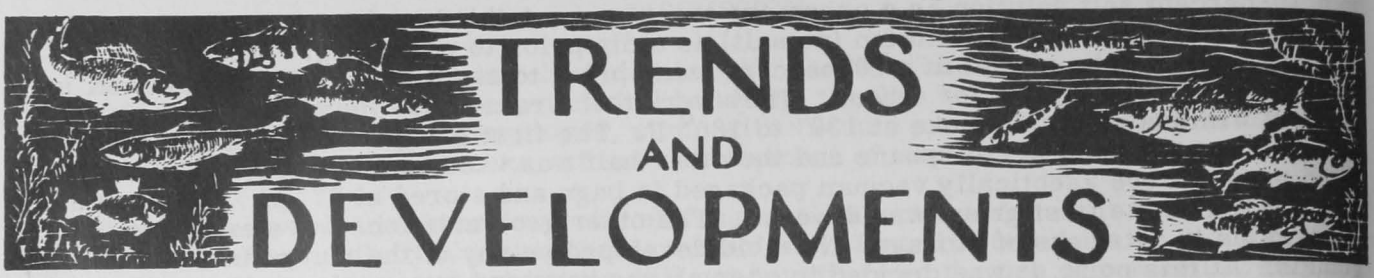


Byproducts

UNITED STATES FISH MEAL AND SOLUBLES SUPPLY AND FISH OIL PRODUCTION, 1959-60:

During 1960 (based on preliminary data), the United States production of fish meal and scrap amounted to 285,000 tons--a drop of 7.0 percent from the 306,551 tons produced in 1959. Imports of fish meal and scrap in 1960 of 131,561 tons were down 1.0 percent from the 132,925 tons imported in the preceding year. The over-all supply (domestic production plus imports) declined about 5.2 percent or 22,915 tons from 1959 to 1960.

Table 1 - United States Supply of Fish Meal and Solubles, 1959-60

Product	1960	1959 2/
	(Short Tons)	
Fish Meal and Scrap:		
Domestic Production:		
Menhaden	218,123	223,893
Tuna and mackerel	1/ 26,000	25,380
Herring, Alaska	6,071	8,094
Other	1/ 34,806	49,184
Total Production	1/285,000	306,551
Imports:		
Canada	30,982	39,033
Peru	68,156	49,923
Chile	21,183	5,104
Angola	888	20,738
Union of South Africa	7,073	9,727
Other countries	3,279	8,400
Total Imports	131,561	132,925
Total Fish Meal Supply	416,561	439,476
Fish Solubles (Wet Weight):		
Domestic Production 3/	99,605	165,359
Imports:		
Canada	869	1,660
Denmark	1,858	18,723
Other countries	447	6,247
Total Imports	3,174	26,630
Total Fish Solubles Supply	102,779	191,989

1/Partly estimated.
2/Revised
3/Includes production of homogenized-condensed fish.

The 1960 production of fish solubles, due to a very poor market for this product, dropped (39.8 percent) sharply to 99,605 tons from the 165,359 tons produced in 1959. The decline in the 1960 imports of fish solubles was even more pronounced--from 26,630 tons in 1959 to 3,174 tons in 1960 or about 88.1 percent.

Table 2 - United States Production of Marine-Animal Oil, 1959-60

Product	1960 1/	1959 2/
	(1,000 U. S. Gallons)	
Menhaden	23,675	20,628
Herring	1,195	1,959
Tuna and mackerel	598	601
Sardine, Pacific	162	188
Other (including whale oil)	1,059	1,569
Total	26,689	24,945

1/Preliminary.
2/Revised.

The United States production of marine-animal oils in 1960 increased 7.0 percent to about 26.7 million gallons from the 24.9 million gallons produced in 1959. The higher production in 1960 was due entirely to an increase in the production of menhaden oil. Although landings of menhaden in 1960 were somewhat lower in 1960 than in 1959, the catches reportedly were made up of larger and fatter fish, resulting in a relatively high oil yield.

Note: Also see Commercial Fisheries Review, March 1960, p. 16.

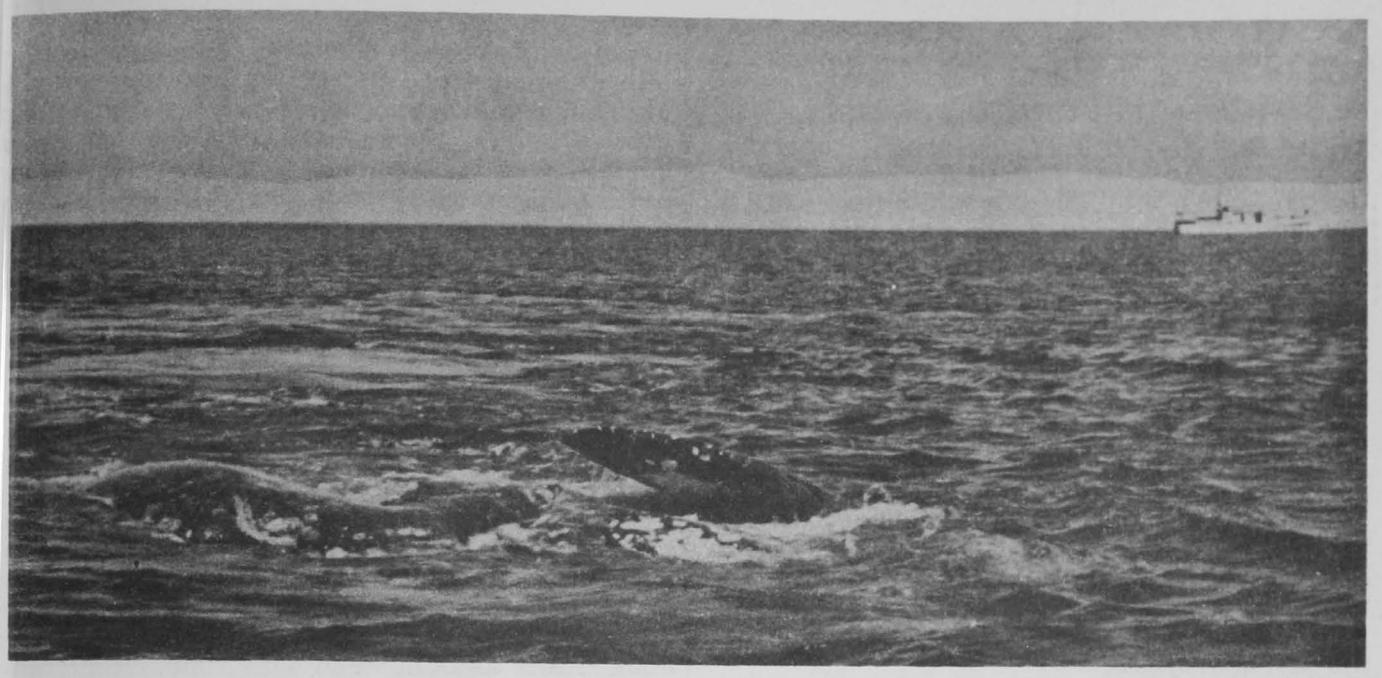
California

PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 61-1-Pelagic Fish: The inshore area from the United States-Mexican Border to Bolinas Bay, Calif., was surveyed from the air (January 16-18, 1961) by the California Department of Fish and Game Cessna "182" 9042T, to determine the distribution and abundance of pelagic fish schools.

Warm, clear weather made it possible to cover the entire survey area, and optimum conditions of visibility prevailed throughout the three-day period.

Only 27 fish schools were seen. All were small and none were found north of Port Hue-



Pair of gray whales rolling and roiling at the surface preparatory to mating off Scammon Lagoon, Baja Calif.

neme. Nine sardine schools were observed five miles southwest of San Clemente City. Eight Pacific mackerel schools were seen two miles off Torrey Pines. Four small anchovy schools were counted one mile off El Segundo, and six more were located one mile west of Port Hueneme.

A total of 117 southbound gray whales was seen. The largest number (40) was observed between Point Piedras Blancas and Point Sur traveling singly and in "pods" of up to nine individuals.

In addition to the gray whales, a group of approximately 50 smaller whales identified as Pacific pilot whales (Globicephala scammoni) was seen two miles west of Point Vicente.

Note: Also see Commercial Fisheries Review, March 1961 p. 22.

* * * * *

SALMON SPAWNING RUN IN CENTRAL VALLEY AREA:

The Sacramento-San Joaquin River systems of California's Central Valleys had another large salmon spawning run during the 1960/61 season, according to estimates of California's Department of Fish and Game.

There were about 485,000 spawners, slightly more than in the 1959/60 run. The record for this decade was 597,000 spawners in 1953.

The Department figures about a half million salmon spawners are needed to maintain the commercial and sports fisheries at a high level. The 1960/61 run closely approaches this and is the largest since 1953. Distribution of the spawning runs differed from last year, Department spokesmen said. The Sacramento River proper and its upper tributaries had a slightly lower salmon spawning population this season than last. On the other hand, the run on the Feather River was larger. The Yuba River population was nearly twice as large as last season and the American River's spawning run was also larger.

Spawner estimates for the Sacramento River system totaled almost 428,000 and for the San Joaquin River system 57,000 for the 1960/61 season.

The spawning survey is made each year, beginning late in September. Information from these surveys helps in drawing up the salmon fishery regulations and will provide information to help evaluate and compensate for water project developments affecting salmon.

Chicago

RECEIPTS OF FRESH AND FROZEN FISHERY PRODUCTS, 1960:

Receipts of fresh and frozen fish and shellfish at Chicago in 1960 amounted to 87 million pounds. The 6-percent drop in quantity from the previous year was not wholly unexpected. The supply trend for certain Great Lakes species during the year showed signs of a decline. On the other hand, receipts from Canada's interior lakes were at a fairly good rate.

Receipts of most of the frozen salt-water species held up well as compared with the previous year. The more pronounced drop in shellfish products receipts was confined to frozen raw headless shrimp and spiny lobster tails. Receipts of other major shellfish items were about the same, or surpassed those of the previous year.

Fresh-water fish receipts of 37 million pounds in 1960 were 6 percent lower than the previous year. Receipts of fresh and frozen whitefish totaled more than 8 million pounds--only slightly less than in 1959. The principal whitefish suppliers were the Provinces of Alberta and Manitoba which combined supplied nearly 7 million pounds of whitefish receipts. Minnesota led all other domestic sources in whitefish supplies for the Chicago market. Receipts of this species from several domestic Great Lakes-producing areas were only about one-half the previous year's volume. The 1960 lake trout receipts from all shippers dropped sharply from the previous year. Supplies of this species marketed at Chicago during the year were much less from both domestic and Canadian shippers.

The year's yellow pike receipts were lower than in 1959 with an almost conspicuous absence of this species from Lake Erie. During 1960, Minnesota shippers provided the Chicago market with more yellow pike than any other source.

A marked drop in the production of yellow perch in most areas of the Great Lakes in 1960 was seen in the year's receipts of this species at Chicago. Yellow perch receipts were down one-third, or one million pounds below the 1959 receipts--a sharper drop in quantity than any other fresh-water species. Wholesale prices for yellow perch at Chicago were fairly low in April-May but advanced steadily during the remainder of the year. Receipts of fresh and frozen yellow perch fillets were cut in half from the previous year. Frozen yellow perch fillets were virtually nonexistent during the last half of 1960 and prices remained high.

Lake herring receipts were the lowest in five years reflecting the production trend of that commercial fishery during the year. The 1960 receipts of buffalofish, catfish, and chubs surpassed those of the previous year. Buffalofish receipts in 1960 set a new record since 1956.

The 1960 fresh and frozen salt-water fish receipts of more than 25 million pounds registered a smaller volume decline than the other classifications. Leading items were frozen halibut, ocean perch fillets, whiting, and salmon. There was an increase in ocean perch fillets, and some gain in flounder, sole, and haddock fillets as compared with 1959. Receipts of frozen cod fillets compared favorably with the previous year, while pollock fillets dropped to an all-time low. Frozen halibut receipts were only slightly lower than in 1959. Volume of dressed halibut was below the previous year but was offset by a substantial increase in receipts of processed halibut such as steaks and portions.

