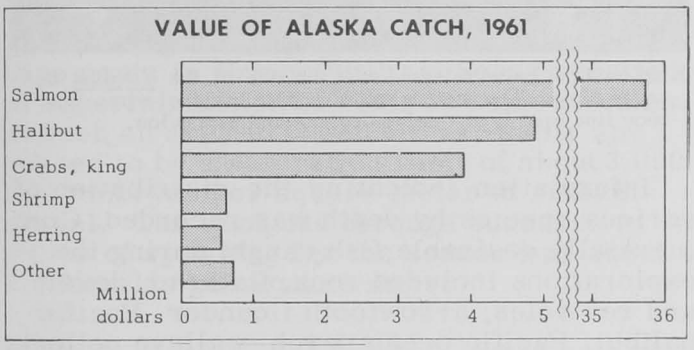
TRENDS AND DEVELOPMENTS

Alaska

FISHERIES LANDINGS, 1961:

The 1961 commercial catch of fishery products in Alaska totaled 414 million pounds valued at $46.5 million ex-vessel. This was an increase of 55.5 million pounds or 15 percent in quantity and $5.5 million or 14 percent in value as compared with 1960.



The increased landings in 1961 resulted from a 264.8-million-pound catch of salmon--a gain of 57.7 million pounds over the previous year. The catch was the largest since 1956, although far below the record 726.9 million pounds taken in 1936. A new king crab record was established when landings reached 43.4 million pounds--14.8 million pounds above 1960. Catches of halibut (33.4 million pounds round weight) and shrimp (16 million pounds) were up 5 million pounds and 8.5 million pounds, respectively. The total gain would have been even greater had there not been a large decline in the take of sea herring. Landings of this species (49.5 million pounds) were 28 million pounds less than in 1960 and 58 million pounds lower than in 1959.

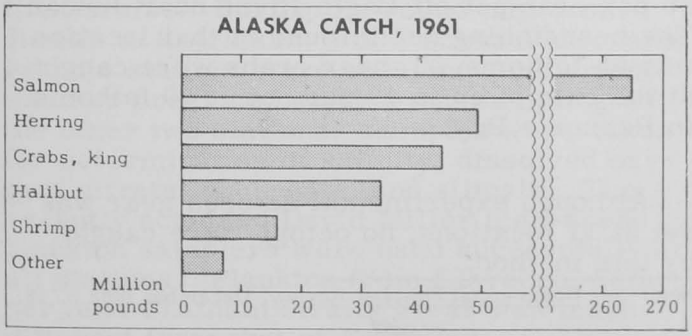


Fig. 1 - A deckload of king crabs aboard a vessel fishing off Kodiak Island in February.

The value of the Alaska catch in 1961 was up, largely due to increases in the value of salmon, king crab, and halibut.

There were 15,776 fishermen engaged in Alaska fisheries in 1961--about 1,446 more than in the previous year. The increase took place in the shore and boat fisheries. Commercial fishing craft operated during the year consisted of 2,096 vessels totaling 41,771 gross tons and 6,778 motor boats.

During 1961, there were 157 fishery wholesale and manufacturing establishments in Alaska which gave employment to 8,702 persons. Fishery products produced by those firms were valued at $128.5 million--about $31.8 million more than in the pre-

Fig. 2 - Picking red salmon from gill net aboard a vessel in Bristol Bay.

vious year. The gain was due primarily to the increase in production of frozen crab meat, dressed halibut, and canned salmon.

Alaska Fisheries Exploration and Gear Research

DISTRIBUTION OF POTENTIALLY VALUABLE STOCKS OF FISH AND SHELLFISH STUDIED:

M/V "Yaquina" Cruise 62-3 (October 9-November 12, 1962): To determine the extent and approximate distribution of potentially valuable stocks of fish and shellfish in certain southeastern Alaskan waters was the objective of the 5-week exploratory cruise by the U. S. Bureau of Commercial Fisheries chartered vessel Yaquina. The area surveyed included Lynn Canal, Chatham Strait, Icy Strait, and Glacier Bay. Shrimp trawls, crab pots, and experimental octopus traps were used during sampling operations.

Depths from 10 to 395 fathoms were sampled in a series of 58 half-hour trawl drags. Shrimp trawls measuring 41 feet and 57 feet were towed from a single wire with a 25-fathom bridle. Six to 9 king crab pots were set at 12 locations at depths ranging from 35 to 100 fathoms. Trials were also carried on with octopus trap gear.

King crab pot being released over the side of the Yaquina on cruise 62-3. The mesh is knit from stainless steel wire. The buoy line used is part polypropylene and part nylon.

Information indicating the distribution of various species by depth was recorded. Commercially desirable fish caught during the explorations included rock, flathead, dover and rex soles, arrowtooth flounder, Pacific halibut, Pacific ocean perch, walleye pollock, and sablefish.

Good quantities of shrimp were caught in the Glacier Bay area. Up to 600 pounds of shrimp were caught during 30-minute trawl drags with a 57-foot shrimp trawl. The catches in 17 successful trawl drags in Glacier Bay averaged 56 percent pink shrimp and 35 percent side-stripe shrimp. The best catches of pink shrimp were in depths between 25 and 50 fathoms; side-stripe shrimp were most abundant in drags from 100 to 125 fathoms.

King crabs were caught at the rate of 7 to 26 per crab pot off Eagle River near Juneau. The best fishing depth found at that location was 55 fathoms. Tanner crabs were caught at the rate of up to 49 per pot at 60 fathoms in Berner's Bay.

Although experimental octopus gear was set at 11 locations, no octopi were caught by this method.

Note: See Commercial Fisheries Review, December 1962 p. 18.

Alaska Fisheries Investigations

The following is a report of October 1962 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska:

PINK SALMON STUDIES:

Further studies were made of the use of vertebral counts for racial identification of salmon. Using modified staining techniques, biologists studied pink salmon fry collected from Auke Creek during the 1962 spring migration. Analysis of the data has shown a progressive seasonal increase in the variability of vertebral counts, which raises important questions concerning: (1) the effects of environmental changes during the early embryonic stages of the fry, and (2) differential rates of fry development within and between redds in a single spawning area.

The large 1962 pink salmon spawning escapements in Prince William Sound resulted in superimposition of nests in some streams. In such an area in Olsen Creek, there appeared to be a saturation limit of about 3,000 live embryos per square meter of stream gravel. The total use through successive waves of spawning for the season was about 2.5 females per square meter.

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RED SALMON STUDIES:

The Karluk research station was closed in early October after a red salmon escapement of 560,000 fish, the largest since 1953 was enumerated. Most of the returning fish were from the 1957 brood and had spent two growing seasons in Karluk Lake. The parent year escapement was about 220,000 salmon.

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OCEANOGRAPHY STUDIES:

The Murre II, recently equipped to take limited oceanographic data, completed its first cruise. During the round trip from Juneau to Ketchikan, 5 of 7 scheduled oceanographic stations were occupied. Inclement weather precluded studies and sampling at the other two stations. Samples were taken for determination of salinity, dissolved oxygen, nitrate, phosphate, and silicate. The recently acquired David Miller high-speed plankton samplers were used successfully at all stations. Plankton from Clarence, Sumner, and Chatham Straits areas was much different from that of Auke Bay.

American Fisheries Advisory Committee

INTERIOR SECRETARY APPOINTS FOUR TO COMMITTEE:

The appointment of four new members of the American Fisheries Advisory Committee and the selection of a new executive secretary for the 20-man group was announced on November 22, 1962, by Secretary of the Interior Stewart L. Udall.

New members of the committee, which advises the Secretary of the Interior on commercial fishery problems, are Ammon G. Dunton, White Stone, Va.; J. Roy Duggan, Brunswick, Ga.; Thomas D. McGinnes, Irvington, Va.; and Roy Prewitt, Lonoke, Ark.; Robert D. Balkovic, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C., is executive secretary.

Besides the four new appointees, the American Fisheries Advisory Committee includes Ralph E. Carr, President, Mid-Central Fish Company, Kansas City, Mo.; Harold F. Cary, Assistant to the President, Van Camp Sea Food Company, Long Beach, Calif.; Chris Dahl, Kayler-Dahl Fish Company, Petersburg, Alaska; George J. Davidson, Boston, Mass.; Louis Fischer, Fischer Sea Foods, Cocoa, Fla.; Ray H. Full, President, Kishman Fish Company, Vermilion, Ohio; H.R. Humphreys, Jr., President, Standard Products Company, Inc., White Stone, Va.; Leon S. Kenney, President, Pinellas Seafood Company, St. Petersburg, Fla.; E. Robert Kinney, President, Gorton's of Gloucester, Gloucester, Mass.; John S. McGowan, Vice President, Bumble Bee Seafoods, Inc.; Astoria, Oreg.; James McPhillips, Vice Chairman, Southern Industries Corporation, Mobile, Ala.; John Mehos, Liberty Fish and Oyster Company, Galveston, Tex.; Authur H. Mendonca, President, F.E. Booth Inc., San Francisco, Calif.; Anthony Nizetich, Manager, Fisherman's Cooperative Association, San Pedro, Calif.; Einar Pedersen, Seattle, Wash.; and Daniel H. Smith, Smith Brothers of Port Washington, Port Washington, Wis.

Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, is the permanent chairman.

California

COMMERCIAL SALMON LANDINGS LOWER IN 1962:

California's commercial landings of salmon for the 1962 season ended September 30 were estimated to be 6 million pounds, announced the California Department of Fish and Game. This was a 30-percent drop from the previous year's landings of 8.6 million pounds. Although the decline was fairly sharp, it was attributed to normal fluctuations in salmon populations.

California's highest commercial salmon catch on record was 10.3 million pounds in 1956. Landings for the past five years were (in million pounds): 8.6 in 1961, 6.2 in 1960, 6.8 in 1959, 3.6 in 1958, and 5.2 in 1957. California's commercial salmon landings have averaged 5 million pounds a year during the 40 years that catch records were kept by the Department of Fish and Game.

Of the total salmon landed during the 1962 season, Eureka accounted for 2.5 million pounds as compared with 1.4 million pounds in 1961. San Francisco was in second place with landings of 1.5 million pounds as against 3.7 million pounds a year earlier.

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CONGRESSMEN REVIEW ANADROMOUS FISH RESOURCES:

The plight of California's salmon and steelhead trout was reviewed during the first week in December 1962 when U. S. Congressmen John Dingell (D. Michigan) and George A. Goodling (R. Pennsylvania) spent two days viewing the salmon and steelhead problem areas of that State with representatives of the California Department of Fish and Game and the U. S. Fish and Wildlife Service.

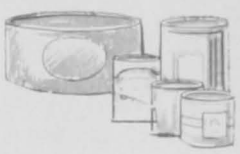
Congressman Dingell is the chairman of the Subcommittee on Fish and Wildlife Conservation of the Committee on Merchant Marine and Fisheries which is concerned with an $11-million Federal aid proposal for the anadromous fish resources of California.

California's anadromous fish species, including salmon, steelhead, striped bass, and shad, face grave difficulties today. The spawning areas where those fish are produced have been drastically reduced by dams and water developments in the past. The water developments are continuing at an even greater pace today and the State's efforts to save the fisheries resources in the process of those developments, although intensive, cannot begin to catch up with past losses.

Because of this danger to a multimillion dollar sport and commercial resource, the $11-million Federal aid program for California's anadromous fish resources was proposed by California Senator Clair Engle and the late Congressman Clem Miller during the last Congress. (December 1, 1962, press release from California Department of Fish and Game.)

Cans--Shipments for Fishery Products, January-September 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-September 1962 was 7.5 percent above that used during the same period in 1961. The increase was due mainly to an increase of 28.5 percent in combined shipments to the Eastern, Southern, and North Central Areas. The pack of Maine sardines in 1962 was much greater than in 1961 and the 1962 pack of tuna will be a record one.



U. S. Domestic Shipments of Metal Cans for Fishery Products, January-September 1961 and 1962
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter		Jan.-Sept.	
	1962	1961	1962	1961	1962	1961	1962	1961
East 1/	158,531	2/	189,556	2/	341,193	2/	689,280	2/
Southern	13,403	2/	32,668	2/	21,765	2/	67,836	2/
North Central	63	2/	29	2/	22	2/	114	2/
Total 2/	171,997	193,197	222,253	215,510	362,980	180,504	757,230	589,211
West 3/	414,199	335,133	701,831	708,423	562,140	633,374	1,678,170	1,676,930
Total all areas	586,196	528,330	924,084	923,933	925,120	813,878	2,435,400	2,266,141

1/Includes Puerto Rico.
2/The grouping of States by geographic areas for reporting purposes was changed in 1962 so only total shipments in 1961 to the East, Southern, and North Central Areas are shown.
3/Includes Alaska and Hawaii.

In January-September 1962, shipments to the Pacific or Western Area accounted for 68.9 percent of total shipments; shipments to the Eastern Area accounted for 28.3 percent; and shipments to the Southern Area accounted for most of the remaining 2.8 percent. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing cans. The data for 1961 cover only shipments of steel (tinplate) cans, but the data for 1962 cover shipments of steel and aluminum cans. It is believed that only a small amount of aluminum is being used in cans for fishery products at present. The tonnage equivalent figure for 1961 data is derived by use of the factor 23.0 base boxes per short ton of steel. The tonnage equivalent figure for 1962 data is derived by use of the factor 21.8 base boxes per short ton of steel. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size.

(2) See Commercial Fisheries Review, Dec. 1962 p. 27, Aug. 1962 pp. 16-17.

