc. are also included.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

An Investigation of the Effect of Baker Dam on Downstream-Migrant Salmon, by J. A. R. Hamilton and F. J. Andrew, *Bulletin VI*, 78 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1954.

Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 3, no. 1, 290 pp., illus., printed in Japanese with summaries in English. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan, November 1953. Contains among others the following articles: "An Experiment on the Tuna Fishery by Long-Line in the Sea off Mangole and Timor Islands;" "A Study on the Characteristics of the Tuna Long-Line of Kanebian (Vinylon) Twine;" "Study on the Electric Fishing-net--X. About the Fish-Screen by the Three-Phase Electric Shocks;" "Variation in Free-Tyrosine Content of Fish Meat in the Course of Decrease of its Freshness;" "Development of the Principle of Freedom of Fisheries in the High Seas;" and "On the Problems of Continental Shelf Theory in Connection with Fisheries in the High Seas."

"Observations of Pelagic Fishes of the Tropical Atlantic," by Frank J. Mather III and C. Godfrey Day, article, *Copeia*, No. 3, July 29, 1954, pp. 179-188, illus., printed. The American Society of Ichthyologists and Herpetologists, Mt. Royal and Guilford Aves., Baltimore 2, Md.

"The Relation of Total Rainfall of the State and Catch of the Marine Shrimp (*Penaeus setiferus*) in Texas Waters," by Gordon Gunter and Henry H. Hildebrand, article, *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 4, no. 2, June 1954, pp. 95-103, printed. University of Miami Press, Coral Gables, Florida. According to the authors, the catch of white shrimp, *Penaeus setiferus*, along the Texas Coast from 1927 to 1952, inclusive, shows a strong statistical correlation with the total rainfall of the State. The young shrimp grow up in low salinity, estuarine areas and there are some indications that the correlation depends upon salinity per se rather than other factors, such as nutrient salts brought in from land. There is a lag effect in the shrimp catch-rainfall correlation in that the catch is correlated with rainfall of the previous year and the year before that. There are some indications that this may be due in part to a lag in the rise and fall of salinity of bay and offshore waters following wet and dry spells; it may also be due in part to the life history of the shrimp, for part of the population lives over from one year to the next. General inspection indicates that other possible factors influencing the shrimp catch, such as technological improvements, the shrimp price, general price index and economic cycles, are not correlated with the white shrimp catch during this period, whether or not trends are removed. These matters were not statistically analyzed.

"Shad in the Hudson," by G. B. Talbot, article, *The New York State Conservationist*, April-May 1954, pp. 17-19, illus., printed, single copy 25 cents. New York State Conservation Depart-

ment, Albany, N. Y. This article describes the different types of gear used in the shad fishery in the Hudson River. Modern mechanization has not influenced this fishery--the shad fishermen are still using gill nets with hickory poles which are driven into the river bottom, stake nets, drift gill nets, and some haul seines. The author also describes the various research projects which have been conducted to aid the shad fishery. A research project, sponsored by the Atlantic States Marine Fisheries Commission, was begun in 1950 on the Hudson River by the U. S. Fish and Wildlife Service in cooperation with the New Jersey and New York Departments of Conservation to determine methods of increasing and stabilizing the catch. In 1951, with the help of the New York Health Department, a water-quality study was undertaken of the river between Troy dam and the mouth of the river. Coincidentally the New York State Water Pollution Control Board has completed an intensive pollution study of the Hudson River. The author states that "with the aid of scientific research, proper regulation, and conservation measures, it would appear that this old and picturesque fishery can continue to compete with modern civilization and will continue to produce for countless years to come."

The Sponges of the West-Central Pacific, by M. W. de Laubenfels, *Studies in Zoology* No. 7, 332 pp., illus., printed, \$4.00. Oregon State College, Corvallis, Oregon, 1954. An intensive study of the sponges of the West-Central Pacific. The area covered extends from 130° to 180° east longitude and from the equator to 20° north latitude, including four large groups of islands--the Marianas, the Palaus, the (eastern) Carolines, and the Marshalls. Only shallow-water sponges are treated here. A few of the specimens were dredged from Bikini and Eniwetok, but not from very deep water. The discussion is divided into two parts. The first is a description of the Porifera which were studied. The second describes the regions, and the ecological relationships of the sponges. The collections which are discussed aggregate some 183 species. For each species a camera lucida drawing is included as a text figure to provide maximum assistance to nonspecialists. In addition, some 25 species are illustrated by photographs.

"The Surface Current Field in the Western Part of the North Atlantic," by Ilmo Hela, reprint, *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 3, no. 4, February 1954, pp. 241-272, illus., printed. Marine Laboratory, University of Miami, Coral Gables, Fla. By means of the equation of continuity, in the area chosen for this study, the divergence at each quadruple of square degree of latitude and longitude has been computed from the average surface currents, separately for all the four seasons and also for the whole year. On the right-hand side of the axis of the Gulf Stream there seems to be a rather continuous area of divergence. This is shown to be consistent with the vorticity equation.

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FISHERIES OF THE UNITED STATES AND ALASKA, 1952

Fisheries of The United States and Alaska, 1952 (Annual Summary), C. F. S. No. 1050, is a bulletin containing statistics by regions of the number of fishermen, craft, and gear employed in the fisheries of each area; and the catch by species (including fish and shellfish).

Catch of Fishery Products in the United States and Alaska, 1940-52			
Year	Quantity Lbs.	Ex-vessel Value	Avg. Price
		\$	¢ Per Lb.
1952	4,418,442,000	360,135,000	8.15
1951	4,414,045,000	360,996,000	8.18
1950	4,884,909,000	343,876,000	7.04
1949	4,796,000,000	339,000,000	7.06
1948	4,575,000,000	367,000,000	8.02
1947	4,344,000,000	307,600,000	7.08
1946	4,456,000,000	310,000,000	6.96
1945	4,575,500,000	269,900,000	5.90
1944	4,500,000,000	213,000,000	4.73
1943	4,202,000,000	204,000,000	4.85
1942	3,876,524,000	170,338,000	4.39
1941	4,900,000,000	129,000,000	2.63
1940	4,059,524,000	98,957,000	2.44

Surveys covering the 1952 catch of fish and shellfish were made in all areas of the United States and Alaska except the Mississippi River and its tributaries. Data on the operating units were also collected in each of the areas canvassed, except in the Lake States. The most recent operating unit and catch statistics are shown for each section of the country in the tables appearing in the bulletin.

The catch of fishery products in all sections of the United States and Alaska during 1952 totaled approximately 4,418,442,000 pounds, valued at \$360,135,000 ex-vessel (see table). This represented an increase of less than 1 percent in quantity and a decrease of less than 1 percent in value as compared with the landings of the previous year.

Free copies of this publication (C. F. S. No. 1050) are available from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.