Frozen salmon receipts were lower for all varieties, particularly silver or coho salmon which dropped 30 percent from the previous year. Wholesale salmon prices were high in 1960 and continued to rise throughout most of the year. More iced fresh red snapper was received during the year, and there was a marked increase in receipts of imported frozen red snapper fillets.

Lower frozen raw headless shrimp receipts in 1960 and a nearly one-million-pound decrease in receipts of spiny lobster tails were responsible for a 10-percent decline in the year's shellfish products receipts. Wholesale shrimp prices were mostly steady during the first half of 1960 and gradually dropped in the late summer and fall months, but not to the extent that they dropped in the same period the previous year. Processed shrimp receipts at Chicago continued to climb in 1960 and included more of the peeled and deveined product.

More frozen sea scallops were received in 1960 than the previous two years. Warehouse stocks were heavy during the summer months when prices started sliding. An intensive

promotional program succeeded in clearing surplus stocks. Despite the relative scarcity of oysters at production areas during the year, receipts of shell and shucked stock held up well. Markets in 1960 were firm for practically all varieties of spiny lobster tails. Preferred sizes and some of the more favored varieties were scarce--wholesale prices for this product were even higher than the record 1959 prices.

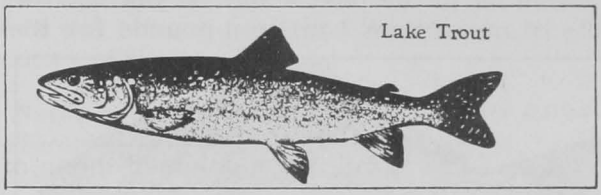
A total of 320 carload shipments of fresh and frozen fishery products was received at Chicago in 1960--a 33-percent drop compared with the 1959 carload deliveries. British Columbia accounted for 163 cars, followed by the Province of Alberta with only 78 cars. Car shipments received from Alberta in 1960 dropped to one-third the 1959 car receivings. The trend toward truck transportation from Alberta was started in 1959 when rail express carload receipts declined in favor of truck hauling. In that year trucks hauled about 10 percent of the total receipts from that Province while

rail express moved 85 percent. The transportation picture on receipts from Alberta in 1960 was sharply reversed with trucks hauling about 60 percent of the year's total receipts while rail express volume dropped to about 25 percent. The remaining 10 percent was made up of frozen fresh-water fish moved by rail freight.

Carload receipts from the State of Washington during 1960 increased 30 percent. Other sources of car shipments were Arizona ports of entry with frozen Mexican west coast shrimp, Saskatchewan, and the Maritime Provinces. A sharp drop in car shipments from Saskatchewan during the year was also due to the more extensive use of trucks. A good part of Saskatchewan-produced fish during 1960 was transshipped to Chicago by truck through Winnipeg dealers.

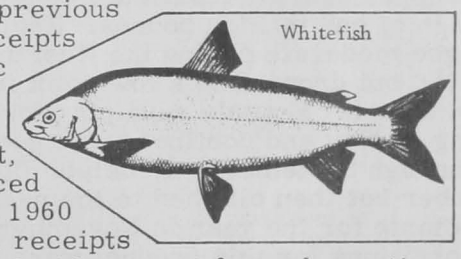
The 1960 receipts at Chicago were at their peak in March when nearly 9 million pounds of fresh and frozen fish and shellfish was received. March was noteworthy for receipts of frozen marine fish and exceptionally good receipts of frozen shrimp and spiny lobster tails. Receipts in March were at a high level for ocean perch and other groundfish fillets, halibut, fish sticks, and whiting. Total monthly receipts fell off in April and May but started to increase with the steady increase in fresh-water fish receipts through September. Receipts were lower in the last two months of the year but did not drop to the 1960 low point of April-May.

Lake Trout: Fresh and frozen lake trout receipts (including fillets) during the year amounted to only 1.6 million pounds. Iced lake trout receipts of slightly more than one million pounds dropped 30 percent from the previous year--28 percent was from domestic Great Lakes production and 72 percent from Cana-



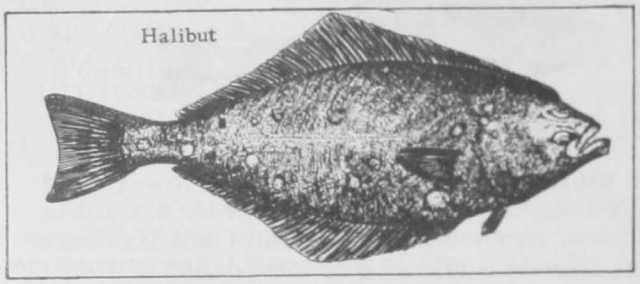
dian shippers. The considerably lower iced fish receipts were partly offset by a sizable increase in receipts of frozen Canadian lake trout fillets, and more frozen dressed fish than in 1959. The bulk of Canadian supplies came from Alberta and Manitoba shippers. Lake trout receipts at Chicago were at a peak during August-September when Canadian fish was dominant. Wholesale prices at Chicago were high throughout the year, and rose to higher levels during the Jewish Holidays than in 1959. Canadian lake trout at various times commanded prices nearly equal to those obtained for domestic fish.

Whitefish: This species continued as the leading fresh-water variety at Chicago in 1960. Canadian fish from the numerous interior lakes again were the mainstay of whitefish supplies for the Chicago wholesale market. Canada shipped more iced whitefish in 1960 than the previous year while receipts from domestic Great Lakes areas dropped 30 percent, the same as iced lake trout. In 1960 iced whitefish receipts consisted of only 10 percent from domestic production and 90 percent from Canada. Receipts of frozen dressed whitefish and whitefish fillets increased modestly from the previous year. Receipts of whitefish were moderate during the first quarter of the year but slumped in April when they were the lowest for the year. Receipts climbed steadily with



the start of Canadian summer-fishing operations reaching a high point in July and September. They dropped sharply from the September high but were at a moderate level in the closing months of the year. Markets were almost consistently strong for Great Lakes whitefish. Prices for the Canadian variety were about the same or higher than in 1959 and did not decline to the lows of some periods during that year.

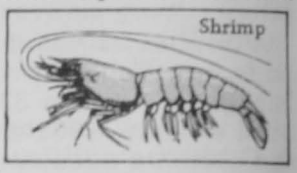
Halibut: Frozen halibut (including fillets, steaks, and portions) stood out as the principal salt-water species received at Chicago, the same as in the past score of years. Receipts of more than 7 million pounds for the



year were about comparable to the 1959 arrivals. Iced fresh halibut for the Chicago market has become past history. The negligible amount received in 1960 was far less than the small quantity marketed during the 1959 season. A trend observed in the frozen halibut market during the year indicated some Chicago distributors did not stock up to the extent of former years. Adequate supplies to fill orders and meet firm commitments were drawn on from West Coast suppliers as occasion demanded thus eliminating local month-to-month storage charges.

Frozen halibut receipts in January 1960 dropped sharply from the December 1959 high of one million pounds. Receipts averaged moderate during the first quarter of 1960 but dropped to a low point for the year in March. Monthly receipts picked up starting in May and continued at a good rate through September. Receipts dipped in October but then climbed to the next highest volume for the year in November. Market conditions for this product were intermittently slow and demand lagged at various times of the year. Frozen halibut wholesale prices at Chicago were lower during a good part of 1960 than the previous year, but advanced to firmer ground toward the end of the year as compared with the same period in 1959.

Shrimp: The 1960 frozen shrimp receipts at Chicago totaled more than 15 million pounds, often approaching a monthly volume of close to 2 million pounds. Receipts were highest in March when nearly one million pounds each of frozen raw headless shrimp and processed shrimp were reported. October receipts were outstanding as the year's largest monthly volume of the raw headless product, but also receipts of breaded shrimp were reported. Processed shrimp receipts at Chicago during the year averaged one-half million pounds a month. The demand for processed shrimp (breaded, peeled, and deveined) continued to increase in 1960 in step with the increase in United States production. (Excerpted from "December 1960 Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends.")



--G. A. Albano, Supv. Mkt. News Reporter, Fishery Market News Service, Chicago, Ill.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, 1956-60:

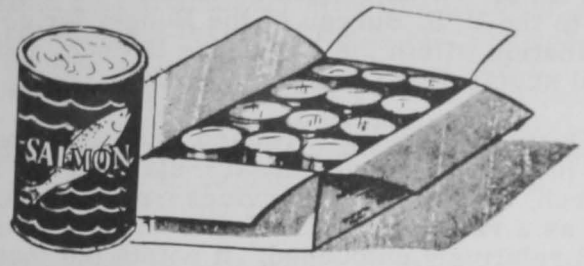
Fresh and Frozen: In 1960 purchases of fresh and frozen fishery products by the Military Subsistence Supply Agency for the use of the Armed Forces amounted to 22.9 million pounds, valued at $11.8 million. This was 1.2 percent more in quantity and about 1.8 percent more in value as compared with 1959. Prices paid for fresh and frozen fishery products in 1960 by the Agency averaged 51.7 cents a pound, 0.4 cent a pound more than the 1959 average of 51.3 cents a pound. For the 5-year period 1956-60, purchases varied between a high of 26.6 million pounds in 1956 to a low of 22.5 million pounds in 1958. Average prices per pound varied from a low of

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, 1956-60

1960		1959		1958		1957		1956	
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000
22,917	11,839	22,651	11,624	22,511	12,850	23,452	12,080	26,610	13,413

50.4 cents a pound in 1956 to a high of 57.1 cents a pound in 1958. The annual yearly average price per pound in 1957, 1959, and 1960 varied less than one cent a pound.

Canned: Purchases of canned fishery products in 1960 rose sharply from the preceding year due to an increase in the purchases of canned salmon, principally because



more was packed in that year. Canned salmon purchases jumped 231.2 percent, or from 1.1 million pounds in 1959 to 3.6 million pounds in 1960. Purchases of canned tuna (3.6 million pounds) in 1960 were about unchanged from the 3.7 million pounds bought in 1959. Canned sardine purchases of 147,000 pounds in 1960 were much lower than the million pounds or more purchased in the preceding year. However, canned sardine purchases in 1959 were abnormally high due to the experimental purchase of California sardines. There was a good pack of California sardines in 1959, but in 1960 the pack was small. In 1960 purchases of both canned salmon and sardines followed the normal pattern established over the past five years.

Note: Also see Commercial Fisheries Review, April 1960 p. 22.

* * * * *

DEPARTMENT OF DEFENSE PURCHASES, JANUARY 1961:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, 1.9 million pounds of fresh and frozen fishery products were purchased in January 1961 by the Military Subsistence Supply Agency. This exceeded the quantity purchased in December 1960 by 8.9 percent and was 24.0 percent higher than the amount purchased in January 1960. The value of the purchases in January 1961 was up 11.2 percent as compared with December 1960 and 25.5 percent above the value of the purchases made in January 1960.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, January 1961 with Comparisons

QUANTITY			VALUE		
January		Jan.-Dec.	January		Jan.-Dec.
1961	1960	1960	1961	1960	1960
(1,000 Lbs.)			($1,000)		
1,856	1,497	22,917	925	737	11,839

Prices paid for fresh and frozen fishery products by the Department of Defense in January 1960 averaged 49.8 cents a pound, 1.0 cent above the 48.8 cents paid in December 1960 and 0.6 cents more than the 49.2 cents paid in January a year ago.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, 1956-60

Product	1960		1959		1958 1/	1957 1/	1956 1/
	Quantity	Value	Quantity	Value	Quantity		
	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	(1,000 Lbs.)		
Tuna	3,610	1,613	3,698	1,672	5,884	2,711	3,334
Salmon	3,593	2,436	1,085	737	3,336	3,111	2,798
Sardines	147	61	1,051	177	253	215	236
Total	7,350	4,110	5,834	2,586	9,473	6,037	6,368

1/ Value unavailable.

Canned: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during January this year.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, January 1961 with Comparisons

Product	QUANTITY			VALUE		
	January		Jan.-Dec.	January		Jan.-Dec.
	1961	1960	1960	1961	1960	1960
	(1,000 Lbs.)			($1,000)		
Tuna	1,002	451	3,610	442	191	1,613
Salmon	-	-	3,593	-	-	2,436
Sardine	21	6	147	11	4	61

Purchases of canned tuna in January 1961 were 122 percent greater than in January a year earlier.