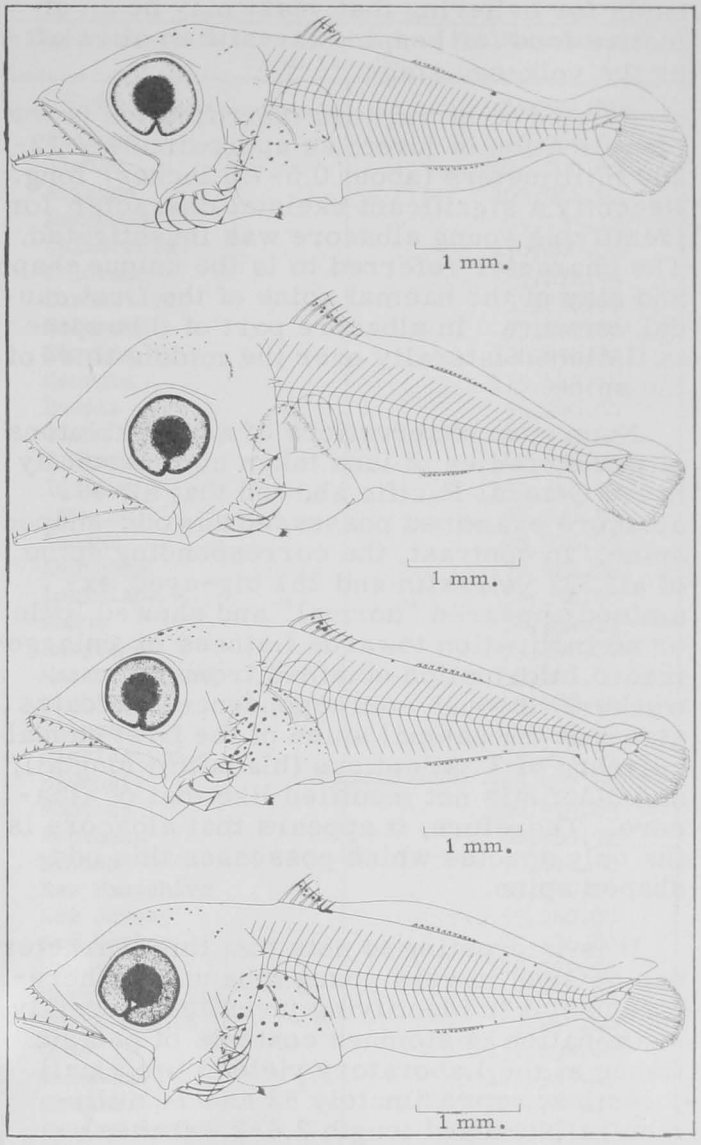
Central Pacific Fisheries Investigations

PROGRESS MADE IN THE IDENTIFICATION OF TUNA LARVAE AND JUVENILES:

The problem of identifying larvae of the various tunas has been actively investigated for a number of years by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu. Notable progress has been made in the past in identifying larvae of Auxis sp. (frigate mackerel); Euthynnus lineatus, E. alletteratus, E. yaito (black skipjack or little tunny); E. pelamis (skipjack), and Thunnus albacares (yellowfin) taken in plankton net hauls. More recently some progress was noted also in the tentative identification of T. obesus (big-eyed), T. alalunga (albacore), T. thynnus (bluefin), and T. tonggol (longtail), but the identification was based to some extent on circumstantial evidence. In order to ascertain the accuracy of this identification, it was believed that a more direct approach to the problem was necessary; specifically, by fertilizing the eggs artificially and rearing the larvae past the yolk-sac stage or the stage at which the mouth has become functional.

Because opportunities to collect ripe gonads of both sexes of tuna of the same species simultaneously are rare, and because of a lack of general information on the best way to handle and care for eggs and larvae of marine fishes, it was decided to attempt as a first step, to hatch various unidentified pelagic fish eggs taken in plankton nets and to rear the larvae as long as possible. This was done during the Charles H. Gilbert Cruise 60 (September 26-October 12, 1962) in calm water off Kona, Hawaii.

The eggs of a number of fish were carried through hatching, and the hatched larvae were successfully reared through the yolk-sac stage. In common with the experience of other workers, it was found that the eggs could be hatched quite easily in 4-ounce jars or larger, depending on the number of eggs: the fewer the eggs per unit volume of water, the more successful the hatching. An adequate amount of water was found to be quite important to insure survival of the larvae. Changing about one-third the volume of water 3 or 4 times daily materially increased the length of time the larvae could be kept alive. The prompt removal of all dead eggs and larvae increased the survival rate of the remaining larvae.



Larvae of (top to bottom) albacore, big-eyed, Australian northern bluefin, and Pacific bluefin.

During the rearing of the larvae, a feeding experiment was conducted. A very small amount of yeast dissolved in water, 1 drop or less, was fed to a group of larvae which had already developed functional mouths. Another group of larvae of the same species was kept as a control. The group that had been fed remained alive about 2 days longer than those that had not been fed. It was also learned that the time of initiation of feeding may be very critical for survival of the larvae. Whenever food was placed in the aquarium before the functional mouth had formed, the larva died within a day or so, quite possibly as a result of water contamination caused by the unutilized food. Although the results of this single trial are not conclusive, they provide us some

basis for believing that yeast may be an effective food for keeping larval fish alive after the yolk-sac stage.

Related to larval tuna identification is the identification of juveniles approximately 12-200 millimeters (about 0.5-7.9 inches) long. Recently a significant skeletal character for identifying young albacore was investigated. The character referred to is the unique shape and size of the haemal spine of the first caudal vertebra. In albacore part of this spine is flattened laterally over the middle third of the spine.

Numerous observations of adult skeletons of three species of tuna taken commercially in the Central Pacific showed that all 492 albacore examined possessed this odd-shaped spine. In contrast, the corresponding spine of all 337 yellowfin and 251 big-eyed examined appeared "normal" and showed little or no inclination towards flatness or enlargement. Information obtained from other workers, through correspondence, indicates also that the haemal spine of the first caudal vertebra of T. atlanticus (blackfin), longtail, and bluefin is not modified like that of albacore. Therefore, it appears that albacore is the only species which possesses this odd-shaped spine.

It is interesting to note that this character can be seen in very young tuna and is therefore useful in identifying juveniles. Recently examination of stomach contents of pelagic fishes at the Laboratory yielded two small juveniles, approximately 62 and 74 millimeters (standard length 2.4-2.9 inches), possessing this modified spine. Although the exact size at which this character develops has not yet been determined, it is fairly certain that it is present in juveniles much smaller than 60 millimeters (2.3 inches).

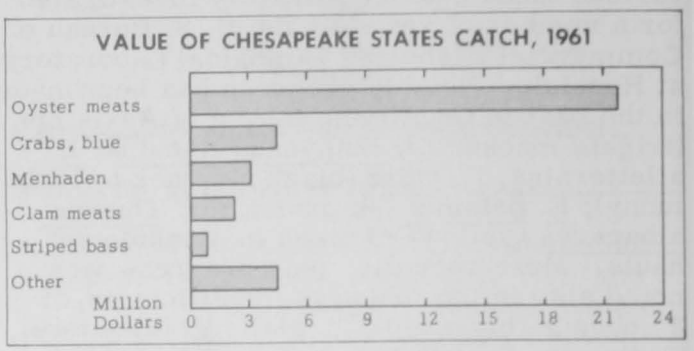
The ability to recognize this uniquely flattened haemal spine in individuals smaller than 60 millimeters would greatly assist in identifying small albacore and would represent a material advance in the ability to understand the life history of this interesting and important species.

Note: See Commercial Fisheries Review, August 1962 pp. 17-18.

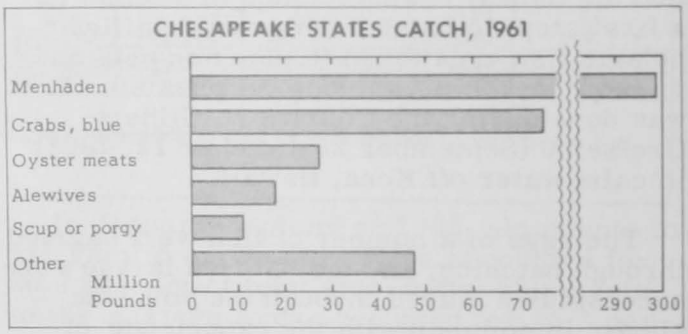
Chesapeake States

FISHERY LANDINGS, 1961:

During 1961, fish and shellfish landings in the Chesapeake States (Maryland and Virginia) totaled 478 million pounds valued at $37 million ex-vessel. This was an increase of 42 million pounds or 10 percent in quantity and $2.2 million or 6 percent in value as compared with the previous year.



The increase in quantity was largely due to menhaden landings which amounted to 298.7 million pounds--50 million pounds more than in 1960. The catch of hard blue crabs (70.6 million pounds) was the second highest on record, exceeded only by the 73.9 million pounds landed in 1950. Landings of striped bass reached 7.3 million pounds (up 575,000 pounds over 1960) and established a new record. There were also slight increases in the catches of butterfish, shad, sea trout, white perch, and oysters. Moderate decreases occurred in the catches of alewives, croaker, catfish and bullheads, fluke, scup, spot, clams, and sea scallops.



Virginia produced 411 million pounds (86 percent) valued at $24 million (66 percent) of the total landings in the Chesapeake States. The Maryland and Virginia catch was taken by 18,172 fishermen operating in 1,350 vessels of 5 net tons and over, 9,228 motorboats, and 1,019 other boats.

Manufactured fishery products of the Chesapeake States in 1961 were valued at $58.5 million--an increase of $3.4 million as compared with the previous year.

Federal Aid for Sport Fish and Wildlife Restoration

FUNDS APPORTIONED TO STATES, FISCAL YEAR 1963:

Distribution of $7,062,000 in additional funds to various states to provide better hunting and fishing for the Nation's sportsmen was announced on November 21, 1962, by the Secretary of the Interior. The money allocated under the Federal Aid in Fish and Wildlife Restoration programs, brings the total apportioned for the fiscal year ending June 30, 1963, to $19,170,000.

Funds come from Federal excise taxes on certain types of hunting and fishing equipment. Of the $19,170,000 apportioned for the year, $13,646,000 is for wildlife and $5,524,000 is for sport fisheries work.

The fiscal year's maximum for fish restoration is $276,200 and the minimum is $55,240. States receiving the maximum amount are Alaska, California, Minnesota, and Texas. Twelve received the minimum. The Federal Aid in Fish Restoration program started in 1952. The maximum that year was $128,745, and the minimum was $25,749.

The territorial areas of Guam, Puerto Rico, and the Virgin Islands each received $10,000 for their fisheries programs.

Federal Aid money is matched by states on the basis of not to exceed 75 percent Federal to 25 percent state funds. The Federal Aid to Fish and Wildlife Restoration programs are administered by the Department's Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service.

Apportionment for Federal Aid in Sport Fish Restoration, Fiscal Year 1963

States	Amount ($)
Alabama	96,066.62
Alaska	276,200.00
Arizona	103,964.92
Arkansas	94,133.12
California	276,200.00
Colorado	126,272.44
Connecticut	55,240.00
Delaware	55,240.00
Florida	126,850.80
Georgia	115,443.76
Hawaii	55,240.00
Idaho	90,342.22
Illinois	147,358.70
Indiana	133,346.72
Iowa	98,936.50
Kansas	98,910.19
Kentucky	76,451.22
Louisiana	55,240.00
Maine	56,334.17
Maryland	55,240.00
Massachusetts	55,240.00
Michigan	209,088.41
Minnesota	276,200.00
Mississippi	73,291.71
Missouri	145,937.81
Montana	128,779.83
Nebraska	80,604.92
Nevada	79,644.52
New Hampshire	55,240.00
New Jersey	55,240.00
New Mexico	97,536.80
New York	148,772.96
North Carolina	87,007.88
North Dakota	55,240.00
Ohio	151,094.00
Oklahoma	115,928.15
Oregon	127,767.22
Pennsylvania	121,977.59
Rhode Island	55,240.00
South Carolina	61,234.99
South Dakota	71,001.65
Tennessee	128,725.24
Texas	276,200.00
Utah	84,865.63
Vermont	55,240.00
Virginia	76,597.23
Washington	103,732.20
West Virginia	55,240.00
Wisconsin	209,699.92
Wyoming	88,619.96
TOTALS	$5,524,000.00

Note: See Commercial Fisheries Review, February 1962 p. 17.

Federal Purchases of Fishery Products

FISHERY PRODUCTS INCLUDED UNDER SANITARY APPROVAL PREREQUISITES FOR PROCUREMENT:

Fishery products are included in Headquarters Notice No. 134 (61) issued December 20, 1961, by the Defense Subsistence Supply Center (DSSC), Chicago, Ill., on Sanitary Approval Prerequisites for DSSC Procurement.

A later Notice to the Trade (No. 25-62), issued on October 19, 1962, by the Los Angeles Region, announces that effective January 1, 1963, offers submitted by those establishments which do not meet the sanitary approval criteria established by Notice 134 (61), will be declared nonresponsive by that Headquarters. This includes offers submitted by brokers or distributors on "Brand Name" items which did not originate from an approved source.

Headquarters Notice No. 134 (61) of December 20, 1961, stated that effective January 1, 1963, DSSC contracts for products other than those that were excepted, could be awarded only to firms whose establishments met certain criteria. The criteria for fishery products reads: "An establishment processing fish and other waterfoods under the continuous inspection supervision of the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, as officially listed by that service."

Fish Hatcheries

NATIONAL FISH HATCHERIES PRODUCE RECORD QUANTITY OF FISH IN 1961:

Over 3 million pounds of fish were produced in 1961 at the 101 National Fish Hatcheries operated by the U. S. Fish and Wildlife Service. Production was increased at both warm- and cold-water hatcheries. The National Hatcheries in 1961 reduced the factor for converting fish food to fish flesh to an all time low of 2.3 and increased fish production per man-year of employment to 6,695 pounds.