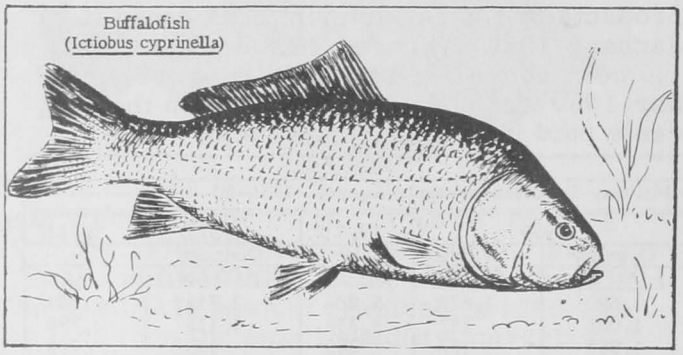
Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

Fish-Farming

PRODUCT-DEVELOPMENT WORK AIDS ARKANSAS FISH FARMERS:

Product-development work involving buffalofish was included among the technological activities of the U. S. Bureau of Commercial Fisheries the latter part of 1960. These fish are being harvested from flooded rice fields and impoundment areas of Arkansas. Large quantities currently are being produced, and the potential possibilities for even greater production are good.

Utilization of this species has been limited, due to the presence of a large number of "floating bones" in the back portion of the fish. Through experimental studies technol-



Buffalofish
(Ictiobus cyprinella)

ogists have discovered that the bone problem is considerably alleviated by scoring of the fillets. The fillet yield is high for small buffalofish (50 to 60 percent) and the general texture, flavor, and appearance is very acceptable.

More recent studies have been conducted to investigate the acceptability of buffalofish in forms other than fresh or frozen fillets. It was found that smoked buffalofish fillets are very acceptable and many of the local producers are now considering the commercial production of this product.

Fish and Wildlife Service

LONG-RANGE REPORTS ISSUED:

Measures for protecting fish and wildlife resources and ways to strengthen and preserve the Nation's vast food-fishery resources, are outlined in two long-range reports issued January 20, 1961, by Secretary of the Interior Fred A. Seaton.

The two reports are: Operation Trident by the Fish and Wildlife's Bureau of Commercial Fisheries, and Conservation in Action, A Pledge for the Future by the Bureau of Sport Fisheries and Wildlife. The reports were previously distributed for comment to the Governors of the 50 States, and to conservationists and conservation organizations. Both reports have been substantially revised since that time. These reports must now be submitted to the U. S. Bureau of the Budget for coordination within the Executive Branch, and final submission to the Congress.

Operation Trident: Named from Neptune and his three-pronged spear--standing for research, development, services--pictures the sea as a vast reservoir of natural resources still relatively untouched. It points out that

although it is only about seven miles from the surface of the water to the deepest part of the sea, we know less about this real world so near than we do about the cold reaches of outer space. It also calls attention to the growing importance of fisheries in world affairs and urges that the United States strengthen its position of leadership in international fisheries. The long-range program of the Bureau of Commercial Fisheries is designed to help narrow this gap in knowledge and thus aid the national economy and the national defense.

The report shows how proper financial planning and adequate financial support can

bring quick results of permanent benefit to the Nation and provide valuable basic knowledge to improve and reduce the costs of harvesting, processing, and marketing of fish.

It cites accomplishments that point the way to the eradication of the sea lamprey in the Great Lakes; rehabilitation of the shad runs on the Atlantic Coast; increased medical research on the use of fish oils recently found to be particularly effective in lowering the cholesterol levels of the blood; increased knowledge of the circulation of the ocean through a recent discovery of a major ocean current in the Pacific; development of air-bubble curtains to guide and capture fish; and discovery of valuable new fishery resources and fishing grounds.

Conservation in Action: A Pledge for the Future details the fish and wildlife areas in which the Federal Government has management responsibilities, and emphasizes the part the Bureau of Sport Fisheries and Wildlife can play in research on the problems which must be solved if the Government, the States, and other land holders are to manage their wildlife resources at optimum levels. It stresses phases of the work which extend beyond state boundaries. The report stresses programs which it says are of such urgency that immediate action is needed. Topping the list is wetlands preservation and saving choice marshes for wildlife while there is still time.

Also cited are: Bringing the National Wildlife Refuges up to maximum capacity; intensive waterfowl production, making two ducks grow where only one grows now; species management of waterfowl; protecting birds in trouble and hunting those in adequate supply; mourning dove management, so this popular game bird in 30 States and a song bird in the others can continue to exist in satisfactory numbers; protection of endangered species; research on pesticides to learn how to protect farm crops without endangering fish and wildlife resources; control of depredations by wildlife to facilitate reforestation and aid agriculture; research on reservoirs to make them real fishing havens; studies on marine sport fisheries to keep pace with their increasing popularity; selective control of fish populations by chemical, mechanical or electrical methods to protect wanted species of fish from the inroads of undesirable species; and an educational program to acquaint the public with problems and progress.

The report emphasizes that most of the hunting and fishing now is, and in the future will be, on private lands and that through research these lands can be made to support wildlife as well as agriculture and forests.

To begin the acquisition of wetlands at a rate fast enough to be worthwhile, the Bureau of Sport Fisheries and Wildlife report proposes that Congress establish a Federal revolving fund of $150 million dollars, to be repaid by duck stamp revenue. It recommends also that the Government make $100 million available to the States on a 30-year basis for the purchase of wetlands.

Freezing

FIRST LIQUID NITROGEN FREEZER ADAPTED TO PRODUCTION LINE:

A New York firm has developed a machine which freezes packages of food to temperatures of -320° F. for ultra-quick freezing. The machine, which uses liquid nitrogen for freezing, has been designed to fit into the last phase of a packer's production line. It requires only 128 square feet of floor space and has a capacity of 120 packages per minute. Packages of prepared foods in wire baskets come off the production line at 160° F. to 180° F., and on to a conveyor which conveys them through a gentle shower of liquid nitrogen. After the shower the packages are immersed in a pool of liquid nitrogen at -320° F, the immersion time being regulated to the size, type, and shape of the package. A reliquefier machine is connected to the unit so that nigrogen may be used many times thus reducing the over-all operating costs. The amount of nitrogen loss may range from 5 to 10 percent.

The process can be extended to the trucker who can make use of the firm's new insulation insert designed to utilize liquid nitrogen. It is stated that the process is competitive with the standard methods of refrigeration used in transportation. (Quick Frozen Foods, June 1960, pp. 31, 157, and 158.)

Gulf Exploratory Fishery Program

COMPARATIVE STUDIES OF STANDARD AND EXPERIMENTAL TRAWL ASSEMBLIES MADE BY "GEORGE M. BOWERS:"

Cruise 32: The U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers completed Cruise 32 February 17, 1961. During the first half of the cruise (11/28 - 12/17/60) operations were conducted in the Panama City area and during the second half (1/17 - 2/17/61) in the Eleuthra, Bahamas, region.

The George M. Bowers crew engaged in shrimp-trawl-door mechanics investigations.

Instrumentation and methods for measuring directly significant mechanical parameters of shrimp gear were designed and tested. These included a trawl-door angle-of-attack indicator, a door-net leg-angle indicator, a trawl-and-door-spread indicator, and a towing-warp-angle indicator. These instruments and others will be used in future shrimp-trawl mechanics investigations. Preliminary testing indicates the configuration of a given shrimp trawl assembly varies widely dependent upon speed, scope ratio, and flotation. Movies of a 40-foot balloon trawl on 6 by $2\frac{1}{2}$-foot doors at various speeds and scope ratios were obtained.

Four designs of 5-foot model midwater trawls were constructed and comparative towing tests conducted to evaluate the comparative efficiency of each. No attempt has been made to achieve hydrodynamic similarity between the models and full-scale trawls. The sole objective is to compare various 5-foot designs. A model patterned after the British Columbia midwater trawl was used as a standard and three experimental designs tested against it. The experimental designs included a pyramidal shape and two conical shapes. These trawls were designed as frame works of given dimensions and the webbing hung to fit the frames. This hanging technique is in contrast to the standard method where the trawl is hung to the headrope, footrope, and breastlines and permitted to assume its own position longitudinally. The mesh configuration chosen for these initial experiments was a square (hung in 70.7 percent of stretched measure in both directions) since approximately 15 percent less webbing is required to cover a given area with this shape than with the 50 percent lateral, 86.6 percent longitudinal configuration.

The lateral and vertical deflecting forces were obtained using spreaders at each corner of the trawl. The standard method of doors, floats, and weight or depressors was abandoned because flotation devices large enough to be effective produced drag out of proportion to the total drag of the model assembly. The corner spreaders functioned well, were easy to handle, and permitted sharp turns while towing without fouling the gear. Also, since the resultant force of the spreaders was at a diagonal to both the horizontal and the vertical planes, flotation and depressing devices with their attendant drag and inconvenience were not required.

Observations of the standard and pyramidal nets indicated two significant features: that the body of the trawl tended to assume a conical shape and that the hanging lines (headrope, footrope, and breastlines) tended to tow in a direction parallel to the towing direction rather than at an angle to it as they were designed to do. Consequently, a conical design was constructed with the headrope, footrope, and breastlines cut as hyperbolic sections of the cone (parallel to the direction of tow).

Measurements of the gear indicate the experimental designs tow with less drag than the standard particularly at higher speeds and that the conical design required less force to open than either the standard or pyramidal designs. Also, the magnitude of load in the bag had little effect on the spread over the speed range tested (0.9 to 2.9 knots).

The performance of the standard, pyrmidal, and conical nets at various speeds

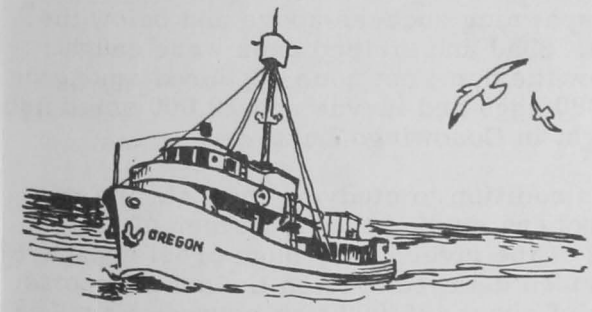
with various loads in the bag were recorded on 1,000 feet of movie film.

A sea sled to vessel communication system was designed and constructed. The system functioned well permitting accurate longitudinal positioning of the sled and change of water speed and scope ratio without surfacing. The ability to communicate from underwater to the towing vessel increases effectiveness of observation, photography, and measurement from the sled many times. It also offers a greater degree of safety in that the vessel can be signaled immediately in the event of mishap.

* * * * *

EXPERIMENTAL MIDWATER TRAWLS TESTED AND COMPARED WITH BRITISH COLUMBIA-TYPE MIDWATER TRAWL:

M/V "Oregon" Cruise 73: Tests of two experimental midwater trawl designs and the comparative performance of the British-Columbia-type midwater trawl were made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel during a cruise that ended on February 10, 1961. The work was carried out intermittently (January 11-15, January 26-29, February 1-3, February 8-10) in the 20- to 50-fathom area east of the Mississippi Delta.



On a total of 25 midwater trawling stations, correlations were made between vessel speed, vertical net movement, spread, and warp length, using the electric telemeter and pitometer log. Comparative data on 3 different types of trawl doors was also obtained.

This work only partially completes the tests on the new-type gear. However, there is strong evidence that one of the designs will permit an increase of towing speed of over 100 percent without sacrificing any of the required net spread.

The 50-foot-square nets used during the cruise have been disassembled and are being reconstructed with different tapers and increased size for further testing on cruise 74.

Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, FIRST QUARTER 1961:

Civilians consumed somewhat less fishery products per person in the United States last year than in 1959. Prospects are that the rate for the next few months will continue no higher than a year earlier. Retail prices of these foods in 1960 averaged about the same as in 1959, with the level lower in early 1960 and higher during the remainder of the year as supplies became relatively less plentiful than a year earlier.

The catch of food fish and shellfish in 1960 was slightly higher than in 1959. The increase in landings of species used mainly in the canned form was almost offset by reductions for those marketed as fresh or frozen products. The pack of canned tuna was record large and canned pack increases over 1959 also occurred for mackerel, salmon, and Maine sardines. However, the packs of the last two items each were low in 1959. Imports of fresh and processed fishery products in 1960 were well below those of a year earlier because of reduced supplies in countries which are important exporters.

Supplies of edible fishery products into early spring 1961 are expected to remain somewhat below those of a year earlier. Stocks of the processed items were a little lower at the beginning of this year than last, and the commercial catch of fish and shellfish will remain seasonally low for the next month or so. Imports of fishery products may be no larger than in early 1960. Retail prices of fishery products into early spring

are expected to continue noticeably above a year earlier.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 24, 1961, release of the National Food Situation (NFS-95).

Maryland

STUDY CONCLUDES THAT FISHWAY AT CONOWINGO DAM WOULD HAVE LITTLE VALUE:

The construction of a fishway over Conowingo Dam in the lower Susquehanna River might benefit eels and eel-fishermen, but would probably produce no appreciable gains to other important fish (shad, striped bass, catfish, etc.) or their fisheries. These are the principal conclusions of a five-man fishery Advisory Committee which supervised the recently completed three-year Susquehanna Fishery Study.

The chairman of the Advisory Committee and Director, Maryland Department of Research and Education, announced these conclusions on February 21, 1961, with the publication of the 81-page final printed report entitled, The Susquehanna Fishery Study, 1957-60: A Report of a Study on the Desirability and Feasibility of Passing Fish at Conowingo Dam. The report was jointly issued by the Maryland Department and the electric company which operates the dam at Conowingo, Md. It contains the recommendations of the Advisory Committee and the results of intensive research on fish and fishing below and at the Conowingo Dam and in the reservoir up the river to the next dam at Holtwood, Pa. The report is being sent to the members of the Chesapeake Bay and Tributaries Committee of the Maryland House of Delegates and to other pertinent legislators and conservationists.

The study was designed to answer the question, "If fish could pass this dam, would there be increased production of young fish, more adult fish, and better fishing?"

Conowingo Dam is the first of three substantial dams which would be encountered by fish moving upstream. Others are at Holtwood and Safe Harbor, Pa. Conowingo was completed in 1928, and two fishways were designed for installation. However, on advice of what is now the U. S. Bureau of Commercial Fisheries that they probably would not pass fish, they were never constructed, and the power company pays $11,000 each year to Maryland and Pennsylvania for use in improving fishing in the river. When Maryland considered legislation to require the installation of fishways in 1955, a legislative committee agreed with the power company that there was insufficient knowledge for fair decision on the problem, and the owners of the dam agreed to provide support for this thorough study.

A wide variety of research tools was brought to bear on the problem. A historical study showed that the average annual value of fish caught commercially in the upper river between 1887 and 1908, before the dams were built, was $45,000. At present prices, the best catch would be worth about $85,000 and the minimum worth $20,000. Field studies included planting 6,729 shad, 4,022 striped bass, 1,123 glut herring, and 166 catfish above the dam, and most of the fish were tagged to trace their movements. Other "control" fish were released below the dam. Nets, seines, and trawls were used for three years to check for spawning success above and below the dam. Shad and striped bass were caught below the dam, but none appeared among the 23,000 eggs and larvae and 19,000 small fish caught in Conowingo Lake.

In addition to studying the fish, the researchers studied the fishermen of this part of the river. Thorough creel census provided detailed data on the annual sports take of about 425,000 fish between Havre de Grace and Holtwood Dam. Catfish are kings in these waters, but there is one migrant from the ocean which appears to survive and grow in the river--the eel. Large numbers of young elvers, which hatch only in the ocean, annually reach Conowingo. Pennsylvania fishermen feel that fresh-water eels are far superior to those that remain in brackish water and would like to have more available.

For the other fish, intensive study yielded no evidence that they would successfully spawn in the reservoir or that they would establish a new fishery above the dam. No eggs or larvae were found, except for a

single herring fry, and very few of the planted fish were caught in the reservoir while rather large numbers were successful in going back down the river through or over the dam.

Simultaneous physical and chemical studies of Conowingo Lake by the Chesapeake Bay Institute showed that there is little quiet water present during the normal high spring flows that occur during spawning season; that water moves through the reservoir in about 24 hours; that shad and striped bass eggs would probably be carried out of the lake before they hatch; that most of the water deeper than 40 feet contains too little oxygen during the summer to support fish; and that the Lake drops a heavy silt load unfavorable to any eggs which reach the bottom.

The report also contains detailed statements on the movements of fish, the kinds of young and larval fish present in the upper Chesapeake area, and many other data which add substantially to present knowledge of fish and fishing.

The Chairman of the Advisory Committee commented on the geographic scope of the study: "Most of this research was limited to the Conowingo region and to the effects of passing fish only at that dam. The Committee feels that the study provides a strong basis for reasonable decisions in that region. The findings may also apply to the next dam at Holtwood and to its reservoir. Above that reservoir, river conditions are somewhat different."

Massachusetts

FROZEN FOOD CODE EFFECTIVE IN FEBRUARY:

The Massachusetts version of the model code for the frozen food industry as developed by the Association of Food and Drug Officials of the United States (AFDOUS) went into effect on February 1, 1961.

According to the director of the Department of Public Health's State Division of Food and Drugs, "There is 80 percent compliance already with the provisions of the State code." The remaining 20 percent, he explained, is not opposed to the State code, but is having difficulty in getting delivery of new equipment to comply with it.

Originally, the State code was to go into effect August 1, 1960, but the effective date was postponed.

The main objective in the Massachusetts code is to maintain frozen foods (including fishery products) at 0° F. from processor to consumer. Under the State code a warehouse can accept frozen food that is up to 10° F. if the air temperature in the warehouse does not go above 0° F. If, however, the temperature of the frozen food is above 10° F., the warehouse can accept it, but the frozen food may not be removed from the warehouse until the owner of the frozen food notifies the Public Health Department.

The Massachusetts version of the AFDOUS code differs from the model code in several major areas. One of the differences is that in the Massachusetts code, "thawed-out" commodities, such as chicken, turkey, and fish do not have to be maintained at 0° F. from start to finish, as in the model code. These "short-term" frozen foods, which must be frozen at 0° F. in the warehouse, can be kept at the regular 40° F. temperature in the display case or by restaurants and other institutional outfits for use during holidays and meatless days. The AFDOUS code does not differentiate between regular frozen food and "thawed-out" commodities. (Food Field Reporter, January 30, 1961.)

Michigan

COMMERCIAL FISH LANDINGS INCREASE SLIGHTLY IN 1960:

As in other Great Lakes states, the plight of the commercial fishing industry is serious in Michigan. This is shown in part by Michigan's roster of licensed commercial fishermen which last year dropped to 997, barely above the all-time low of 1957.

The commercial fishermen landed slightly more than 23 million pounds of fish from the Great Lakes in 1960, an increase of about 750,000 pounds from 1959. Although the commercial fish catch was up somewhat in 1960, quality was down, a trend which started several years ago.

Lake trout production was below 300,000 pounds. This is less than half of the 1959

yield and 5 percent of the lake trout poundage for 1941, best of the last 20 years. Whitefish landings rose about 130,000 pounds in 1960, but were 93 percent below the record year for whitefish.

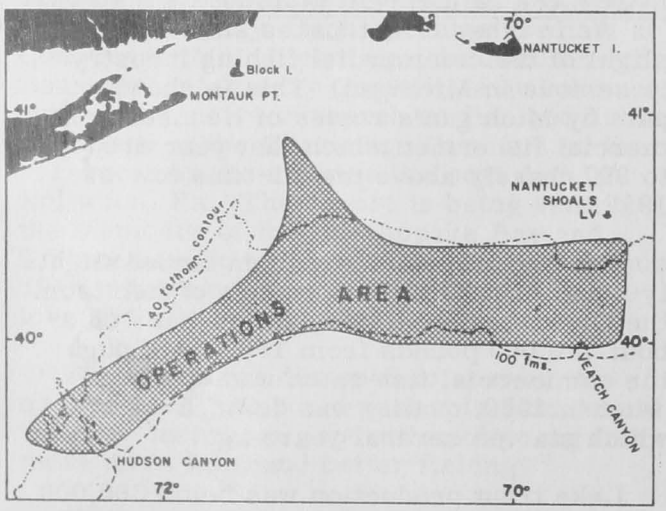
Pickerel and herring landings were down considerably while catches of chubs and perch apparently reached a new high. Introduction of trawling in southern Lake Michigan yielded about 1.5 million pounds of fish; all but 125,000 pounds went for industrial uses, mostly animal food.

Value of the 1960 landings is estimated at $2,750,000. In 1948, one of the State's banner years, commercial fishermen took over 30 million pounds, valued at $5 million.

North Atlantic Fisheries Exploration and Gear Research

SURVEY OF MIDWATER FISH STOCKS INITIATED:

M/V "Delaware" Cruise 61-1: The first in a series of cruises devoted to studying the waters of the Northwestern Atlantic for concentrations of midwater resources was completed by the U. S. Bureau of Commercial Fisheries research vessel Delaware on February 2, 1961. Operations extended over an 11-day period.



M/V Delaware Cruise 61-1 (Jan. 23-Feb. 2, 1961).

Sonic equipment capable of scanning a zone up to 2,000 yards ahead and/or to either side of the vessel was employed in conjunction with a sensitive depth-recording indicator. The principal area of operations was along the "edge" of the Continental Shelf between the Nantucket Lightship and the Hudson Canyon; depths worked included those between the 40- and 125-fathom contours.

In addition to surveying the area with electronic fish-finding equipment, some fishing was completed with both bottom and "midwater" trawls.

A standard No. 41 otter trawl was employed to determine the composition of species present on the bottom. Over 15 commercially-important species were recorded from 10 locations. Included, and of particular interest, were captures of Boston mackerel (Scomber scombrus), American shad (Alosa sapidissima), and haddock (Melanogrammus aeglefinus).

At eight locations, experimental midwater trawls were fished--catches with this gear were not in commercial quantities. However, the following species were represented by small catches: hake (Merluccius sp.); butterfish (Poronotus triacanthus); scup (Stenotomus chrysops); spiny dogfish (Squalus acanthias); and Boston mackerel (Scomber scombrus).

Bathythermograph and other hydrographic data were taken. Surface drift bottles were released, in cooperation with the Woods Hole Oceanographic Institution, at approximately 10-mile intervals along the vessel's track.

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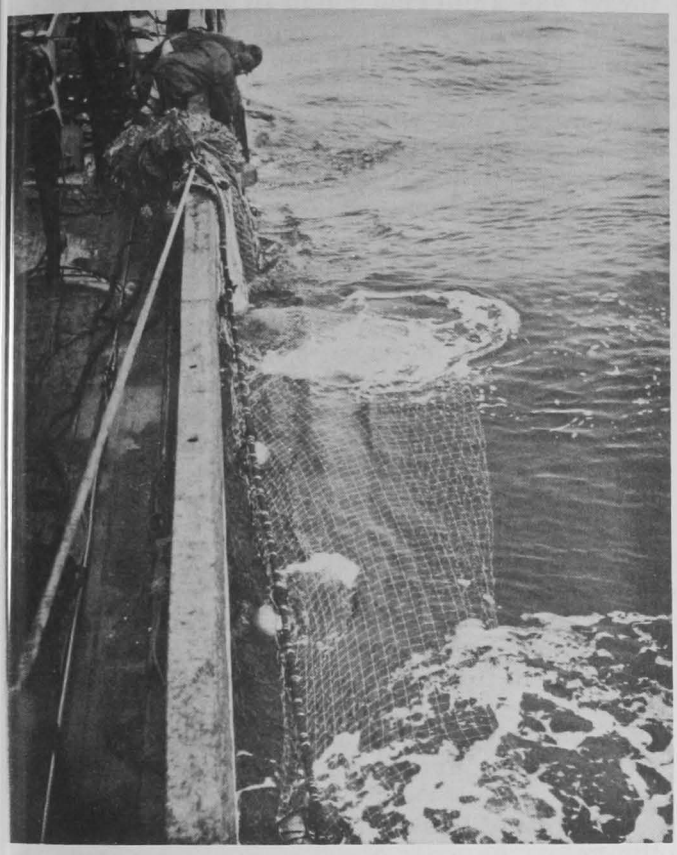
STANDARD MANILA OTTER TRAWL COMPARED WITH EXPERIMENTAL TRAWL CONTAINING POLYPROPYLENE PARTS:

M/V "Delaware" Cruise 61-2: Comparison tows were conducted by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware February 7-15, 1961, using two No. 41 otter trawls, one a standard net constructed of manila twine and the other a similar net constructed to No. 41 dimensions but with the top wings, top belly, square, and some ropes made of polypropylene (similar to polyethylene) twine. The purpose of this cruise was to determine whether or not a trawl constructed partially of this synthetic fiber material would result in increased fishing efficiency.