Fur Seals

FUR SEAL SKIN TAKE FROM PRIBILOF ISLANDS LOWER:

During the 1962 sealing season the production of fur seal skins by the Pribilof Islands staff of the U. S. Bureau of Commercial Fisheries amounted to 77,915 skins. Of that amount, 60,578 skins were harvested on St. Paul Island and 17,337 skins on St. Georges Island.

Breeding grounds of the northern fur seals.

The harvest in 1962 was lower by almost 20,000 skins from that for 1961. In 1961, the Bureau harvested more than the usual number of seals as part of a planned reduction in the herd.

Note: See Commercial Fisheries Review, March 1962, p. 34;

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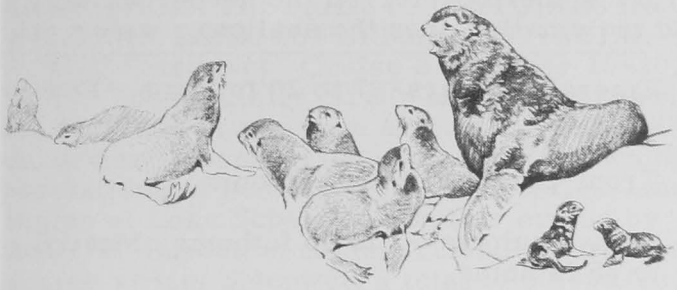
PRICES FOR ALASKA FUR SEAL SKINS SET RECORD AT FALL 1962 AUCTION:

The fall auction in 1962 (October 25-26) of United States Government-owned fur seal skins yielded close to $2.5 million. The average price per skin received for male fur seal skins (Black, Kitovi, and Matara) was $107.53, a new record price. This average price compares with an average of $106.42 paid at the spring 1962 auction, and was also higher than the $86.69 average for skins sold in the fall 1961 auction. In addition, the average price received for Lakoda or female sheared seal skins was $48.40 as compared with an average of $44.33 received at the spring 1962 auction and an average of $41.05 received at the fall 1961 auction.

Average prices per skin received for processed male fur seal skins at the fall 1962 auction were (average for spring auction in parentheses): Black, $115.99 ($108.88); Kitovi, $105.81 ($101.23); Matara, $99.04 ($107.66). Prices received at the fall 1962 auction for Japanese-owned fur seal skins as compared with the spring 1962 auction were: Black, $121.41 (up about 6.1 percent); Kitovi, $98.10 (down about 1.0 percent); Matara, $100.75 (down about 9.6 percent).



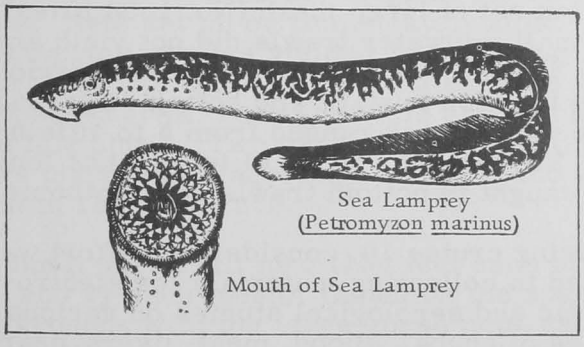
Fur seal skins sold in the October 1962 auction amounted to 19,851 conventionally processed male skins, 5,762 Lakoda or sheared female skins, and 337 low-quality natural-sheared skins.

Note: See Commercial Fisheries Review, July 1962 p. 19; December 1961 p. 29.

Great Lakes Fishery Investigations

ADULT SEA LAMPREY POPULATION DECLINES IN LAKE SUPERIOR AND LAKE MICHIGAN:

The network of assessment barriers operated by the U. S. Fish and Wildlife Service on Lake Superior and Lake Michigan streams to count the number of adult sea lampreys migrating to spawning grounds was closed July 13, 1962. Counts of lampreys at the 29 Lake Superior installations totaled 9,225 in 1962, as contrasted with counts at the same barriers in 1961 of 68,197. Barriers in three Lake Michigan streams took 8,089 lampreys in 1962, as compared with 12,886 in 1961. The reduction of adult lampreys in Lake Superior is believed to be the result of the chemical treatment of the tributary streams which was completed by the end of 1960.



Sea Lamprey (Petromyzon marinus)

Mouth of Sea Lamprey

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LAKE ERIE 1962 FISH POPULATION SURVEY COMPLETED:

M/V "Musky II" (October-November 1962): The Lake Erie fish population survey was continued during October and November 1962 by the U. S. Bureau of Commercial Fisheries research vessel Musky II. Despite frequent interruptions caused by bad weather, the fall 3 day-night series of trawl hauls was completed at 2 stations in the western basin. Supplemental data on length of fish near the end of the growing season were collected at several other localities. Field activities in November were directed primarily toward sampling of commercial catches at various south shore ports of Lake Erie.

The numbers and species of fish caught during the 3 day-night series of trawl hauls were similar at the two stations. The average 10-minute haul at Bono (station 49) produced 662 fish, of which 86 percent were young-of-the-year. At East Harbor (station 4), the catches averaged 715 fish per haul, and 92 percent were young-of-the-year. Yellow perch, spot-tail shiners, and emerald shiners dominated the catch in both areas. A total of 39 young yellow pike (walleye) were collected.

The average length in inches of young-of-the-year fish of various species collected in western Lake Erie in October 1962 were: yellow perch, 3.1; yellow pike, 9.1; white bass, 3.6; sheepshead, 4.4; smelt, 2.7; gizzard shad, 4.2; alewife, 4.6; spot-tail shiner, 2.9; trout-perch, 3.2; and emerald shiner, 2.7.

Surface water temperatures in the western basin of Lake Erie decreased sharply from about 60° F. at the beginning of October to 47° F. by the end of the month. Temperatures in Sandusky Bay were several degrees lower.

Sampling of the customary species of fish in the commercial catch was difficult due to

low fishing effort and poor catches. Scales were collected from 1,472 specimens. Only yellow perch were readily available, although modest numbers of yellow pike, white bass, and sheepshead were also sampled. A few ciscoes and whitefish, but no blue pike, were observed in the landings.

On November 12 the Musky II was placed in drydock for the winter. Data collected on the 1962 Lake Erie investigations is being compiled and analyzed.

Note: See Commercial Fisheries Review, December 1962 p. 36.

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LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 10 (October 30-November 11, 1962): To study fish distribution in southeastern Lake Michigan during the period of fall turnover was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Cisco. All operations were conducted off Saugatuck and Holland, Mich. Several days were lost during the cruise period because of high winds which are not uncommon in the Great Lakes during November.

During the latter part of the cruise the water was practically the same temperature out to a depth of about 35 fathoms; surface water temperatures ranged mostly between 50° to 52° F. Warm-water fish were found at appreciably greater depths than during the summer period of thermal stratification, when most were confined to depths of less than 10 or 12 fathoms. Chubs, which prefer colder water, were abundant at depths as shallow as 15 fathoms during the summer, but during this cruise were not abundant in water shallower than 40 fathoms. The depth distribution of different species of fish during cruise 10, on the basis of one or more bottom-trawl tows at 5, 7, 10, 15, 18, 20, 25, 30, 35, 40, and 45 fathoms, is summarized as follows:

Chubs (practically all Coregonus hoyi)--5 to 45 fathoms, but scarce inside 20 fathoms, and abundant only at 45 fathoms.

Lake herring--5 to 45 fathoms. Only a few were caught.

Yellow perch--7 to 30 fathoms, but few deeper than 20 fathoms. The largest concentrations were at 10 to 15 fathoms; catches varied somewhat from day to day. No young-of-the-year yellow perch were caught, and only a few yearlings.

Alewives--5 to 45 fathoms. Young-of-the-year were mostly at 7 to 20 fathoms, but others were uniformly distributed throughout the range of depths sampled.

Smelt (both young-of-the-year and older)--5 to 20 fathoms. There were no large catches.

Spot-tail shiners--5 to 20 fathoms. The larger shiners preferred the deeper water, and the smaller ones the shallower water.

Emerald shiners--7 to 20 fathoms. Few were caught.

Trout-perch--7 to 20 fathoms.

Slimy sculpins--7 to 45 fathoms. Mostly 30 to 35 fathoms.

Deepwater sculpins--35 to 45 fathoms. Abundant only at 45 fathoms.

Other species--a few johnny darters were caught at 5 to 20 fathoms, 2 longnose and 1 white sucker at 7 fathoms, a single 8.5-inch whitefish at 10 fathoms, and 1 logperch at 10 fathoms.

The catch in a nylon gill net of $1\frac{1}{4}$-inch mesh (stretched), set obliquely from surface to bottom in 26 fathoms, indicated that alewives were scattered vertically at all depths, but were most common in the upper 16 fathoms. The smaller alewives (probably yearlings) especially seemed to favor the upper strata. Chubs (Coregonus hoyi) were caught as near the surface as 5 fathoms, but were more common near the bottom. A few smelt were caught between the surface and a depth of 8 fathoms, but none deeper.

Experimental fishing with a 1-meter plankton net of large mesh (No. 1558 Nitex) and small midwater trawls did not yield any small chubs. The nets were towed at various levels between surface and bottom, in areas where water depth ranged from 5 to 40 fathoms. Three small chubs (4 to 5 inches long) were caught in bottom trawls at 15 fathoms.

During cruise 10, considerable effort was devoted to collecting materials for electrophoretic and serological studies on various species of chubs. Blood, meat, livers, hearts,

gill arches, and eye lenses were frozen for future use. A few live specimens were sent to the University of Michigan. Most of the material was from trawl catches, but some was from nylon gill nets (600 feet each of $2\frac{3}{8}$- and $2\frac{1}{2}$-inch mesh) set overnight at 40 fathoms. That set yielded chubs of the following species: 231 C. hoyi, 2 C. kiyi, 1 C. alpenae, 1 C. zenithicus. The same set also yielded 10 lake herring and 5 alewives.

Note: See Commercial Fisheries Review, December 1962 p. 36.

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LAKE TROUT DISTRIBUTION STUDIES IN WESTERN LAKE SUPERIOR CONTINUED:

M/V "Siscowet" Cruise 8 (October 10-30, 1962): Substantially larger numbers of spawning fish than at any time since 1959 were indicated in the annual assessment of spawning populations of lake trout in the Apostle Islands region of Lake Superior. On this cruise by the U. S. Bureau of Commercial Fisheries research vessel Siscowet, a total of 57,400 feet of large-mesh gill nets (5- to 6-inch mesh), fished at 9 locations, caught 99 spawning lake trout. All of the 78 fish (which were alive in the nets) were tagged and released. Only one lake trout had a fresh sea lamprey wound.

The lengths of the fish ranged from 21.6 to 30.1 inches (the average was 25.8 inches). The 3 females caught averaged 29.2 inches. The number of fish in each of the 6 age groups represented was: IV, 4; V, 18; VI, 28; VII, 37; VIII, 9; and IX, 2.

Since 10 percent of the lake trout larger than 25 inches in the Wisconsin lake trout assessment catches were fin-clipped, it was expected that some of those hatchery-reared fish would be caught on the spawning reefs later in the fall of 1962. The complete absence of fin-clipped lake trout from catches on the outlying spawning grounds (Gull Island Shoal, Michigan Island) led to speculation that the mature hatchery-reared fish may return to spawn near the original planting sites. Nets set on or immediately adjacent to the planting sites yielded 14 spawning lake trout. Of those, 4 ripe males were fin-clipped--2 at SE. Basswood Isle and 2 at Manitou Isle Shoal. Two of the fin-clipped fish were planted as fingerlings in 1956, and one each in 1955 and 1958.

Small-mesh gill nets (150 feet each of $1\frac{1}{2}$- and $2\frac{1}{2}$-inch mesh), fished on the spawning grounds with the large-mesh nets, caught predominately longnose suckers and round whitefish. No fish eggs were found in the stomachs of about 175 suckers and 50 round whitefish.

A limited amount of reef fishing was conducted in Michigan waters at Pine River Shoal, Point Abbaye, Point Isabelle, and Keweenaw Point by commercial fishermen under contract with the U. S. Bureau of Commercial Fisheries. Approximately 5,000 feet of large-mesh gill nets ($4\frac{5}{8}$- to 6-inch mesh) were fished at each location. Only 3 spawning lake trout (all males) were caught--1 at Point Isabelle and 2 at Point Abbaye. Gale-force winds during the spawning season prevented adequate coverage of those reefs and other Michigan spawning reefs.

Note: See Commercial Fisheries Review, December 1962 p. 37.