Otter trawl with polypropylene sections. Note floating twine.

A total of 86 1-hour tows was made on the southeast part of Georges Bank and on Tobins Bank. An odometer was attached to the cod-end of each trawl to determine the over-the-ground distance covered by the trawls.

Length measurements were taken of all individuals of commercial species of fish caught to determine the quantity and composition of the catch and to obtain data for determination of fish escapement through 5-inch polypropylene netting as compared to 5-inch manila netting. Internal, wet, after-use measurements were taken on the top sections of both trawls.

Examination of the trawl data indicated (1) a slight increase in the distance covered by the trawl containing polypropylene material and (2) a somewhat higher catch-rate for the experimental net. The polypropylene quarter ropes and bullrope used with it were found to ease the handling of the net due to their pliability and their light weight which allows them to float on the water. (Polypropylene ropes and twine are stronger for comparable size, yet lighter than manila and do not lose strength when wet.) After-use measurement of the meshes found the manila netting to average 4.47 inches as compared to 5.05 inches for the polypropylene.

Net sections similar to those tested have been supplied three commercial fishing vessel captains for trial use. A captain who has used a polypropylene belly section for two trips reports that he believes the altered net fishes better. No report has been received to date from the others. Further testing of the synthetic netting is planned to more closely define its merits as compared to standard manila twines. Additional reports will be circulated reporting future testing aboard the M/V Delaware and commercial fishing vessels.

Bathythermograph data was taken and drift bottles were released in cooperation with the Woods Hole Oceanographic Institution.

North Atlantic Fisheries Investigations

BIDS REQUESTED FOR NEW FISHERY RESEARCH VESSEL:

The U. S. Bureau of Commercial Fisheries has asked for bids to construct a new research vessel to replace the Albatross III which was deactivated in February 1959.

The Bureau has invited shipyards to bid on the construction of a welded steel vessel as designed by a Boston, Mass., naval architect. The design includes dimensions of 187 feet over-all, 33-foot beam, 1,000 tons displacement, a speed of 12 knots, and a range of 9,000 miles.

The new research vessel will make possible urgently needed investigations of the factors that affect the distribution and abundance of commercially-important species in the Northwest Atlantic.

North Pacific Exploratory Fishery Program

SINGLE-VESSEL PELAGIC TRAWL IS OBJECTIVE OF M/V "JOHN N. COBB" RESEARCH:

Cruise 49: The U. S. Bureau of Commercial Fisheries exploratory fishing

vessel John N. Cobb departed on February 13, 1961, for 8 weeks of gear development work in cooperation with the Washington Department of Fisheries and the Bureau's Pacific Salmon Investigations. Members of the research staffs of the cooperating agencies were aboard during a part of the cruise. Master divers from the U. S. Naval Torpedo Station at Keyport, Wash., also were aboard to assist in underwater observation of surface and midwater trawl gear. The vessel was due to return from the area of operations (San Juan Islands, Georgia Straits, and off Cape Flattery) on April 7, 1961.

The primary purpose of the cruise was the development of a large, single-boat pelagic trawl which can be used on the surface or in midwater. Secondary objectives of the cruise include:

1.- Testing of newly-designed hydrofoil doors to determine their effectiveness in opening a large, small-mesh herring midwater trawl.

2.- Testing and use of 1-inch spherical omni-directional acoustic transducers to measure trawl performance variables.

3.- Testing the performance of a new type electrical trawl cable.

4.- Determination of the relationship of net opening to the amount of "hang-in" of meshes attached to rib lines.

A recently-constructed "surface trawl" was observed by divers to determine needed modifications. Data on trawl performance was obtained by electronic indicators, diver observation, and comparative fishing tests.

Oceanography

SCRIPPS INSTITUTION OF OCEANOGRAPHY INVESTIGATIONS IN SOUTHEAST PACIFIC:

The vessel Horizon of the University of California's Scripps Institution of Oceanography returned to San Diego at the end of December 1960 from a three-months expedition off Peru and northern Chile. Aims of the expedition were to determine whether an east-flowing surface current south of the Equator actually existed, as predicted by theory and previous sparse data; whether there was a current running beneath the north-flowing Peru Current and in the opposite direction; whether the north-flowing Peru Current arises in the Antarctic or farther north; and what happens to the water in the narrow, swift Cromwell Current, which flows east beneath the Equator, after it passes the Galapagos Islands.

South Equatorial Countercurrent: Several months ago Joseph L. Reid, Jr., Scripps Institution of Oceanography, published a paper predicting that between 5 and 10 degrees south of the Equator there would be found an eastward-flowing current that is the mirror image of the North Equatorial Countercurrent. The expedition charted this current. It is a flow about 300 miles wide, not as strong as that in the north, but powerful enough to drive the ship well to the east of her course.

Undercurrent off Peru: The cool, rich, northward-flowing waters of the Peru Current were found to be underlain by another current at depth running south. The existence of this current had also been predicted.

Source of Peru Current: During most of the year, the west coast of South America is bathed by cool, north-flowing currents. It has been assumed that these form a single current several thousand miles long. The expedition found that there are two current systems, one off Chile, one off Peru. Between the two in northern Chile there is a patch of relatively warm water which is the site of rich tuna catches. The Chilean Current turns westward to sea, and the Peru Current comes into being well north of the turn.

Cromwell Current: Efforts to trace the Cromwell Current east of the Galapagos Islands were not successful. (Pacific Science Association Information Bulletin, January 1961.)

Oregon

BIDS INVITED ON NEW TYPE FISHWAY:

Something different in the way of fish passage structures is being planned by the Oregon Fish Commission for Lookingglass Creek, a tributary of the Grande Ronde River in Union County.

Lookingglass Falls, a cascade-type flow rather than a sheer drop, is the scene of fish passage difficulties. During favorable high-water conditions steelhead and salmon are able to negotiate the falls. Frequently, however, water conditions are such that anadromous fish are barred from several miles of prime upstream spawning area.

The new fishway, known as the Denil (Deneel') type, will feature baffles so arranged that water currents will flush leaves, twigs, and other debris through without allowing them to accumulate. This will greatly reduce the amount of maintenance necessary to keep the facility at peak operating efficiency. This feature makes the Denil-type structure most suitable for isolated locales where it is not practical to have an attendant present at all times. The Lookingglass structure will be the second of its type in Oregon. The first is being constructed at the outlet of Suttle Lake by the U. S. Forest Service on the recommendation of the Fish Commission.

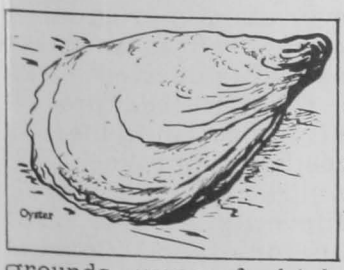
Steeper than most fish "ladders," the structure has a 1 on 6 slope, meaning that there is a 1-foot rise in elevation for each 6 feet of length. Turbulent water flow is a major factor in the self-cleaning feature. Fish are able to negotiate the current with ease, even with flows up to 30 cubic feet per second.

The fishway will be built of reinforced concrete and measure 6 feet deep, from 4 to 6 feet in width, and 60 feet long.

Oysters

ALABAMA OPENS NEW AREAS FOR OYSTER FARMING:

To encourage more oyster production, Alabama Seafood Division authorities stated early in 1961 that all waters of Mobile Bay in Baldwin County south of Point Clear, except areas reserved for State oyster reefs and seed beds, have been opened for leasing. These are barren grounds, some of which are suitable for oyster culture, but are not now producing.



Alabama had an excellent production year in 1959/60, but the supply has been somewhat lower this year according to local sources, probably from losses from the hurricanes which hit there the fall of 1960.

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LONG ISLAND SOUND GROWERS PLAGUED BY STARFISH ABUNDANCE:

Starfish were 85 percent more abundant in Long Island Sound in the fall of 1960 than they were in the fall of 1959, according to a survey of the Connecticut Shellfish Commission. The great bulk of the starfish collected were from 2-5 inches in diameter. The great increase in the number of starfish was probably due to two factors: (1) while the intensity of the set was not too heavy, a high percentage of the set survived and grew. This survival may have been partly the result of a heavy set of the coot clam which is an important food item of the starfish; (2) the increase probably was due to the movement of masses of starfish from deeper waters where oysters are grown.

Starfish

No matter what the causes, Long Island growers are still beset with this plague which has been so destructive to their seed stock since 1955. Concentrated efforts are being made to fight these infestations using mops and dredges.

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PRODUCTION IN TEXAS EXPECTED TO DROP DUE TO FLOODS:

After a bumper production year in 1959/60, Texas officials are fearful that there will be a substantial drop in oyster production during the 1960/61 season. Due to the heavy rainfall and frequent flooding along several major Texas rivers many oysters have undoubtedly been killed.

The San Antonio Espiritu Santo Bay area has been especially hard hit. Flood waters into San Antonio Bay made the Bay so fresh

that many oysters were bloated and killed. This area produced over 600,000 pounds of oyster meats last year, or almost one-half the entire Texas production.

Shucking oysters.

The great majority of Texas oysters are shucked locally and sold within the State. However, some shell stock is taken by Louisiana fishermen and processed in that State.

Puerto Rico

SMALL FISHING CRAFT MOTORIZATION CONTINUES:

Puerto Rico's Department of Agriculture and Commerce early in 1961 reported "The Commonwealth's program for small fishing craft mechanization has been functioning so successfully, that the administration contemplates seeing the Island's entire fleet fully mechanized by 1965."

The Director of the Fish and Wildlife Section of the Commonwealth's Department of Agriculture said, "Puerto Rican fishery reserves can still be further developed. One of the first steps in attaining a significant increase in production is to continue to expand our small craft mechanization program, thereby assisting fishermen. By so doing, they will be permitted to devote more time to fish, extending their radius of operation into new, more productive banks, presently out of reach of oar and sail."

Puerto Rico's annual fishing production is estimated to be in the area of 6 million pounds, with a wholesale value of more than $1 million. This fresh fish comes from adjacent Puerto Rican waters, and is harvested by a fleet of 1,091 boats, of which 365, or 33 percent are now motorized. Prior to the creation of Puerto Rico's Fisheries Loan Program (under which fishermen can borrow money to finance outboard motor purchases), there were only 913 licensed fishing craft. Of this amount, 210, or only 23 percent were motorized.

During the fiscal year 1958/1959, fishermen purchased 21 motors under the terms of the Fisheries Loan Program. During the 1959/1960 period, they acquired 116 additional units, bringing the combined total to 137 motors. The total value of these motors was $37,714, of which $33,738 was lent by the Government, while the fishermen supplied the balance as down payment.

A study was conducted by Puerto Rican authorities in order to evaluate the effects of mechanization with the following results:

1.- The average fisherman's weekly catch increased from 134 pounds prior to motorization, to 201 pounds thereafter, an increase of 67 pounds, or approximately 50 percent.

2.- Annual fish production increased 1.75 tons per fisherman after motorization.

Puerto Rico's Fisheries Loan Program was recently extended to include other phases of the fishing industry. These include the expansion and improvement of an already existent boat yard, and furnishing inland transportation facilities for fish wholesalers. Also, supplies and other related materials are sold to fishermen at cost price, at special stores established for this purpose.

The Puerto Rican Government's program for motorizing small fishing craft is an outstanding example of the benefits derived through modernization. These include: providing more vitally required protein in the form of fish food and economic improvements in fishing regions. The program also helps Puerto Rico to achieve its ultimate goal, developing a surplus for export. (Commercial Outboarder, Spring 1961.)

Salmon

COLUMBIA RIVER FISHING REGULATIONS FOR 1961:

Regulations for salmon fishing in the Columbia River in 1961 were adopted on January 18, 1961, at an all-day public meeting in Longview, Wash. The meeting was a joint one, with both the Washington State Department of Fisheries and the Oregon Fish Commission represented. It was the first official joint meeting held by the two conservation agencies in Washington for 44 years. Both commercial and sports fishing groups were represented at the meeting.

Basic regulations for 1961 are virtually the same as for 1960, with a total of 98 and one-quarter days of commercial fishing allowed. The spring season opened February 15 at noon and the fall season will close at noon October 31. As in 1960, the entire river and all tributaries will be closed to all fishing during November.

A breakdown of the 1961 season shows the regular commercial season open 14 days in February, 23 in April-May, 24 in June-July, 21 in July-August, and 16 in September-October.

These regulations are always subject to emergency changes. As in the past, careful consideration will be given the actual day-to-day status of the runs. Should conditions warrant, emergency hearings may be called and indicated changes made in the regulations.

The research staffs of both Oregon and Washington fisheries agencies presented information on the status of runs in the Columbia. They stressed that fall runs have fallen alarmingly and that emergency regulations may be necessary to curtail catches according to the number of salmon returning to the river in the fall. Concern was expressed over the increasing harvest of fall chinook and silver salmon and the staffs of both States went on record as favoring further discussion to determine the possibility of a complete closure of all fishing during certain critical periods. Evidence was also presented that an increasing sport fishery harvest in the Columbia River system is significantly reducing escapement of spring and summer chinook and summer steelhead.

Sharks

RESEARCH PANEL ESTABLISHED:

A Shark Research Panel was established by the American Institute of Biological Sciences at the request of the Office of Naval Research. The panel is headed by Dr. Perry W. Gilbert of Cornell University. The primary responsibilities of the Panel are to maintain a continuing review of all research activities conducted throughout the world which are pertinent to the shark-control problem.

The Panel has undertaken to compile a comprehensive list of all known cases of shark attack and authenticate these cases whenever possible by means of a questionnaire. This information is being summarized in a forthcoming book to be published by the Shark Research Panel.

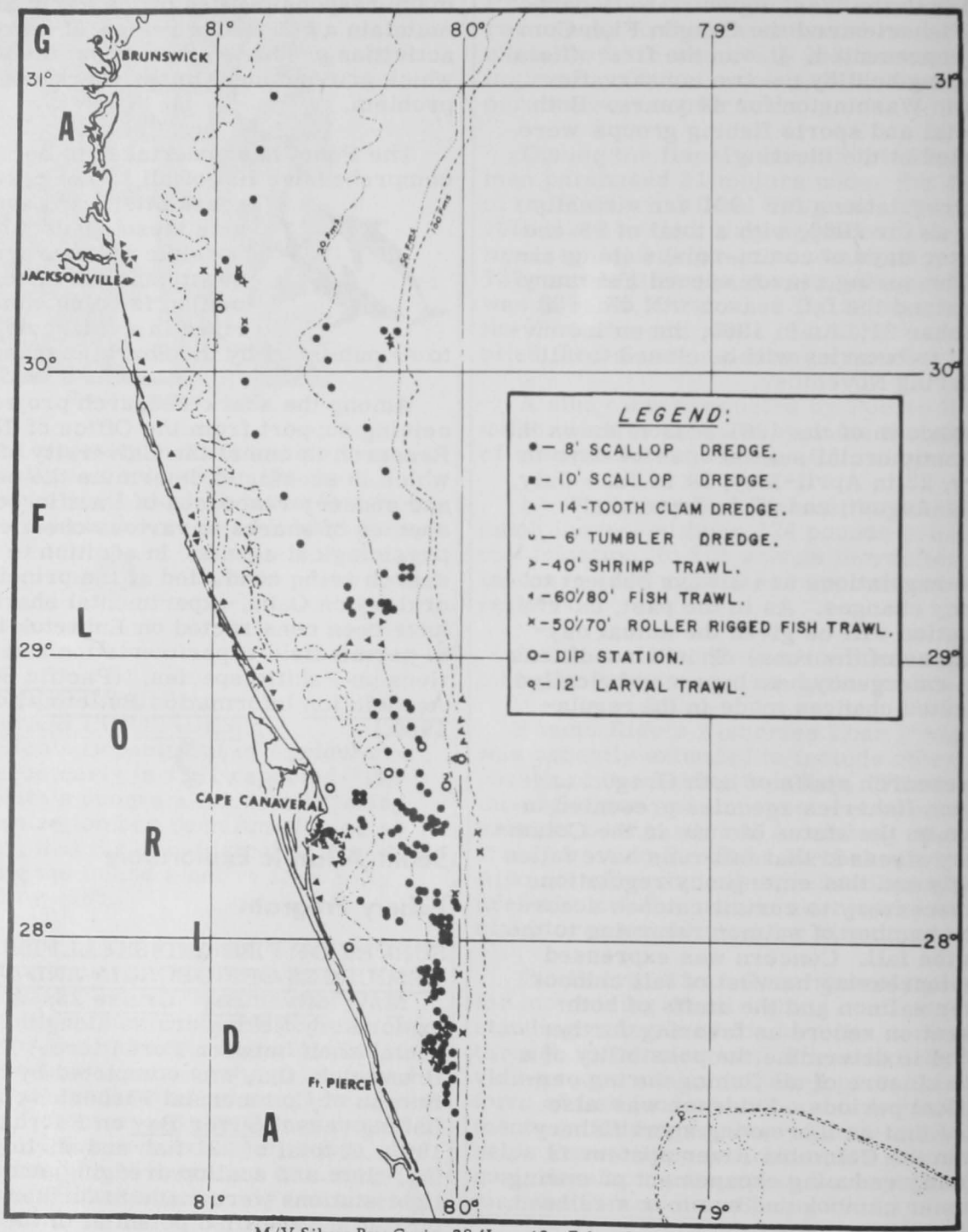
Among the shark-research projects receiving support from the Office of Naval Research is one at the University of Hawaii which is seeking to determine the behavior and sensory responses of Pacific oceanic species of sharks to various chemical and physiological agents. In addition to research being conducted at the principal laboratory on Oahu, experimental shark pens have been constructed on Eniwetok in order to permit field experimentation and observations on Pacific species. (Pacific Science Association Information Bulletin, November 1960.)

South Atlantic Exploratory Fishery Program

SURVEY OF FISH AND SHELLFISH RESOURCES OFF GEORGIA AND FLORIDA:

M/V "Silver Bay" Cruise 28: A 26-day exploratory fishing cruise along the continental shelf between Fort Pierce, Fla., and Brunswick, Ga., was completed by the U.S. Bureau of Commercial Fisheries chartered fishing vessel Silver Bay on February 10, 1961. A total of 221 fish and shrimp trawling, clam and scallop dredging, and night-light stations were made to further assess the fish and shellfish potential of the area.

Modified Georges Bank-type scallop dredges (8 and 10 foot) were fished in depths ranging from 12 to 65 fathoms, between Fort Pierce and Brunswick. Catches ranged up to 19 bushels of live scallops per 45-minute tow in 18 fathoms off Fort Pierce with a meat yield of $4\frac{1}{2}$ pints per 75-pound bushel. Large quantities of fresh, dead shell were taken at most dredging stations and small, probably young-of-the-year scallops were caught at the rate of 4 to 6 bushels per half hour tow north of Bethel Shoal. Thirteen observers participated in a one-day demonstration cruise out of Fort Pierce.



M/V Silver Bay Cruise 28 (Jan. 18, -Feb. 10, 1961).

Dredging for hard clams (Venus sp.) with a 14-tooth Fall River Clam Dredge was conducted between Eau Gallie and Jacksonville Beach. Generally negative results were obtained in the area surveyed. However, individual clams were taken in Cape Canaveral Cove and 300 dead shells were caught off Matanzas.

Fish and shrimp trawling was conducted between Fort Pierce and Brunswick. One 90-minute drag in 9 fathoms off Cocoa Beach produced, 2,500 pounds of mixed fish, of which 2,000 pounds were butterfish (Poronotus tricanthus). Off Vero Beach, 558 pounds of mixed fish, jewfish (Mycteroperca), and sea bass (Centropristes striatus) predominating, were taken in 50 fathoms. Shrimp trawling in the 80- to 100-fathom depth range off Cape Canaveral produced uniformly negative results.

Sport Fishing and Hunting

ECONOMIC SURVEY FOR 1960:

Interviewing on the second national survey of sport fishing and hunting began during the latter part of January 1961. The period covered in the survey will be calendar year 1960.

The interviewing phase of the task continued for about three weeks. Complete results will be available early in autumn, probably in September. The work was done by the U. S. Bureau of the Census under an agreement with the U. S. Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service.

This survey was undertaken, as was the one for 1955, at the request of the International Association of Game, Fish and Conservation Commissioners.

It will be financed by the Bureau of Sport Fisheries and Wildlife, using funds collected under the Federal Aid in Fish and Wildlife Restoration Acts. These funds are derived from an excise tax on hunting and fishing equipment, such as shotguns and fishing rods. These funds are distributed to the various states under a formula, based upon law, for use on a matching basis by the states in the restoration of fish and wildlife.

The cost of the survey will be within the portion of these funds specified by law as available for use by the Fish and Wildlife Service in the administration of the program. This means that the cost of the survey will not be charged to general taxes but to the special levy which sportsmen pay through the purchase of the specified sporting equipment.

About 8,000 persons were interviewed. The Bureau of the Census identified these sportsmen in December by screening the sample used in their monthly survey of the United States population. In addition to the customary information gathered in these periodic surveys, the Census Bureau identified the households in which there were one or more individuals 12 years old and older who had hunted or fished in 1960.

The 1955 survey showed that approximately 25 million Americans 12 years old or older had hunted or fished that year. There is reason to believe that there will be a substantial increase in 1960 due to such factors as improved conservation measures of state and Federal agencies, increased opportunities to hunt and fish, increased population, and increased incomes.

The data to be collected regarding the income and occupations of those who hunt and fish should show whether the participants are distributed throughout all occupations or whether there is a predominance of outdoor workers, office workers, or other groups.

Because of the growing importance of marine sport fishing, the 1960 survey will include a comprehensive study of this phase of angling--the first time such a complete study has been made in the United States. Catches of marine game fish by species, area in which they were taken, numbers, weights, and methods used in angling will be determined.

There are about 90,000 miles of tidal shoreline for the 50 states and islands. There are about 220 species of game fish involved, many of which are taken by hook-and-line for recreation.

Data will be gathered on the number of persons who fish in the surf, in the bays and sounds, in the tidal rivers, and in the deep sea. For fresh-water fishermen, data will show the number who fish in man-made ponds, in reservoirs, in natural lakes and ponds, and in the rivers and streams.

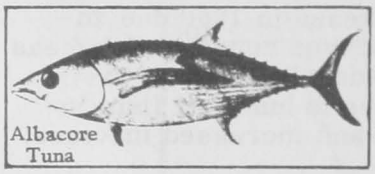
Hunters will be classified as to whether they hunted doves, waterfowl, other small game, or big game.

Tuna

WATER TEMPERATURES CORRELATED WITH ALBACORE ABUNDANCE:

Using ship injection temperatures, scientists of the U. S. Bureau of Commercial Fisheries Biological Laboratory at San Diego, Calif., have developed a 12-year sea temperature average (1947-1958) for the northeastern Pacific Ocean (20° N.-54° N.; 110° W.-150° W.). Charts for the anomalies from the 12-year period are under construction.

The purpose of these charts is to assist in the studies of the availability of albacore tuna with respect to variations in sea temperatures. Using these charts, it was found that in 1953, 1954, and 1955, the failure of the albacore fishery off the Washington-Oregon coast was contemporaneous with cold sea temperature anomalies of considerable magnitude.



Albacore Tuna

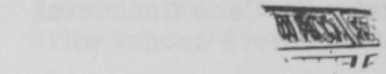
United States Consumption of Fishery Products, 1960

The preliminary estimate of the United States per capita consumption of fishery products in 1960 is 10.5 pounds edible weight, slightly less than the 10.7 pounds reported for 1959. The per capita consumption has remained fairly stable for the past 20 years with only slight fluctuations. But because the total population in that period has increased substantially, the total amount of fishery products consumed in the United States has increased steadily each year.

Table 1 - Apparent Civilian Per Capita Consumption of Fish and Shellfish in Edible Weight, 1935-39 and 1947-49; Annual Averages, 1958-60.