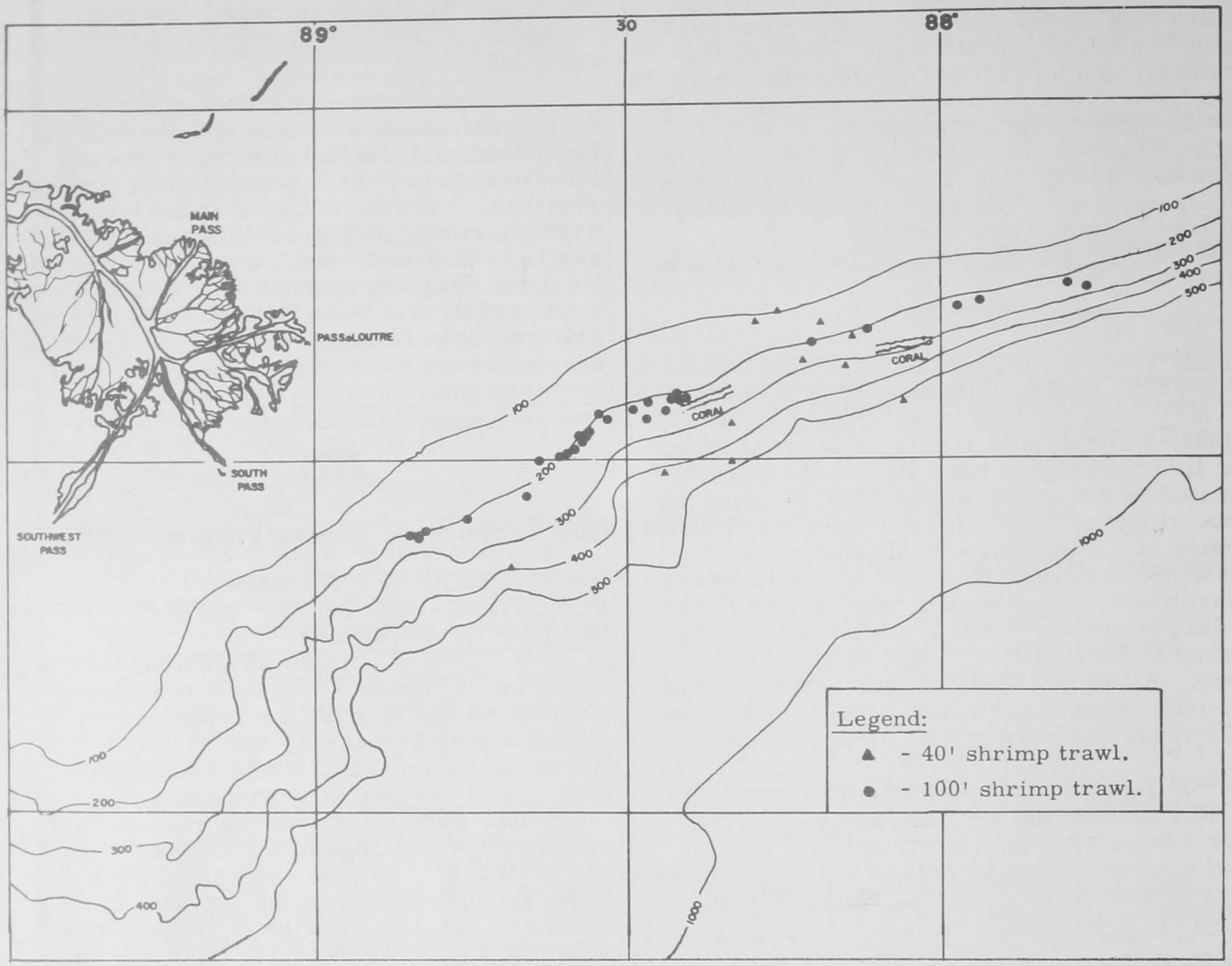
Gulf Exploratory Fishery Program

PRODUCTION-TYPE FISHING FOR ROYAL-RED SHRIMP TRIED IN GULF OF MEXICO:

M/V "Oregon" Cruise 82 (October 22-November 4, 1962): The royal-red shrimp grounds off the Mississippi Delta were explored during this 14-day trip by the U. S. Bureau of Commercial Fisheries exploratory vessel Oregon. The three objectives of the cruise were to: (1) extend seasonal production-type coverage to the October-November period, (2) continue systematic studies of faunal distribution on the upper Continental Slopes, through a series of shrimp trawl drags on a transect reaching from 100 to 1,000 fathoms across the royal-red shrimp grounds, and (3) obtain samples of the small deep-water shrimp (Penaeopsis megalops) for commercial canning experiments.

Production-type fishing for royal-red shrimp (Hymenopenaeus robustus) was conducted with a 100-foot flat trawl held open by 12-foot doors. Heaviest concentrations were again found between 195 and 210 fathoms, with catches falling off rapidly both deeper and shallower. A total of 20 drags lasting 3 hours each were made in that depth range. Gear fouling or shark damage occurred on 4 drags. Catches from the 16 successful drags ranged from 165 to 355 pounds of heads-on royal-red shrimp per drag for a total of 3,890 pounds. The shrimp graded 87 percent 31-35 count (heads-off), and 13 percent 36-42 count.

Three drags in 210 to 230 fathoms yielded somewhat lower catches of 60 to 155 pounds



Shows the station pattern for Cruise 82 of the M/V Oregon (October 22-November 4, 1962).

for an average of 118 pounds of heads-on royal red shrimp. Six drags in 180 to 195 fathoms yielded catches of 1 to 40 pounds for an average of only 15 pounds per drag.

A 350-pound sample of small deep-water shrimp was caught for canning tests. Concentrations of these were light.

A series of northers curtailed operations before the shrimp trawl transect was complete, after 11 drags had been made with a 40-foot flat trawl in depths grading downward from 100 to 500 fathoms. Predominant fish in the depth range worked were hake (Urophycis sp.), whiting (Merluccius sp.), and macrourids.

A 12-foot six-gilled cow shark (Hexanchus griseus), weighing an estimated 2,200 pounds was caught during the cruise. It was the first time on record that this species was caught in the Gulf of Mexico.

Note: See Commercial Fisheries Review, November 1962 p. 25, October 1962 p. 19.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas" Cruise BT-31 (November 11-23, 1962): Catches of brown shrimp off Freeport and Aransas Pass, Tex., were good on this cruise by the Belle of Texas, operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico. A 45-foot shrimp trawl

was used at all stations, and one 3-hour tow was made in each of the 3 depth ranges in each statistical area.

Of the 4 statistical areas worked by the research vessel, area 18 yielded the largest shrimp catch--a total of 73 pounds from 2 depth ranges, most of which were brown shrimp counting 15-20 to the pound from the 20-40 fathom depth range. The largest catch of white shrimp (13 pounds of 26-30 count) made during the trip was from 0-20 fathoms of the same area.

A total catch of 62 pounds from area 20 was made up of 49 pounds of 26-30 count brown shrimp from the 0-20 fathom depth, and small amounts of brown shrimp counting 12-20 to the pound from the other depth ranges. A scattering of white and pink shrimp were caught in the shallower depths of the same area.

The largest catch of 12-15 count brown shrimp made on this trip was 23 pounds from 20-40 fathoms of area 21. The up to 20 fathom depth of that area yielded about 25 pounds, mostly all brown shrimp of 31-40 count to the pound. The 40-60 fathom depth yielded less than one pound of 12-15 count brown shrimp.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, December 1962 p. 42.

Hawaii

COMMERCIAL FISHERY LANDINGS, JULY 1961-JUNE 1962:

Landings of sea and pond fish in the State of Hawaii in the fiscal year July 1, 1961-June 30, 1962, amounted to 13.9 million pounds valued at $2.9 million reported for the ing to the Hawaiian Division of Fish and Game. The fiscal year 1962 over-all landings were very close to the 13.7 million pounds valued at $2.9 million report for the preceding fiscal year. As in the past years, the commercial landings were made up largely of tuna and tuna-like fishes. These tuna and tuna-like species accounted for 85.5 percent of total volume and about 69.2 percent of the total value in fiscal year 1962. The landings in this fiscal year other than tuna and tuna-like fishes were made of numerous species with the swordfishes and related species accounting for about 4.1 percent of the total value and 5.3 percent of the total value.

Table 1 - Hawaiian Commercial Fishery Landings and Ex-Vessel Value, July 1961-June 1962

Species		Quantity	Value
English Name	Hawaiian Name	1,000 Lbs.	$1,000
Ocean Catch:			
Amberjack	Kahala	69	21
Big-Eyed Scad	Akule & Hahalalu	244	165
Crevalles	Ulua, Omilu	76	33
Dolphin	Mahimahi	109	47
Goatfishes	Weke-ula, Weke Moelua, Moano Kumu, Malu	111	59
Mackerel	Opelu	221	89
Snappers:			
Gray	Uku	56	22
Pink	Opakapaka, Kalekale	123	59
Red	Ulaula Koae, Ehu or Ulaula	68	60
Swordfishes, Spearfishes, & Marlins		579	151
Tuna & Tunalike fishes:			
Albacore	Ahipalaha (tonbo)	16	5
Big-Eyed		1,182	579
Yellowfin	Ahi	385	142
Skipjack	Aku	10,319	1,261
Bonito or little tuna	Kawakawa	3	1/
Shellfish:			
Crabs	Kuahuhu, Koni, Papai, Muala	34	23
Limpet	Opihi	7	4
Lobster, spiny	Ula	10	7
Octopus	Hee	3	2
Squid	Muhee	9	4
Other fish & shellfish		246	92
Total Ocean Catch		13,870	2,825
Pond Catch		61	48
Grand Total		13,931	2,873

1/Less than $500.

The Island of Oahu in the fiscal year ending June 30, 1962, accounted for 10.4 million pounds (valued at $2.2 million) or about 76 percent of the quantity and 75 percent of the value. The Island of Hawaii was the second most important center of the State's fishing industry and accounted for about 14 percent of both the total landings and value. The only other Island of the six reporting landings of over one million pounds was that of Maui Island.

Table 2 - Hawaiian Commercial Fishery Landings by Islands, July, 1961 - June, 1962

Island	Sea Catch		Pond Catch		Total Catch	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000
Hawaii	1,976	409	-	-	1,976	409
Maui	1,332	200	-	-	1,332	200
Lanai	14	5	-	-	14	5
Molokai	5	4	1	1	6	5
Oahu	10,380	2,139	60	47	10,440	2,186
Kauai	163	68	-	-	163	68
Total	13,870	2,825	61	48	13,931	2,873

Table 3 - Hawaiian Commercial Fishery Landings by Months, July 1961 - June 1962

Month	Sea Catch		Pond Catch		Total Catch	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000
1961						
July	2,587	367	5	5	2,592	372
August	1,649	274	3	2	1,652	276
September	970	203	4	3	974	206
October	777	186	6	4	783	190
November	486	168	7	6	493	174
December	634	246	10	9	644	255
1962						
January	628	154	9	9	637	163
February	645	174	4	3	649	177
March	498	187	5	3	503	190
April	810	194	3	2	813	196
May	1,531	284	2	1	1,533	285
June	2,656	389	2	1	2,658	390
Total....	13,871	2,826	60	48	13,931	2,874

Note: Due to rounding, totals in Tables 2 and 3 do not agree in some cases.

As in previous years the months of May-August of this fiscal year were responsible for the bulk of the total landings. In the fiscal year ending June 1962, the months of May-August accounted for about 61 percent of the total landings of fish and shellfish. The landings in June 1962 amounted to about 2.7 million pounds or close to 19.1 percent of the total volume. Landings of pond fish in 1962 fiscal year were confined largely to the late fall and winter months, with about one-third of the total pond catch reported in the months of December and January.

Note: See Commercial Fisheries Review, December 1961 pp. 37 and 38.

Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES: Production, January-October 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for October 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production[1/] of Fish Meal, Oil, and Solubles, October 1962 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles	Homogenized[3/]
	Short Tons	1,000 Gallons	. . (Short Tons) . .	
October 1962:				
East & Gulf Coasts	34,042	5,103	11,106	850
West Coast[2/]	2,860	96	1,764	-
Total	36,902	5,199	12,870	850
Jan.-Oct. 1962 Tot.	275,242	31,485	[4/] 105,893	8,915
Jan.-Oct. 1961 Tot.	265,497	30,522	89,534	10,487

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes Hawaii, American Samoa, and Puerto Rico.
3/Includes condensed fish.
4/Previous cumulative totals have been revised.

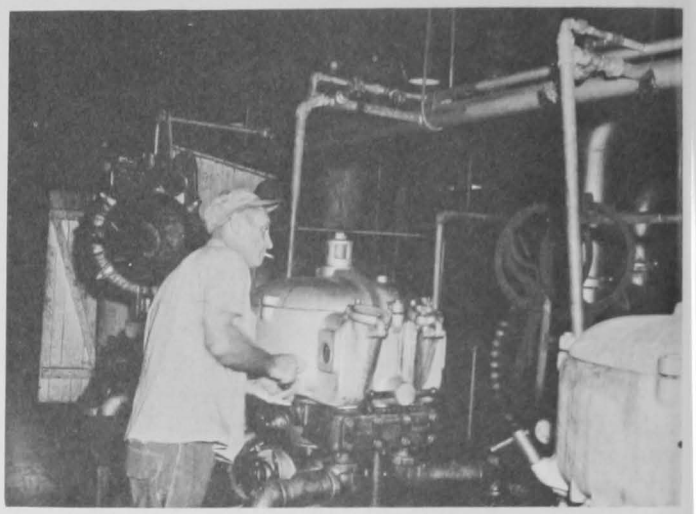


Fig. 1 - In fish meal plants after each day's operations, the centrifuges are disassembled, cleaned, and reassembled.

During October 1962, a total of 36,600 tons of fish meal and scrap and 5.1 million gallons of marine-animal oils were produced in the United States. Compared with October 1961, this was an increase of 20,400 tons or 126 percent in meal and scrap production and 3 million gallons or 146 percent in oil.

Menhaden meal amounted to 32,500 tons--accounting for 89 percent of the October 1962 meal total. Oil from menhaden (nearly 5 million gallons) comprised 98 percent of the October 1961 oil production.

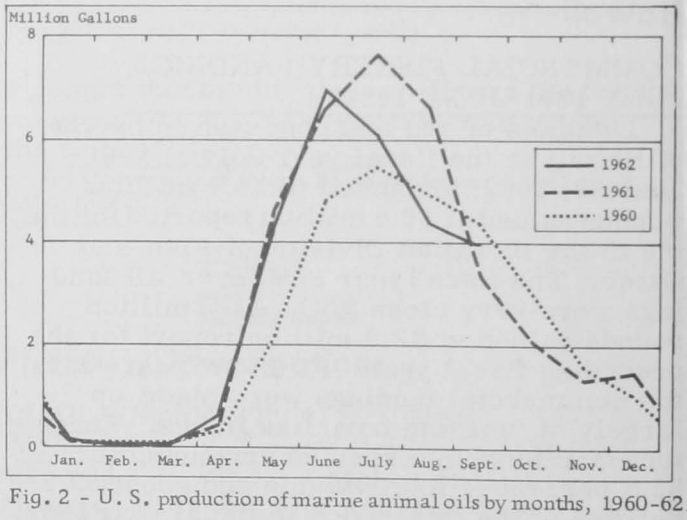


Fig. 2 - U. S. production of marine animal oils by months, 1960-62.

There were 14,200 tons of fish solubles produced in October 1962--6,700 tons above the same month of the previous year. There were 850 tons of homogenized condensed fish produced in October 1962 as compared with 1,000 tons in the same month in 1961.

U.S. Production of Fish Meal, Oil, and Solubles, October 1962 with Comparisons

Product	October		Jan.-Oct.		Total
	1/1962	1961	1/1962	1961	1961
	(Short Tons)				
Fish Meal and Scrap:					
Herring	482	106	3,533	5,093	5,268
Menhaden 2/	32,545	13,254	235,411	231,345	247,551
Sardine, Pacific	16	483	730	1,171	2,518
Tuna and mackerel	2,074	1,775	17,170	17,191	21,243
Unclassified	1,497	611	18,110	13,703	14,757
Total	36,614	16,229	274,954	268,503	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	14,160	7,461	107,190	91,760	100,551
Homogenized condensed fish	850	998	10,465	10,405	11,690
	(Gallons)				
Oil, body:					
Herring	37,000	6,000	647,180	807,547	818,017
Menhaden 2/	4,990,657	1,753,998	29,485,855	28,778,982	31,355,570
Sardine, Pacific	1,400	17,549	22,639	40,400	86,167
Tuna and mackerel	56,591	101,715	519,613	586,860	762,509
Other (including whale)	19,287	193,582	715,118	1,335,522	1,386,542
Total oil	5,104,935	2,072,844	31,390,405	31,549,311	34,408,805

1/Preliminary data.
2/Includes a small quantity produced from thread herring.
3/Not available on a monthly basis.

During the first 10 months of 1962, domestic meal and scrap production totaled 275,000 tons--6,500 tons above the same period of 1961. The marine-animal oil yield totaled 31.4 million gallons--a decrease of 159,000 gallons as compared with the same period in 1961.

* * * * *

Major Indicators for U. S. Supply, November 1962: For the first eleven months

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, November 1962

Item and Period	1962	1961	1960	1959	1958
	(Short Tons)				
Fish Meal:					
Production 1/:					
December	-	12,750	9,185	14,381	14,636
November	11,756	10,058	8,725	10,791	9,749
October	36,614	16,852	24,455	22,026	11,630
Jan.-Sept.	238,340	248,645	216,425	227,963	177,600
Jan.-Dec. prelim. totals 2/	-	289,039	257,969	275,396	216,510
Jan.-Dec. final tots.	-	311,265	290,137	306,551	248,140
Imports:					
December	-	23,268	15,564	5,508	8,490
November	-	25,649	6,149	3,673	6,082
October	12,732	9,425	12,515	3,821	5,899
September	13,698	13,941	9,487	9,224	5,079
Jan.-Aug.	194,996	145,562	87,846	110,699	74,802
Jan.-Dec.	-	217,845	131,561	132,925	100,352

(Table continued on next column)

Major Indicatiors for U. S. Supply of Fish Meal, Solubles, and Oil, November 1962 (Contd.)

Item and Period	1962	1961	1960	1959	1958
	(Short Tons)				
Fish Solubles:					
Production 3/:					
December	-	4,936	2,897	5,429	6,305
November	4,974	5,140	3,524	4,628	8,888
October	15,010	8,459	7,192	12,487	8,867
Jan.-Sept.	102,645	93,886	85,316	142,815	106,117
Jan.-Dec. totals	-	112,254	98,929	165,359	130,177
Imports:					
December	-	472	60	420	5,180
November	-	3,649	282	3,089	867
October	290	110	-	1,908	2,548
September	178	263	38	1,732	253
Jan.-Aug.	5,018	2,245	2,794	19,481	5,719
Jan.-Dec. totals	-	6,739	3,174	26,630	14,567
	(1,000 Gallons)				
Fish Body Oils:					
Production:					
December	-	1,488	1,038	1,865	1,839
November	1,023	1,360	1,202	1,147	1,028
October	5,104	1,901	3,024	2,176	1,139
Jan.-Sept.	26,285	28,620	21,422	19,170	17,416
Jan.-Dec. prelim. totals 4/	-	33,471	26,690	24,418	21,625
Jan.-Dec. final tots.	-	34,409	27,853	24,945	21,977
Exports:					
December	-	1,398	2,108	2,611	383
November	-	190	1,952	813	2,037
October	26	2,027	591	1,911	3,591
September	29	1,269	1,861	1,129	665
Jan.-Aug.	12,828	11,447	12,643	12,800	5,863
Jan.-Dec.	-	16,331	19,154	19,264	12,539

1/Does not include crab meat, shrimp, and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
Note: Data for 1962 and 1961 are preliminary.

of 1962, United States fish meal and fish oil production was higher by 4.0 percent and 1.6 percent, respectively, as compared with the same period of 1961. Fish solubles production increased 13.5 percent.

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-September 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 9 months of 1962

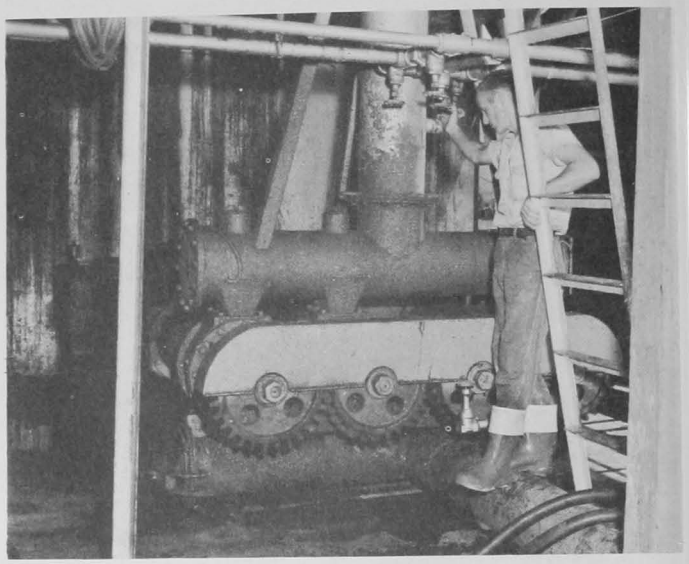
U. S. Supply of Fish Meal and Solubles, Jan.-Sept. 1961-62 and Total for 1961

Item	Jan.-Sept.		Total
	1/1962	1961	1961
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	202,866	218,091	247,551
Tuna and mackerel	15,096	15,416	21,243
Herring	3,051	4,987	5,268
Other	17,327	13,780	37,203
Total production	238,340	252,274	311,265
Imports:			
Canada	33,818	31,194	38,218
Peru	156,111	104,885	151,439
Chile	8,255	10,078	12,074
Angola	-	1,543	1,543
So. Africa Republic	9,584	10,526	13,026
Other Countries	926	1,277	1,545
Total imports	208,694	159,503	217,845
Available fish meal supply	447,034	411,777	529,110
Fish Solubles:			
Domestic production 2/	101,088	93,706	112,241
Imports:			
Canada	1,196	859	1,001
So. Africa Republic	1,192	1,097	1,351
Other Countries	2,808	552	4,387
Total imports	5,196	2,508	6,739
Available fish solubles supply	106,284	96,214	118,980

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

was 35,257 short tons or 8.6 percent greater than during the same period of 1961. Domestic production was 13,934 tons or 5.5 percent lower, but imports were 49,191 tons or 30.8 percent greater than in the same 9 months of 1961. Peru continued to lead other countries with shipments of 156,111 tons during the first 9 months of 1962--51,226 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.



At a reduction plant at Moss Point, Miss., a large fish pump is used to unload the fish from the vessel hold and transport it to the plant. Such a pump can empty a hold of 500,000 menhaden in less than an hour.

The United States supply of fish solubles (including homogenized fish) during January-September 1962 was 10,070 tons more than during the same period in 1961. Domestic production increased 7.9 percent, but imports jumped 107.2 percent.

* * * * *

Production and Imports, January-October 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 10 months of 1962 was 58,949 short tons (or 13.5 percent) greater than during the same period of 1961. Domestic production was 6,451 tons (or 2.4 percent) greater and imports were 52,498 tons (or 31.1 percent) greater than in the same 10 months of 1961. Peru continued to lead other countries with shipments of 164,573 tons during the first 10 months of 1962--53,528 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-October 1962 was 18,358 tons more than during the same period in 1961. Domestic production increased 15.2 percent, but imports jumped 109.5 percent.

U. S. Supply of Fish Meal and Solubles, Jan.-Oct. 1961-62 and Total for 1961

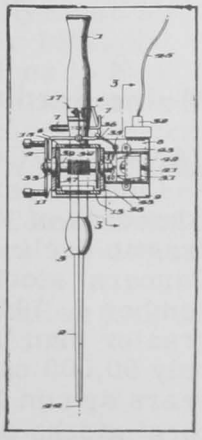
Item	Jan.-Oct.		Total
	1/ 1962	1961	1961
	.....(Short Tons).....		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	235,411	231,345	247,551
Tuna and mackerel	17,170	17,191	21,243
Herring	3,533	5,093	5,268
Other	18,840	14,874	37,203
Total production	274,954	268,503	311,265
Imports:			
Canada	37,568	33,559	38,218
Peru	164,573	111,045	151,439
Chile	8,255	10,078	12,074
Angola	-	1,543	1,543
So. Africa Republic	9,884	11,376	13,026
Other Countries	1,146	1,327	1,545
Total imports	221,426	168,928	217,845
Available fish meal supply	496,380	437,431	529,110
Fish Solubles:			
Domestic production 2/	117,655	102,165	112,241
Imports:			
Canada	1,236	880	1,001
So. Africa Republic	1,442	1,097	1,351
Other Countries	2,808	641	4,387
Total imports	5,486	2,618	6,739
Available fish solubles supply	123,141	104,783	118,980

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

Inventions

NEW ELECTRICALLY OPERATED FISHING REEL WITH BRAKE PATENTED:

A new fishing reel can be electrically or manually driven. The reel rotates as long as a fish attracted by a moving lure does not start to bite, according to the inventor. In order to ease the casting of the fishing line and reduce energy losses, the friction in the inner system has been minimized through elimination of gears, use of ball bearings, and selective coupling and uncoupling of the electric motor. It has a special mechanical brake. In order to protect the motor from shock, the mechanical brake automatically shuts off the current before it starts to function. (Patent Number 3,030,046, U. S. Patent Office Classification Number 242-84.53, granted April 17, 1962, to Leo Markoff-Maghadam, 2938 Newark St., NW., Washington 8, D. C.)



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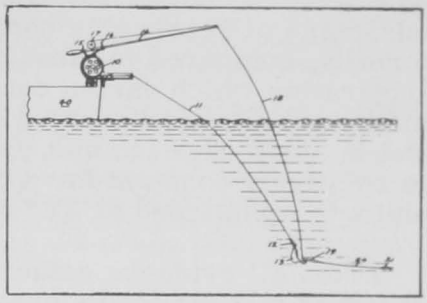
NEW HAND WINCH ATTACHMENT FOR TROLLING TACKLE PATENTED:

The inventor of a new hand winch attachment for a trolling rod and reel claims his device will take in fishing line faster than the fishing reel. The winch lowers and retrieves to depths of 300 feet and over by increments as small as $\frac{9}{16}$ inch. By using the winch and a double-line arrangement, a fisherman can play a fish without the encumberance of a sinker. The line from the rod and reel runs freely through a loop in a weighted line attached to the winch. The winch can be operated by one hand. It includes an adjustable rod holder and can be rapidly attached or removed from any fishing station on a boat. (Patent Number 2,786,296, U. S. Patent Office Classification Number 43-43.12, granted Harry A. Loebensteen, 165 San Felipe Ave., San Francisco 27, Calif.)



Irradiation Preservation

ICED STORAGE LIFE OF SHRIMP EXTENDED BY LOW-DOSAGE PASTEURIZATION:

The iced storage life of shrimp was increased by at least two weeks over untreated controls by experiments of low-dose radiation pasteurization (50,000 to 100,000 rads 1/). Those were the partial results of a research project on radiation pasteurization of shrimp conducted by the Louisiana State University, Baton Rouge, La.

Experiments showed that when shrimp are caught under supervision and irradiated within 12 hours, the two-week period can be extended for an additional week. In one in-

1/Rad - the quantity of ionizing radiation which results in the absorption of 100 ergs per gram of irradiated material at the point of interest.
Erg - unit of energy.

stance, a sample irradiated at 100,000 rads and maintained in crushed ice was organoleptically acceptable and had a good odor and appearance after seven weeks, as compared to the unirradiated control which had a putrid odor and was spoiled after three weeks, even though it was stored under the same conditions.

Shrimp irradiated at 50,000 rads and stored at 36°-40° F. were organoleptically acceptable for only one week longer than the unirradiated control. Iced storage has the advantage of reasonable constancy and uniformity, compared to most commercial refrigeration which varies considerably for different units, and areas within the units. But the refrigeration unit used in the studies is relatively constant for a commercial unit and was maintained at 37°-39° F.

From all evidence gathered so far, it is apparent that the iced storage life of shrimp can be increased successfully by low-dose radiation, and that the dose range necessary to give maximum protection with a minimum of undesirable chemical and physical changes is 50,000 to 100,000 rads. At that dose level, organoleptic and chemical results were consistently better than the unirradiated samples. Tests include pH, indole, trimethylamine, ammonia, phenol red, and the picric acid test.