Commodity	1960 1/	1959	1958	Average 1947-49	Average 1935-39
	(Pounds)				
Fresh and frozen	5.9	5.9	5.9	6.0	5.4
Canned 2/	4.0	4.2	4.2	3.9	4.9
Cured	0.6	0.6	0.6	0.6	0.7
Total	10.5	10.7	10.7	10.5	11.0

1/Preliminary.
2/Excludes products containing small quantities of fish or shellfish, such as clam chowder, etc.



United States Fisheries

AVERAGE PRODUCTION YEAR IN 1960 ESTABLISHES NEW RECORDS FOR SEVERAL CATEGORIES:

In terms of total catch and value the Nation's commercial fishery activity for 1960 could be called average, but a review of the available data shows that five production records were broken, four new import marks were established, and the catch of one species hit a hundred-year low.

The total catch for 1960 was 4,850,000,000 pounds--270 million pounds below the catch of 1959; the value at boatside was estimated at $347 million, or one million dollars more than in 1959. In eight previous years the value has exceeded that figure.

Salmon, clam, and crab-meat cannery in Cordova, Alaska.

The amounts received by fishermen and vessel owners for California tuna, Gulf of Mexico and South Atlantic shrimp, and Alaska salmon increased sharply. The income from the New England groundfish harvest and from the Gulf and Atlantic menhaden fishery declined sharply, primarily because of lower prices. The Washington salmon fishermen and vessel owners also had reduced income because of the decline in the catch.

San Pedro, Calif., was the leading United States fishing port in both quantity (360 million pounds) and ex-vessel value ($40 million). Lewes, Del., was second on the basis of quantity only, 281 million pounds; then Pascagoula, Miss., 213 million; Gloucester, Mass., 194 million pounds. New Bedford, Mass., with good scallop landings was second in value with $13 million; followed by Boston, Mass., $9.4 million, and Gloucester, Mass., $6.4 million.

Production records were established on:

Canned tuna, with a record pack of 15.3 million cases as compared with the previous record of 14.3 million cases in 1959.

Sea scallops, with record landings of 26.5 million pounds of meats as compared with the previous high of 24.6 million pounds taken in 1959.

Gulf menhaden, with record landings of 831 million pounds, about 79 million pounds above the previous mark set in 1959. (Other menhaden fisheries showed declines.)

Menhaden oil production of almost 23.7 million gallons as compared with the previous high of 22.4 million gallons in 1956.

The Bristol Bay salmon run established a near record, yielding a United States catch of 15 million fish.

The oyster take of 59 million pounds of meats hit practically an all-time low. It has been well over 100 years since the annual oyster harvest has been that small. The 1960 harvest was less than 40 percent of that taken in 1880.

There were in 1960 record imports for shrimp, 113.4 million pounds; fresh and frozen spiny lobsters, 32.3 million pounds; canned oysters, 7 million pounds; fresh and frozen sea scallops, 6.9 million pounds. Imports of groundfish fillets and blocks were less than in 1959 but higher than in any other year prior to 1959.

The South Atlantic and Gulf shrimp catch was 236 million pounds, or 8 percent above the 1959 catch, but the harvest on the Pacific coast was 12.6 million pounds or 39 percent below the previous year. The total catch of groundfish (cod, cusk, haddock, hake, pollock and ocean perch) was 337 million pounds, or 4 million pounds less than in 1959. The catch of Pacific and jack mackerel was up; the total catch of menhaden was almost 2.0 billion pounds, 209 million pounds below 1959; the pack of Maine sardines was 1,975,000 cases, up 222,000 cases from the previous year; and the pack of California sardines was 636,000 cases, or 119,000 cases less than in 1959.

Shrimp trawlers at a dock in a Mississippi port.

United States Fishing Fleet[1/] Additions

JANUARY 1961:

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, January 1961

Area	January 1961	January 1960	Total 1960
	(Number)		
New England	3	1	34
Middle Atlantic	-	1	13
Chesapeake	3	5	76
South Atlantic	1	3	45
Gulf	11	4	85
Pacific	5	2	138
Great Lakes	-	-	17
Total	23	16	408

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

A total of 23 vessels of 5 net tons and over were issued first documents as fishing craft during January 1961--7 above the same month of 1960. The Gulf Area led with 11 vessels, followed by the Pacific with 5, New England

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, January 1960

Net Tons	Number
5 to 9	12
10 to 19	4
20 to 29	3
30 to 39	1
40 to 49	1
50 to 59	1
250 to 259	1
Total	23

1/Includes both commercial and sport fishing craft.

and the Chesapeake each with 3, and the South Atlantic area with 1.

U. S. Foreign Trade

SHRIMP IMPORTS, 1959-60:

United States imports of all shrimp (fresh, frozen, canned, and dried) from all countries in 1960 amounted to 113.4 million pounds as compared with 106.6 million pounds imported in 1959, an increase of 8.4 percent.

Shrimp imports from Mexico in 1960 totaled 73.5 million pounds, up about 7.2 percent from the 68.7 million pounds imported in 1959.

Some sharp increases and decreases in the United States imports of shrimp occurred from 1959 to 1960. Imports of shrimp from El Salvador increased 264.5 percent or from 1,838,000 pounds in 1959 to 6,699,000 pounds in 1960. On the other hand, shrimp imports from Japan in 1960 of 2,949,000 pounds were down by 59.2 percent from the 7,229,000 pounds imported in 1959. Imports of shrimp from British Guiana of 3,568,000 pounds in 1960 were up 269.0 percent from the 967,000 pounds imported in 1959. Iran increased its exports of shrimp to the United States by 65.7 percent in 1960 as compared with 1959, or from 740,000 pounds to 1,226,000 pounds; and Pakistan's 1960 exports jumped 59.0 percent or from 640,000 pounds to 1,018,000 pounds. Shrimp imports declined 4.3 percent from Panama, 11.0 percent from Ecuador, and 62.0 percent from Costa Rica. During 1960 shrimp were imported into the United States from 46 countries as compared with 49 countries in 1959. (See table in next column.)

Note: Most imported shrimp is frozen, except for some canned shrimp from northern Europe, Japan, and India; small quantities of dried shrimp from Japan and Hong Kong; and a small quantity of fresh shrimp from Mexico.

United States Shrimp Imports (Fresh, Frozen, Canned, and Dried), 1959-60

Country of Origin	1960	1959
	(1,000 Lbs.)	
Mexico by Customs Districts:		
Massachusetts	52	-
Florida	553	490
Charleston, S. C.	23	-
New Orleans	3,890	3,270
New York	92	-
Laredo	19,274	21,631
Galveston	140	-
El Paso	27	110
San Diego	1,599	1,444
Arizona	47,673	41,674
Los Angeles	227	34
Washington	4	-
Michigan	5	-
St. Lawrence	-	1
Oregon	25	-
Total Mexico	73,584	68,654
British Honduras	1	83
Greenland	26	-
Canada	332	134
El Salvador	6,699	1,838
Guatemala	259	182
Honduras	362	271
Nicaragua	266	213
Costa Rica	460	1,156
Panama	8,423	8,805
Canal Zone	-	64
Trinidad	194	-
Bahamas	79	-
Cuba	80	229
Leeward & Windward Islands	-	13
Netherlands Antilles	-	46
Jamaica	-	48
Colombia	2,173	1,899
Venezuela	344	370
British Guiana	3,568	967
Surinam	381	288
Ecuador	4,193	4,712
Peru	256	279
Chile	738	327
Brazil	46	79
Argentina	61	946
Iceland	92	32
Sweden	2	13
Norway	110	160
Denmark	80	196
United Kingdom	-	62
Netherlands	1	2
West Germany	2	82
Finland	-	1
Spain	225	192
Italy	-	185
Lebanon	-	5
Turkey	-	2
Iran	1,226	740
Israel	2	43
Kuwait	147	-
Saudi Arabia	77	-
India	2,892	2,866
Pakistan	1,018	640
Singapore	-	1
Indonesia	7	-
Philippines	24	1
Vietnam	97	1
Thailand	40	52
Korea	76	198
Hong Kong	2	640
Taiwan	3	15
Japan	2,949	7,229
Australia	128	284
New Zealand	26	-
Egypt	1,668	1,310
Grand Total	113,419	106,555

* * * * *

EDIBLE FISHERY PRODUCTS, DECEMBER 1960:

Imports of edible fresh, frozen and processed fish and shellfish into the United States during December 1960 decreased by 11.3 percent in quantity and 6.1 percent in value as compared with November 1960. The decrease was due primarily to lower imports of groundfish and other fillets (down 4.3 million pounds),

and frozen albacore and other tuna (down 1.7 million pounds), and to a lesser degree, a decrease in the imports of frozen shrimp and canned and fresh and frozen salmon. The decrease was partly offset by a 2.0-million-pound increase in the imports of lobster and spiny lobster.

Compared with December 1959, the imports in December 1960 were down by 20.3 percent in quantity and 12.1 percent in value due to lower imports of frozen albacore and other tuna (down 6.8 million pounds), and groundfish and other fillets (down 7.8 million pounds). Compensating, in part, for the decrease was an increase of about 1.8 million pounds in the imports of shrimp (up 1.8 million pounds) and an increase of 0.6 million pounds in the imports of canned tuna in brine.

U. S. Imports and Exports of Edible Fishery Products, December 1960 with Comparisons

Item	Quantity			Value		
	December		Year	December		Year
	1960	1959	1959	1960	1959	1959
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed 1/	77.9	97.7	2/ 1,070.3	24.8	28.2	309.6
Exports:						
Fish & shellfish: Processed only (excluding fresh & frozen)	4.8	5.4	68.0	2.0	1.5	22.8

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

United States exports of processed fish and shellfish in December 1960 were lower by 4.0 percent in quantity and 13.0 percent in value as compared with November 1960. Compared with the same month in 1959, the exports in December 1960 were down 11.1 percent in quantity but higher by 33.3 percent in value. The lower quantity of exports in December 1960 as compared with the same month in 1959 were due to a drop in the exports of California sardines and frozen salmon. However, the value of the December 1960 exports increased sharply due to higher exports of high-value canned salmon and canned and frozen shrimp.

* * * * *

FISH OIL EXPORTS IN 1960 DOWN SLIGHTLY:

United States exports of fish oils in 1960 totaled 71,830 short tons--a decline of less than one percent from the record of 72,240 tons set in 1959. Exports in 1960, as in 1959, consisted roughly of three-fourths of the fish oil produced in 1960.

Fish oil shipments to Europe (leading market area) dropped 5 percent, probably reflecting increased competition from Pe-

U. S. Exports of Fish Oils (Including Liver Oils) by Country of Destination, Averages 1935-39 and 1950-54, Annual 1956-60

Country of Destination	1960 1/	1959 1/	1958	1957	1956	Average 1950-54	Average 1935-39
	(Short Tons)						
North America:							
Canada	4,923	1,920	6,485	1,228	1,621	2,707	458
Cuba	21	57	99	129	112	113	155
Mexico	290	223	123	56	63	109	45
Other	5	146	12	9	37	26	71
Total	5,239	2,346	6,719	1,422	1,833	2,955	729
South America	26	10	26	42	62	84	96
Europe:							
Belgium-Luxembourg	343	2,167	2,344	661	759	215	8
Denmark	10	577	-	-	866	-	-
France	20	40	5	5	-	273	19
West Germany	13,041	16,588	17,118	26,296	32,491	12,913	2/126
Italy	-	10	119	178	60	71	15
Netherlands	26,567	22,058	10,920	14,978	25,023	18,260	15
Norway	7,959	8,054	5,794	5,272	6,251	1,444	10
Sweden	18,013	20,355	3,370	7,716	2,646	-	7
Switzerland	-	-	558	794	367	4,994	15
United Kingdom	568	5	-	854	920	335	77
Other	13	-	-	-	-	25	8
Total	66,534	69,854	40,228	56,754	69,383	38,530	300
Asia:							
Philippines	2	-	-	7	10	585	66
Other	24	30	31	6	5	28	24
Total	26	30	31	13	15	613	90
Africa	6	-	17	305	24	25	19
Oceania	1	-	-	4	-	-	-
Grand Total	71,832	72,240	47,021	58,540	71,317	42,207	1,234

1/Preliminary. 2/Total Germany

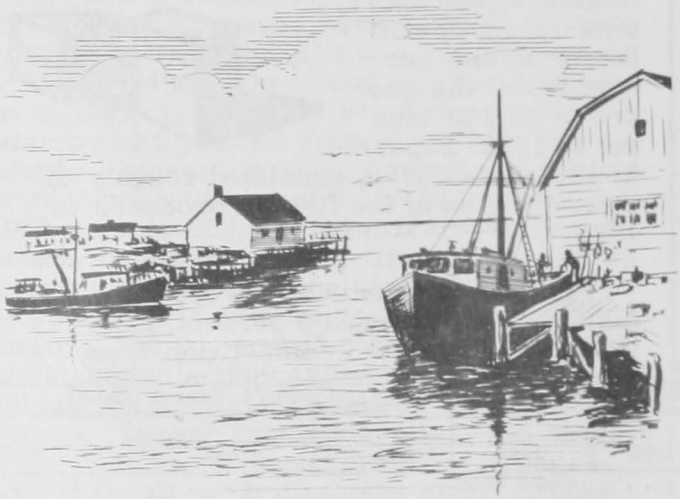
ruvian and Icelandic fish oils, plus an increasing use of vegetable oils in the manufacture of margarine. In most of 1960, soybean and cottonseed oils were relatively low-priced.