The procedures used for obtaining fresh shrimp, such as the method of handling and storing, and the time of holding prior to irradiation, are significant factors in ascertaining the keeping qualities after irradiation. The quality of shrimp is not improved by radiation pasteurization, and it should be understood that only products of high initial quality can be preserved successfully. When those methods are used commercially, shrimp of inferior grade or those which have been out of the water for several days should be sold locally as soon as possible, and should not be subjected to irradiation treatment.

Note: See Commercial Fisheries Review, October 1962.

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RESEARCH ON IRRADIATED FISHERY PRODUCTS SHOWS PROMISE:

In cooperation with the Atomic Energy Commission, the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass., is conducting studies on low-level radiation of soft-shell clam meats and haddock fillets. The purpose is to determine if pasteurization doses of radiation will extend the refrigerated shelf life of those products without changing their normal, fresh flavor and odor.

Fresh clams can now be kept in the refrigerated state for only about five days. Haddock can be kept in the chilled state for only about twelve days; and, even though this fish can be frozen satisfactorily, there is still a high demand for it in the fresh state. An extension of the fresh, unfrozen shelf life of those products may open up new markets for them in cities far from producing areas.

The Laboratory's findings indicate that radiation-pasteurization will significantly increase the shelf life of clams and haddock. Soft-shell clam meats packaged in cans and irradiated at a level of 450,000 rads were acceptable quality after 30 days of storage at 33° F. Haddock fillets that were irradiated at a level of 250,000 rads could also be kept for 30 days at a temperature of 33° F. No irradiated flavors and odors were imparted to those products; but, if the storage temperature was increased to 42° F., then a reduction of about 50 percent of the shelf life resulted.

In addition to the above, the Laboratory investigated the stability of amino acids and B-vitamins in both irradiated clams and haddock. Little or no change resulted in those nutrients because of the use of radiation.

The laboratory tests indicate that radiation-pasteurization offers promise as a new method of preserving fishery products.

Note: See Commercial Fisheries Review, October 1962 p. 25.

Maine Sardines

CANNED STOCKS, NOVEMBER 1, 1962:

Current canned stocks reflect the 1962 comeback of the Maine sardine after the drastic decline in the catch and pack in 1961. Canners' stocks of Maine sardines on November 1, 1962, were over 1.1 million cases greater than those of November 1, 1961, but only 90,000 cases above stocks on hand two years ago on November 1, 1960. Distributors' stocks of canned Maine sardines were up 13.9 percent from stocks on hand Novem-

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1962, with Comparisons[1/]

Type	Unit	1962/63 Season	1961/62 Season					1960/61 Season				
		11/1/62	7/1/62	6/1/62	4/1/62	1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60
Distributors	1,000 actual cases	230	134	99	148	193	202	208	215	267	233	277
Canners	1,000 std. cases[2/]	1,348	374	50	45	144	221	201	294	506	1,029	1,258

1/Table represents marketing season from November 1-October 31.
2/100 3¾-oz. cans equal one standard case.

ber 1, 1961, but down 17.0 percent from those on hand November 1, 1960.

The 1962 season pack totaled 2,073,100 standard cases on November 1, 1962, and on November 24, 1962, the pack was virtually complete at 2,115,000 cases, according to the Maine Sardine Council. On April 15, 1962, carryover stocks at the canners' level amounted to about 33,000 cases. Adding the pack as of November 1, 1962, results in a total supply of 2,106,100 cases as of that date--up 93.8 percent from the total supply reported November 1, 1961, but down 7.7 percent from the total supply on November 1, 1960.

Table 2 - Canned Maine Sardines--Season Supply as of November 1, 1962, with Comparisons

Item	1962	1961	1960
	(Std. Cases[1/])		
Canners' carryover stocks on April 15[2/]	33,000	457,000	313,000
Season pack to Nov. 1[2/]	2,073,100	630,000	1,970,000
Total supply as of Nov. 1	2,106,100	1,087,000	2,283,000

1/100 3¾-oz. cans equal one standard case.
2/The usual legal packing season in Maine, extending from April 15 to Dec. 1, was in effect during the 1960 and 1961 season. The 1962 season was extended to 13 months--Dec. 2, 1961-Jan. 1, 1963--but the 1962 pack canned before April 15 was insignificant.

The Maine Sardine Council reported November 24, 1962, that present inventories are considered normal and that the industry is making an impressive comeback in regaining domestic consumer markets lost to imports as a result of the critically small Maine pack in 1961. In mid-November 1962, the wholesale price of Maine sardines in New York was $9.31 a case, down 24 percent from the average price of $12.31 a case in November 1961, but up 9.5 percent from the average price of $8.50 a case in November 1960, according to the U. S. Bureau of Commercial Fisheries, Fishery Market News Service at New York City.

Note: See Commercial Fisheries Review, Sept. 1962 p. 33, Jan. 1962 p. 23.

Market News Service

QUARTER OF A CENTURY OF SERVICE TO FISHERY INDUSTRY COMPLETED:

The Fishery Market News Service of the U. S. Bureau of Commercial Fisheries in December 1962 completed a quarter of a century of providing fish prices and other up-to-date information to the fishing industry of the United States.

Through daily reports in seven important fishery centers of this country, the Fishery Market News Service places the buyer and the seller on an even footing regarding market information, and the distributor is kept advised on market activity. The Market News Service reports are issued from Boston (Mass.), New York City, Chicago (Ill.), Seattle (Wash.), San Pedro (Calif.), New Orleans (La.), and Hampton (Va.).

Fig. 1 - Fishery Market News Reporter on the Seattle waterfront collecting data on receipts and prices. In the upper right hand corner is a netload of halibut being hoisted from the hold of a fishing vessel to the dock.

The first report was issued December 19, 1937, from New York City only. During the years the service expanded to the six other cities.

The Fishery Market News Service, often called "the eyes and the ears of the fishing industry," is under the Bureau of Commercial Fisheries, Fish and Wildlife Service. Market information is released not only within a specific area, but pertinent facts are relayed to the other key cities and areas. In this way a fisherman landing halibut in Seattle knows the wholesale price that fish is bringing that day in New York City or Chicago or other cities. In the same way, distributors are fully aware of what landings are being made, what species, as well as the prices paid in all parts of the country.

In this way the shrimp fisherman in the Gulf area knows the prices being paid for shrimp in New York City, Chicago, and Los Angeles; Boston fishermen know what frozen fillets are bringing in the major markets throughout the country. With this complete information, business transactions relating to fish and fishery products can be conducted with

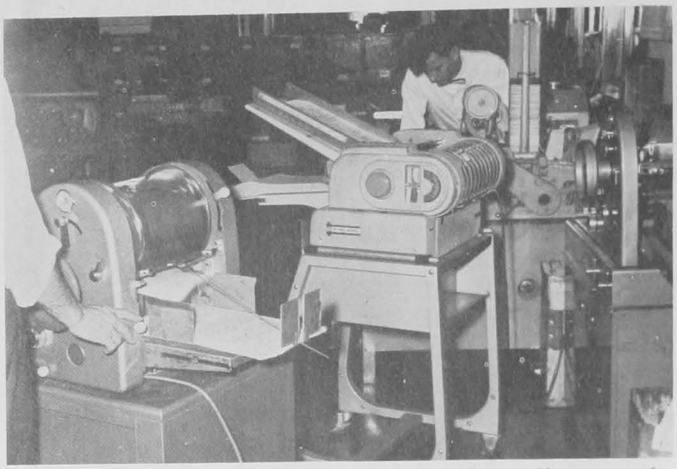


Fig. 2 - Typical scene in a Fishery Market News Office towards the end of the day. The daily "Fishery Products Reports" are mimeographed, folded, addressed, and mailed.

each interested party having current and authentic data on the condition of the market in other cities, the supply, the daily landings, and the prices.

The market information is made available to the public through daily mimeographed reports called "Fishery Products Reports," by telephone, personal contact, collect telegrams or teletype, and in some instances through radio and newspapers. Each office issues its own daily report, which is designed to meet the needs of the fishery industries in its area.

There are about 10,500 subscribers to the daily mimeographed reports. Most of them are persons interested in daily market transactions for fishery products. Reports sometimes are used as the basis for "open-end" contracts in which the seller and buyer agree that the price of a shipment will be the highest paid for that product at a designated market on the day of delivery.

The mailing lists include fisheries people, lawyers, research analysts, investment analysts, marine firms, transportation companies, chemical companies, gear manufacturers, banks, and many others.

Michigan

RECORD NUMBER OF LAKE TROUT EGGS COLLECTED AT HATCHERIES:

A record 6.5 million "green" lake trout eggs were collected in the fall of 1962 at the Michigan Conservation Department's Marquette and Harrietta Hatcheries, keeping Michigan in pace with plans for accelerated fish plantings in the upper Great Lakes.

Most of the fish raised from the eggs will be released in Lake Superior and possibly in the upper reaches of Lakes Michigan and Huron in 1964. However, 120,000 lake trout will be reared from the eggs for release in Michigan's inland lakes during 1964.

The Great Lakes plantings will follow up intensive sea lamprey control efforts which have produced impressive signs of success in Lake Superior and its tributaries.

More than 5 million lake trout have been released in the upper Great Lakes (mostly Lake Superior) since 1959 when the lake trout rehabilitation program was set into motion under the direction of the Great Lakes Fishery Commission.

Long-range plans of the Commission call for stepping up the plantings to about 7 million lake trout a year as soon as the sea lamprey problem is solved.

Note: See Commercial Fisheries Review, December 1962 p. 46, July 1962 p. 28.

North Atlantic Fisheries

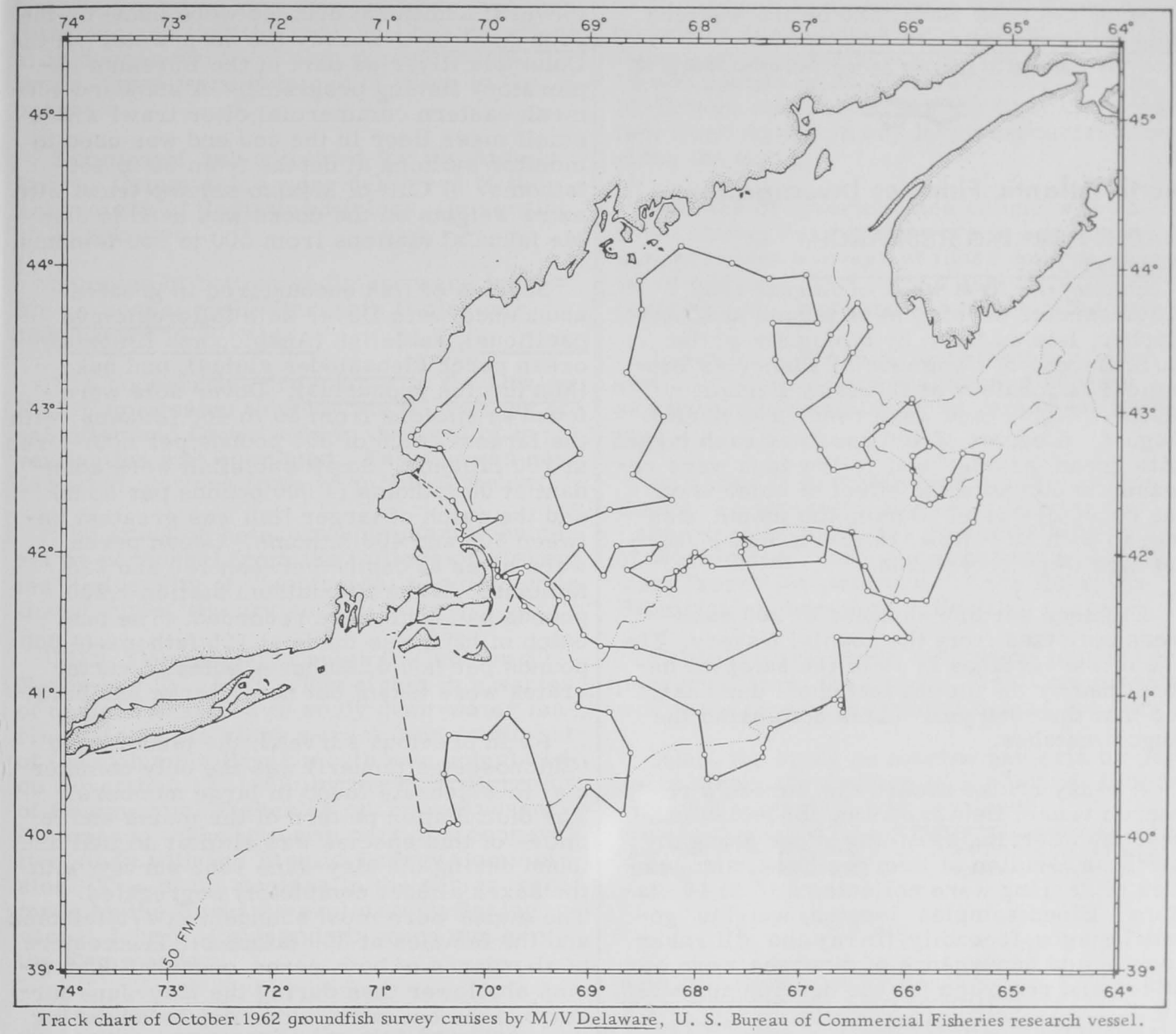
Exploration and Gear Research

DISTRIBUTION AND ABUNDANCE STUDIES OF YOUNG-OF-THE-YEAR HADDOCK AND OTHER GROUNDFISH CONTINUED:

M/V "Delaware" Cruise 62-12 (October 9-20, 1962): To determine the distribution and abundance of young-of-the-year haddock and other groundfish species was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. This trip was the first part of a 26-day survey cruise with the area of investigation confined to the inshore waters along the Massachusetts and Maine coasts, the Gulf of Maine, western Nova Scotia, Browns Bank, and the northern edge of Georges Bank.

Trawling operations during Cruise 62-12 were conducted at 90 fishing stations using a No. 36 otter trawl, with the cod end and upper belly lined with $\frac{3}{4}$-inch mesh netting. Bathythermograph casts were made at all stations and every 10 miles between stations. Seabed drifters were released at selected stations. All species of fish were counted and measured. Special collections of fish, invertebrates, haddock blood, blood samples from other groundfish species, and whiting stomachs were made throughout the cruise.

The number of young-of-the-year haddock caught in each area worked was as follows: inshore waters 54, Gulf of Maine 7, western Nova Scotia 57, Browns Bank 253, northern



Track chart of October 1962 groundfish survey cruises by M/V Delaware, U. S. Bureau of Commercial Fisheries research vessel.

edge of Georges Bank 35, and a few stations in the Channel 14. Haddock and whiting were frequently caught on this trip, while many other species were caught more infrequently.

M/V "Delaware" Cruise 62-13 (October 25-November 4, 1962): The second part of the continuing study on distribution and abundance of young-of-the-year haddock and groundfish survey cruise was completed on November 4 when the Delaware returned to her base at Woods Hole, Mass.

During this phase of the study, the Delaware fished at selected stations off Cape Cod, on Georges Bank, and south to Block Canyon. Adverse weather conditions prevented completion of all the work planned for this phase of the study.

Biological information collected on the cruise included a series of haddock blood samples to aid in the identification of various haddock stocks. Also, special collections of sculpins, haddock, sea herring, and invertebrates were made for detailed study at the Bureau's Woods Hole Biological Laboratory. Hydrographic observations were made throughout the cruise to determine the relation of the distribution of groundfish species to the environment. Young haddock were found to be most abundant on Browns Bank, the northern

edge of Georges Bank, and on the western side of Nova Scotia.

Note: See Commercial Fisheries Review, November 1962 p. 32.

North Atlantic Fisheries Investigations

MAINE HERRING RESEARCH, AUGUST 1962:

During the first week of August 1962, 2,200 sardine herring were tagged at Moore Harbor, Isle au Haut, by biologists of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Maine. Eighty tags were recovered during August. A series of 400 sardines each tagged with green, scarlet, and yellow tags were released to compare the effect of color upon the recapture rate. During the month, fish tagged with 23 yellow, 14 green, and 1 scarlet tags were recaptured.

Eighteen sardine samples of 200 each were collected from the coastal fishery. The age of the sardines in 15 of the samples determined by the otolith technique demonstrated that the 1960 year-class dominated the August catches.

A 4-day cruise aboard the Bureau's research vessel Delaware was conducted in search of herring spawning areas along the northeast section of Georges Bank, and samples of herring were collected at 5 to 10 stations. Blood samples, lengths, weights, gonadal stages, fecundity, fin ray and gill raker counts, and occurrence of diseases were obtained and recorded for the herring collected.

North Pacific Exploratory Fishery Program

SURVEY OF DEEP-WATER MARINE FAUNA OFF COLUMBIA RIVER CONTINUED:

M/V "Commando" Cruise 5 (August 21-September 9, 1962): The chartered research vessel Commando returned to Seattle September 9, 1962, completing a 20-day cruise to survey the marine fauna southwest of the mouth of the Columbia River. This was the seventh survey cruise under the U. S. Bureau of Commercial Fisheries-Atomic Energy Commission cooperative program. Two cruises were made by the M/V John N. Cobb (cruises 50 and 53) and five by the Commando. (Several additional cruises were made by the John N. Cobb to survey the deep-water off the Columbia River as part of the Bureau's exploratory fishing program.) A standard 400-mesh eastern commercial otter trawl with a small mesh liner in the cod end was used to monitor stations at depths from 50 to 450 fathoms. A Gulf of Mexico shrimp trawl with extra weights on the doors was used to sample fauna at stations from 500 to 950 fathoms.

Species of fish encountered in greatest abundance were Dover sole (Microstomus pacificus), sablefish (Anaplopoma fimbria), ocean perch (Sebastodes alutus), and hake (Merluccius productus). Dover sole were found at stations from 50 to 450 fathoms, with the largest catch of 800 pounds per hour taken at 100 fathoms. Small sablefish were abundant at 50 fathoms (4,000 pounds per hour) and the catch of larger fish was greatest between 300 and 400 fathoms. Ocean perch were taken at depths between 100 and 225 fathoms. At the 150-fathom station 1,200 pounds per hour were recorded. The best catch of hake was made at 125 fathoms (4,000 pounds per hour). Other species of vertebrates were taken, but not in large numbers.

As in previous surveys, the tanner crab (Chionoecetes tanneri) was the only commercial invertebrate found in large numbers. The distribution pattern of the males and females of this species was similar to that found during the May-June 1962 survey, with the sexes almost completely segregated. The males were most abundant at 275 fathoms and the females at 350 fathoms. The centers of abundance of both sexes occurred 25 fathoms shallower than during the May-June survey of 1962 but at the same depths as during the June-July survey of 1961. The size of both adult male and female crabs decreased with depth.

The species and quantities of invertebrates taken during this survey were in agreement with previous surveys with the exception of the following: (1) Molpadid sea cucumbers were not found in large numbers, (2) increased numbers of a squid (Gonatus sp.) were taken in waters deeper than 175 fathoms, and (3) two species of deep-water shrimp were encountered which were new to the operations area.

A series of bottom grabs were successfully taken out to 75 fathoms using a Smith-McIntyre grab weighted with 100 pounds. Metering block failure prevented samples

from being taken at deeper stations, but indications are that the grab will be operational in deeper water. From the successful grabs, fauna were obtained of value to the program.

Samples of fish collected for the Atomic Energy Commission were delivered to the Laboratory of Radiation Biology, University of Washington.

Samples of bottom sediment were frozen for personnel at the Bureau's Biological Laboratory in Seattle.

The cooperative program with the Oregon Fish Commission to study the migrations of sablefish and Dover sole in the area of investigation was continued. Tagging was conducted at stations from 75 to 400 fathoms.

The study on heterotrophic marine bacteria by personnel from the College of Fisheries, University of Washington, was also continued during the cruise.

M/V "Commando" Cruise 6 (October 30-November 13, 1962): The eighth in a series of cruises designed to study deep-water marine animal life along a track line southwest of the Columbia River mouth was completed on November 13, 1962, by the U. S. Bureau of Commercial Fisheries chartered vessel Commando. The trip was part of a cooperative study with the Atomic Energy Commission. Two of the cruises in the series were made by the Bureau's exploratory fishing vessel John N. Cobb and six were made by the Commando.

Because of adverse weather conditions during the cruise, only the stations from 50 to 150 fathoms could be monitored. A standard 400-mesh eastern commercial otter trawl with a small-mesh liner in the cod end was used to sample the epifauna at each of the stations. A Smith-McIntyre bottom grab was used to sample the infauna.

Dover sole (Microstomus pacificus), rex sole (Glyptocephalus zachirus), hake (Merluccius productus), ocean perch (Sebastodes alutus), and dogfish (Squalus acanthias) were the species of vertebrates found in greatest abundance at the stations surveyed. The largest catch of Dover sole of 1,000 pounds per hour was at 75 fathoms. A similar catch per hour of rex sole was made at 50 fathoms. About 400 pounds of hake were caught at 50 fathoms in a one-hour tow. About 3,500 pounds of ocean perch were caught at the 150-fathom station during a one-hour tow. About 14,000 pounds of dogfish were caught at the 75-fathom station. It was the first time dogfish were caught in any large concentrations along the track.

Species of invertebrates caught with the trawl during the survey were in agreement with previous surveys at those depths. A total of 600 pounds of purple sea urchin (Allocentrotus sp.) were caught at 150 fathoms.

In addition to sampling the fauna at each station, bottom temperatures and salinity samples also were taken as part of the survey.

Samples of fish collected for the Atomic Energy Commission were delivered to the Laboratory of Radiation Biology, University of Washington. Samples of bottom sediment were frozen for personnel at the Bureau's Biological Laboratory in Seattle.

Sablefish and Dover sole were tagged by personnel from the Oregon Fish Commission who were aboard the vessel during the survey.

Also, the study on marine bacteria by personnel from the College of Fisheries, University of Washington, was continued.

Note: See Commercial Fisheries Review, August 1962 p. 34, July 1962 p. 34, June 1962 p. 31, April 1962 p. 20, February 1962 p. 32, November 1961 p. 26, September 1961 p. 35.

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SHRIMP DISTRIBUTION OFF VANCOUVER ISLAND STUDIED:

M/V "John N. Cobb" Cruise 56 (October 15-November 16, 1962): Shrimp explorations off the west coast of Vancouver Island from Barkley Sound to Cape Cook were completed on November 16 when the U.S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb returned to her base at Seattle after a 5-week cruise. A 42-foot Gulf of Mexico shrimp trawl was used.

A total of 60 exploratory drags of one-half hour each were made, primarily in the 60-95 fathom depth interval. Of the 60 drags, one yielded 150 pounds of pink shrimp (Pandalus jordani), 11 drags had between 25 and 50 pounds of pink shrimp, and 45 drags yielded less than 25 pounds of shrimp. Three drags out of the 60 were unsuccessful because of damage to the trawling gear. None yielded

shrimp in the quantity required for commercial fishing.

Exploratory operations on this trip were severely restricted during the last two and one-half weeks of the cruise because of bad weather.

The procedures used to survey the areas explored were:

1. Sounding transects were made with a high-resolution, low-frequency echo-sounder.

2. Shrimp trawl drags were made on those grounds indicated by the echo-sounder recording as being free of snags and having soft substrate. Initially, drags were made at 10-fathom intervals from 30-100 fathoms to find where the shrimp were most concentrated. Since no large concentrations were found, subsequent drags were made at random throughout the 60-105 fathom depth range in which some shrimp were caught.

3. Samples of shrimp were frozen and returned to the Bureau's Seattle Biological Laboratory for examination.

Note: See Commercial Fisheries Review, November 1962 p. 32.

Oceanography

FIRM RECEIVES CONTRACT TO DEVELOP ANTIFOULING DEVICE:

An oceanographic research and development firm of Houghton, Wash., has been awarded a contract by the U. S. Office of Naval Research to investigate the feasibility of a new principle for making salinity measurements in ocean waters, based on a device developed by this firm for another electrochemical measurement and which has been used successfully for over six months.

The contract calls for the firm to develop and test in their laboratories (located near Lake Washington and Puget Sound) several new models of an instrument which eliminates biological fouling by marine algae, bacteria, or other marine life through direct ultrasonic vibration of the measuring sensor or electrode.

The tests will determine the comparative rates of fouling with the new device and with conventionally used sensors for determining salinity.

Biological fouling has hampered research scientists in their efforts to take environmental measurements of salinity and other water properties. In a rather short period, conventional electrodes cease to function properly due to fouling on the electrode surface. The new development potentially ends the problem.

The original development by the Houghton firm was for laboratory oxidation-reduction potential measurements and its principle had not been tested for environmental salinity measurements, using conductivity cells and temperature sensors for the purpose of computing salinity.

* * * * *

INSTRUMENTATION SYSTEM BEING DEVELOPED FOR STUDY OF OCEAN BOTTOM CURRENTS AND SEDIMENT MOVEMENT:

A contract to develop and fabricate a complete instrumentation system for a study of bottom currents and sediment movement across the Continental Shelf that borders the Pacific Northwest was awarded to a Seattle, Wash., firm specializing in instrumentation for fisheries and oceanographic research.

The contract was let by the University of Washington which is conducting the study under an Atomic Energy Commission contract. The project will be conducted by the University's Oceanography Department. Focal point of the researvh will be at the mouth of the Columbia River.

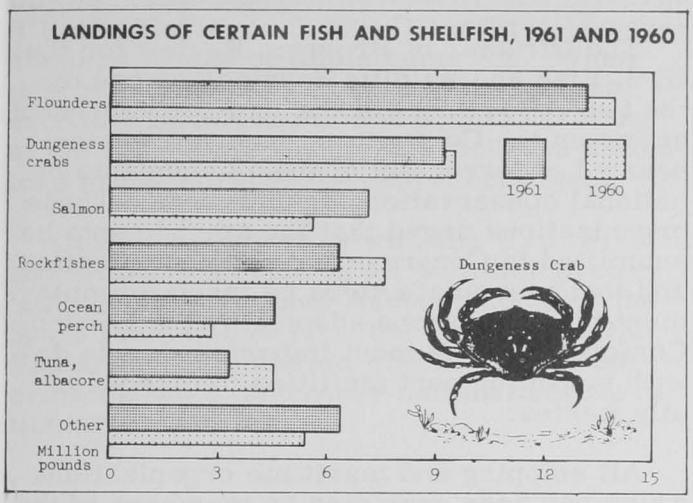
A spokesman for the Seattle firm said the instrument package will include an underwater platform, a shipboard power supply control, and the platform and shipboard control chassis.

Underwater television will be the key device in the four-year study which has as its objective the perfection of a method to measure in detail the bottom current profile over the Continental Shelf and the amounts and characteristics of the sediment moved by the current. Also, investigators seek to determine the relationships between the sediment movement and the bottom characteristics and water velocities as they exist near the sediment-water interface.