Fish oil exports to Canada were up sharply in 1960, due to the decline in production of herring oil in British Columbia.

Vessel Mortgage Insurance Program

FIRST APPLICATION APPROVED:

The U. S. Department of the Interior program for insuring mortgages on fishing vessels was inaugurated in January 1961, with the approval of the application of an Alaska salmon canner under the program.



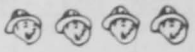
The amount of the insured mortgage was $75,000. It covered a loan made by a Seattle bank to Joseph R. Fribrock of the Snug Harbor Canning Company. The period of the mortgage is eight years. The company is building 10 gill-net vessels to replace fish traps which have been abolished in Alaska. The cost of the vessel construction is about $105,000.

Under the mortgage insurance program the Department guarantees the lender or mortgage holder the insured amount. Should the borrower fail to pay, the Department pays but has legal recourse to the borrower's assets.

Authorization for the mortgage and loan insurance program was given the Department of the Interior in March 1958, when the fishing vessel mortgage program was transferred from the Maritime Administration. It was not until July 1960 that Congress approved a method of financing the program should financing be necessary.

Persons obtaining mortgage insurance pay the Department one percent per year on the average unpaid balance of the loan. This money goes into a revolving fund which is available to pay claims. Should, at any time, the claim exceed the amount in the revolving fund, the Department of the Interior has the right to borrow the required amount from the Treasury.

The fishing vessel mortgage and loan insurance program is administered by the Bureau of Commercial Fisheries, Fish and Wildlife Service. The Bureau has administered a loan program for the replacement or repair of vessels and fishing gear for some years and also has authority for a vessel construction subsidy program.

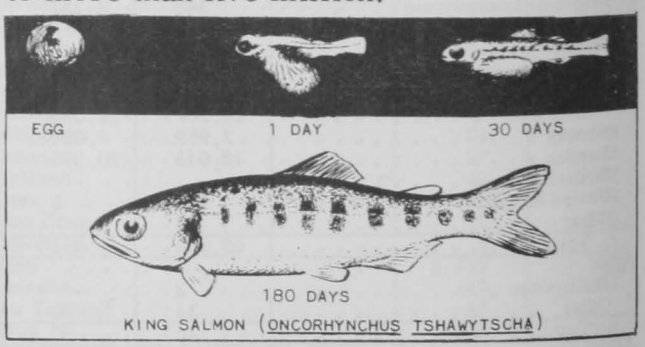


Washington

PLANT OF TWO MILLION KING SALMON MARKS BEGINNING OF LARGE-SCALE FISH-FARM EXPERIMENT:

The more than two million fall chinook or king salmon fry planted in Washington's Capitol Lake, marks the beginning of the largest fish-farm experimental plant of young salmon ever conducted by a fisheries agency, the Director of the Department of Fisheries announced on February 17, 1961.

The two million salmon were put in the lake in mid-February and plants within the next month of an additional three million-plus young salmon will bring the total plant to more than five million.



All the young salmon were hatched from eggs taken from the 1960 fall run of chinook salmon to Capitol Lake and the Deschutes

River. The fry have been hatched and feeding started in hatchery ponds at the Simpson and Minter Creek stations before being put into the lake. Diet for the young fry while in the lake will consist of natural food such as insect larvae, small crustaceans, etc. along with a supplemental diet of hatchery fish food. The supplemental diet will be a special formula of the usual hatchery production diet, consisting of shrimp meal, herring, some beef liver, turbot, and other fish products. It will be processed and frozen into 50-pound blocks and placed in the lake at a number of feeding stations. With this procedure it is expected that the salmon growing in Capitol Lake will require less than half the feed they would in the hatchery ponds.

The fall chinook salmon run to Capitol Lake and the Deschutes has long been considered one of the most successful of artificially created runs. Last fall more than 10,000 adult chinook returned to the river. Prior to 1946, when the first plants of chinook were made in the lake, there were no runs of salmon in the Deschutes. Plants after that date, along with the construction of the three fish ladders in the stream, have made the Deschutes an important salmon producer, with an estimated 150,000 to 200,000 chinook salmon produced for sports and commercial fishermen in the State.

* * * * *

UNDERWATER EXPLOSIONS CAUSE LITTLE DAMAGE TO FISH:

Little damage to fish resulted from a series of underwater explosions set off by a California Oil Company along the east side of Whidbey Island during the third week in January 1961, the Director of the Washington State Department of Fisheries stated on February 3. He emphasized that no salmon were killed by the blasts. The seismic blasting was carried out by the oil company in a quest for oil around the Island.

Fisheries biologists observed all detonations and also observed preliminary test explosions in late December. Results of this test indicated that fish kills would be minor, an indication that was confirmed when the survey was conducted.

During January 16-20, a total of 196 90-pound charges of a special seismic blast powder (EP-198-B) were set off in the waters of Saratoga Passage between Penn Cove and Columbia Beach. Examination of the shot area for dead fish was made after each blast.

When possible, biologist skin divers checked for fish on the bottom. Diving was not feasible on many shots due to the muddy water and extreme depths.

Summary of number of blasts and fish kills observed is as follows:

January 16, North of Holmes Harbor--15 shots, 96-144 herring observed floating on surface; 360-480 herring estimated to have been killed and sank to bottom; 3 shiners killed--one floated, two sank.

January 17, North of Holmes Harbor--61 shots, 1 herring possibly killed, not recovered.

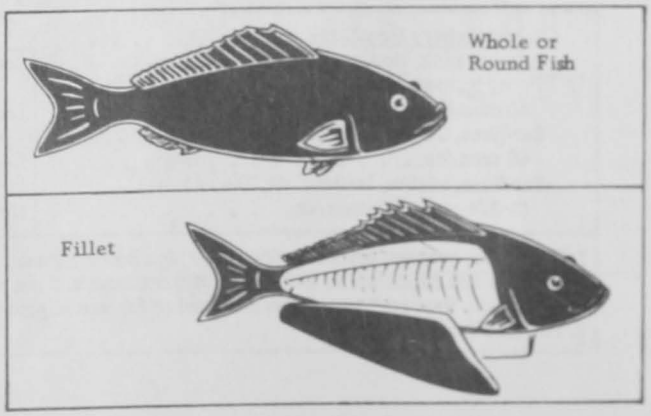
January 18, North of Holmes Harbor--10 shots, 1 true cod observed killed.

January 19, South of Holmes Harbor--67 shots. No fish kills observed; nine shots not checked, all in deep water.

January 20, North of Holmes Harbor--43 shots, 24 white perch, 1 copper rock fish and, approximately 12 herring were killed.

Wholesale Prices, February 1961

The February 1961 wholesale price index for edible fishery products (fresh, frozen, and canned) at 133.0 percent of the 1947-49 average was up 1.6 percent from the preceding month and up 9.2 percent from the same month of 1960. The rise from January to February this year was due mainly to



A busy day at the Boston Fish Pier. Trawlers unloading groundfish into boxes for weighing.

higher prices for frozen dressed halibut, fresh shrimp, and frozen haddock and ocean perch fillets. In February this year as compared with February a year ago prices were mixed, but substantially higher for most of the items listed in the index.

The fresh and frozen drawn, dressed, and whole finfish subgroup index in February this year declined 1.5 percent from the preceding month. This drop was due to seasonally lower prices for haddock at Boston--down 19.7 percent. As a rule, haddock prices at Boston reach the yearly low in February and March. Further increases in prices for frozen halibut and salmon plus some increases in the prices for fresh-water fish this February failed to offset the sharp drop in drawn haddock prices. As compared with February a year ago, this February's subgroup price index was up by 8.8 percent because frozen dressed king salmon prices were up 18.8 percent and frozen dressed Pacific halibut prices were up 9.6 percent. The increases offset the drop in prices for fresh haddock of 16.9 percent and for fresh yellow pike at New York City of 4.8 percent.

From January to February this year, the fresh processed fish and shellfish subgroup price index rose 6.3 percent due to a 16.6-percent jump in the fresh shrimp prices at New York City. This increase was partially offset by a drop of 14.1 percent in the prices of fresh small haddock fillets at

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1961 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1947-49=100)			
			Feb. 1961	Jan. 1961	Feb. 1961	Jan. 1961	Dec. 1960	Feb. 1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					133.0	130.9	133.2	121.8
Fresh & Frozen Fishery Products:					148.9	146.2	150.0	134.9
Drawn, Dressed, or Whole Finfish:					160.2	162.7	173.6	147.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.12	100.5	125.2	178.0	120.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.32	.30	99.0	92.8	92.8	90.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.91	.90	205.0	202.2	202.2	172.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.75	.73	186.0	179.8	185.9	185.9
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.63	.63	126.4	126.4	151.7	136.6
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.69	.65	161.8	152.4	117.3	170.0
Processed, Fresh (Fish & Shellfish):					155.1	2/145.9	146.8	134.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.34	.39	114.0	132.7	175.2	139.5
Shrimp, lge. (26-30 count), headless, fresh.	New York	lb.	.88	.75	138.2	118.5	114.5	112.2
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	185.6	185.6	185.6	163.9
Processed, Frozen (Fish & Shellfish):					117.4	116.0	115.0	110.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	102.1	102.1	102.1	98.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.36	.35	113.0	109.9	106.7	97.3
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.31	.30	122.8	118.8	118.8	110.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.70	.70	108.0	107.2	106.5	104.1
Canned Fishery Products:					110.9	109.9	109.8	103.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.00	27.50	146.1	143.5	143.5	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.00	11.00	79.3	79.3	79.3	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.75	7.75	91.0	91.0	89.8	93.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.50	8.50	90.5	90.5	90.5	93.1

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 from 146.0.

Boston. In February this year, the subgroup index advanced 15.3 percent from February 1960. Higher prices for fresh shrimp (up 23.2 percent) at New York City and fresh shucked oysters (up 13.2 percent) at Norfolk more than compensated for the substantial drop (14.1 percent) in fresh small haddock fillet prices at Boston.

Wholesale prices in February this year for frozen processed fish continued to show a firm market for frozen fillets as compared with the preceding month and the late months of 1960. The over-all subgroup index rose 1.2 percent from January to February due to higher prices for frozen haddock and ocean perch fillets, and frozen shrimp at Chicago. From February 1960 to this February, the frozen processed fish and shellfish index rose 6.5 percent because of higher prices for haddock fillets (up 16.1 percent), ocean perch fillets (up 10.8 percent), flounder fillets (up 4.1 percent), and frozen shrimp at Chicago (up 3.7 percent).

Canned fish prices continued the steady trend noted in recent months with the February 1961 index up about 1 percent from January due to an increase in primary prices (50 cents a case) for pink salmon (supplies are practically exhausted). Prices of the other canned fish items in the subgroup remained unchanged from January to February. However, from February 1960 to this February the subgroup index rose 6.8 percent due to a 14.3-percent rise in canned pink salmon prices and a slight increase in canned tuna prices. Canned Maine sardine prices this February were about 25 cents a case under those for February 1960.