Oregon

FISHERY LANDINGS, 1961:

Fish and shellfish landings in Oregon during 1961 totaled 49.8 million pounds valued at $6.5 million ex-vessel. Compared with 1960, this was a gain of 632,000 pounds (1 percent) in quantity and $398,000 (7 percent) in value. Greater landings of ocean perch (up 1.8 million pounds) and salmon (up 1.5 million pounds) contributed largely to the 1961 increased catch.



Flounders led all species in quantity landed during 1961 with 13.2 million pounds. Dungeness crabs were next with 9.2 million pounds, and salmon third with 7.1 million pounds. Rockfish, ocean perch, and albacore tuna followed with 6.2, 4.6, and 3.2 million pounds, respectively. These 6 varieties of fish and shellfish comprised 87 percent of the 1961 total catch.

* * * * *

ESCAPEMENT OF SUMMER STEELHEAD TROUT ABOVE BONNEVILLE DAM NEAR RECORD IN 1962:

The second highest escapement of summer steelhead trout (Salmon gairderii) above the upper limit (Bonneville Dam) of the commercial fishery in nearly a quarter of a century was recorded on the Columbia River this year, the Oregon State Fisheries Director announced on October 2, 1962. The run into the river, based on the commercial catch below Bonneville Dam plus the Bonneville passage count, was about 245,000, the largest since 1955. The commercial catch took an estimated 34-35 percent of the run, a record low harvest of the summer run.

Summer steelhead enter the Columbia River April-October with the peak occurring June-August. During April 1-September 30, 1962, the count over Bonneville Dam was 162,000. A few thousand more may have moved over the Dam in October.

Commercial gill-netters and Indian dip-netters accounted for a substantial portion of the catch above the Dam until 1957 when commercial fishing above Bonneville was prohibited. The remaining very limited Indian fishery in that area accounts for no more than a few thousand steelhead in a year. Hence the Bonneville count for all practical purposes now represents the escapement above the commercial fishery. The record escapement was an estimated 203,000 steelheads in 1952. The average escapement during the past 10 years has been 140,000.

The State Fisheries Director pointed out that this does not mean that number reaches the spawning grounds. Many die from natural and environmental problems before spawning. In addition, the important and rapidly increasing sport fishery in the Columbia River and Snake River systems above Bonneville accounts for a significant percentage of those fish prior to spawning.

One of the primary reasons the commercial catch was a record low percentage of the run was that the summer commercial fishing season was shortened by two days this year to increase the escapement of summer steelhead. The desired effect was realized and near-record numbers passed the commercial fishery into the upper river areas. This occurred even though the run was well below the record of 423,000 fish in 1940.

There is much more to insuring good runs than merely putting substantial numbers of mature fish in the upper river. Disease and water temperature play vital roles in the success of spawning. Subsequently the rearing conditions for the young in the headwater streams may determine the success or failure of the fish of a given brood. But the first step is to get the spawners to the spawning grounds to lay eggs, and in the case of the 1962 summer steelhead run, this first important step has been accomplished.

Oysters

VIRGINIA PRODUCTION ADVERSELY AFFECTED BY MSX:

Nearly half of the rented oyster bed acreage in Virginia was not planted in 1962 because of the ravages made by the

oyster pest MSX (a protozoan parasite). Oyster production in Delaware Bay and Chesapeake Bay, in particular, has been seriously reduced because of MSX, according to the Virginia Institute of Marine Science. All of the areas affected are in high-salinity waters.

In 1961, oystermen in Delaware Bay, where the disease became serious about two years earlier than in Chesapeake Bay, planted rather large seed oysters in the spring and harvested them in the fall and winter without serious losses. Virginia oystermen are hopeful that MSX is now less active in Chesapeake waters.

The year 1962 brought signs of improvement in the afflicted areas but there was little reason for great optimism. In the afflicted areas, MSX appeared to be less abundant but oysters were very scarce. The scarcity of oysters in the infested areas is the chief reason for low optimism. An oyster pest cannot flourish in areas where there are no oysters. Therefore, what would happen if large quantities of oysters were planted in the infested areas is uncertain.

The evidence from trial plantings of oysters is not very encouraging. Each year a bed has been planted in Mobjack Bay, one of the centers of infestation. Those planted in August 1961 are about two-thirds dead now. A tray of James River seed placed in Mobjack Bay in March 1961 lost 60 percent of the oysters the first year, and about 55 percent of the survivors died from March through September 1962. Oysters transplanted from James River in March 1962 have begun already to die from MSX. Those losses occurred without the help of Dermocystidium, which is now scarce in Mobjack Bay. If those losses are typical of all infested areas, oyster culture is still not feasible.

The cycle of penetration of the James River seed area by MSX in summer, followed by its disappearance in early spring when salinities are low, was repeated in 1961/62. MSX did not reappear in the James River seed area during the summer of 1962, except on Brown Shoal. Its absence there could not be determined until later in 1962.

Dermocystidium marinium, the fungus which has long taken a toll of Virginia oysters, has about the same pattern of distribution as MSX. However, it seems to be more tenacious in holding its position on the fringes of its area of activity. After limited activity in the summer of 1961, Dermocystidium came back strongly in 1962 wherever a supply of oysters was available. Serious losses from the fungus have occurred in limited areas upstream of the range of activity of MSX, but still in relatively salty waters.

For the areas infested with MSX, cautious trial plantings have been suggested by the Institute. The distribution of MSX in Virginia waters has not changed appreciably in the past year. It is possible that as the epidemic from MSX wanes, there will be areas where oysters can be held one or more years without serious losses. The best advice offered is to be sure that disease-free seed is planted, and to avoid crowding of oysters and planted beds. As much isolation from other oysters as possible should be observed for each planting. Like most diseases, MSX probably responds to crowded conditions. No oyster seed of known resistance to MSX is available, although scientists all along the mid-Atlantic coast are working on the problem.

Planting of oysters in MSX-infested areas still appears to be hazardous. The epidemic has subsided considerably which may permit holding oysters for longer periods with fewer losses than in recent years. The Institute states that all plantings should be regarded as trials, and watched very carefully for protection of investments. Advice on time for planting, and time for sampling beds, to obtain the best results is available from the Institute at Gloucester Point, Va.

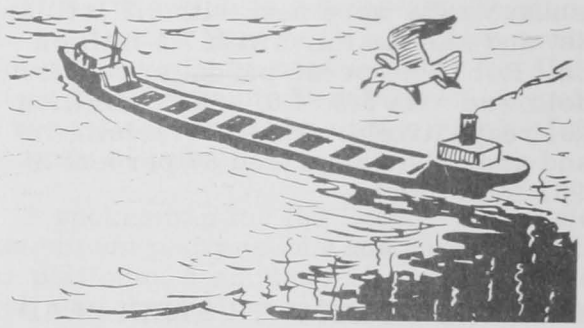
Pollution

MEETING HELD ON POLUTION OF THE SEAS BY OIL WASTES:

A meeting was held on October 26, 1962, by the National Committee for Prevention of Pollution of the Sea by Oil. Purpose of the meeting was to report to the Committee regarding the views of non-government organizations concerning amendments to the 1954 Convention that were developed at the International Conference in London in March and April 1962.

The Director of Program Review for the U. S. Fish and Wildlife Service and one of the two Department of the Interior representatives on the Committee, reported wholehearted endorsement of the amendments by national conservation organizations. These organizations urged that the amendments be submitted to Congress for early ratification and that immediate steps be taken to implement the resolutions adopted by the London Conference. The most important has to do with providing port facilities to dispose of oily wastes.

All shipping and maritime organizations which had been contacted by members of the Committee also support the measures.



The National Committee will report to the Secretary of State on these attitudes and make recommendations to submit the 1962 amendments for ratification. The report will cover the reservations relating to the 1954 Convention and the four recommendations of the Senate Foreign Relations Committee in their report to the State recommending ratification of the 1954 Convention.

At the urging of the Department of Interior representative, a strong United States position was adopted by the Shipping Coordinating Committee in their recommendations to the Secretary of State for the Intergovernmental Maritime Consultative Organization

Council (IMCO) meeting, October 17, 1962. This recommendation covered an agenda item urging that IMCO establish machinery allowing it to act as a clearing house for research, statistics, technical information, and reports on the status of pollution of the seas by oil, in order to foster international cooperation.

The Commandant, U. S. Coast Guard and Chairman of the National Committee, reported that the IMCO Council received the United States position favorably and referred it to the Maritime Safety Committee to recommend means of implementation. When this is done there will be an international exchange of information which was lacking at the 1962 conference and which was a handicap to the work of the representatives.

Closely cooperating with the U. S. Fish and Wildlife Service in oil pollution problems are the National Audubon Society, the Sport Fishing Institute, the Pacific Marine Fisheries Commission, the National Fisheries Institute, and other national conservation organizations.

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TOXICITY OF CERTAIN CHEMICALS TO FISH STUDIED:

Experiments to determine the toxicity to four species of juvenile estuarine fishes of certain chemicals have been conducted by the Sandy Hook (New Jersey) Laboratory of the U. S. Bureau of Sport Fisheries and Wildlife. The chemicals tested were an organophosphorous insecticide (parathion), a chlorinated insecticide (p, p^8 DDT), a synthetic detergent, and a soap (Lux). Preliminary screening experiments indicate that eels (Anguilla rostrata), winter flounders (Pseudopleuronectes americanus), Atlantic silversides (Menidia menidia), and mummichogs (Fundulus heteroclitus) were not affected by 650 parts per million (p.p.m.) of the soap. But the median tolerance levels (Tlm)--the levels at which half the fish are killed--for the detergent range from 10 to 23 p.p.m.; for DDT, 0.001 to 0.008 p.p.m.; and for parathion, 3.6 to 5.3 p.p.m. The reaction of eels to parathion suggests that the insecticide is more toxic at relatively low salinities (Tlm at 5 o/oo is 0.03 p.p.m.; Tlm at 20 o/oo is 5.3 p.p.m.)

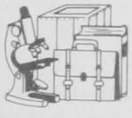
The experimental fish were feeding actively in the laboratory two weeks before the test. No food was offered the fish during exposure to various concentrations of the chemicals in 20-liter glass jars. The jars were filled with 19 liters of water at 20 o/oo salinity, 20° C. (68° F.), and pH 7.4. The jars were glass covered and aerated.

* * * * *

NEW LABORATORY TO STUDY WATER POLLUTION BY PESTICIDES:

A new $65,000 Public Health Service laboratory to study the presence of pesticides in soil and water has been opened in Atlanta, Ga., the U. S. Department of Health, Education, and Welfare announced November 26, 1962. The new laboratory is part of a full-scale investigation of water pollution by pesticides which was begun in 1959 in the southeastern States. The amounts of insecticides now reaching waterways are being measured and possible damage to stream and other life is being studied, particularly in cases where the insecticides are presently at low levels. "A start has been made toward evaluation of pesticides and their use in relation to water pollution," the Director of the Atlanta laboratory said, "but much remains to be done. It is evident that pesticide pollution can and does occur and, in quantities below the level acutely toxic to aquatic life, it may be rather common in areas of routine pesticide usage."

Established and operated by the Public Health Service's Division of Water Supply and Pollution Control, the new laboratory will provide analytical facilities to supplement national field studies of pesticides, insecticides, and herbicides in streams, lakes, and ground water. It will extend Public Health Service research in the field of insecticides, which already involves some $3 million annually of Public Health Service funds. The research covers many fields of medicine and science, including toxicology, entymology, vector control, and environmental health.



Preservation

QUALITY OF OCEAN PERCH HELD IN REFRIGERATED SEA WATER GOOD:

The first landings of ocean perch held in an experimental refrigerated sea water tank aboard a Gloucester, Mass, commercial fishing vessel (Judith Lee Rome) proved very suc-

cessful. The quality of the fish held 11 days in refrigerated sea water storage aboard the vessel was very good. The foreman of the plant where the fish were processed remarked: "best quality 11-day fish I've ever seen." The experiments aboard the commercial fishing vessel are being conducted by technologists from the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass.

Puerto Rico

FISH AND SHELLFISH LANDINGS, 1961:

Puerto Rico's total fish and shellfish landings in 1961 amounted to 7,250,000 pounds valued at $1,666,000. Landings for that year were up 6.2 percent and the value increased 18.8 percent from the 1960 landings. The increase was mostly in marine finfish and crustaceans (spiny lobster and crab), but landings were somewhat lower for other groups as compared with 1960.

The 1961 salt-water fish and shellfish landings consisted of: finfish 6 million pounds, crustaceans 670,000 pounds, mollusks 60,000 pounds and sea turtles 120,000 pounds. Fresh-water fish landings for the year totaled 400,000 pounds.

Editor's Note: Data evidently do not include tuna landed at Puerto Rico by fishing vessels for use of tuna canneries.

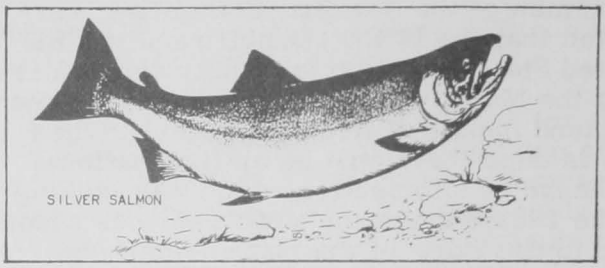
Salmon

FALL 1962 RUN OF ADULT SILVER SALMON TO NORTHWEST PACIFIC HATCHERIES GOOD:

A good run of silver salmon returned to Pacific Northwest fish hatcheries in the fall of 1962, according to the Seattle Regional office of the U. S. Bureau of Commercial Fisheries. Early November 1962 from state and national hatcheries in Washington and Oregon indicated the best run of this species in many years.

Although the run was not complete as of November 9, 1962, it appeared that the number of returning silver salmon, which return to their place of birth after two years in the Pacific Ocean, more than doubled in the past six years.

The report stated that about 15,000 silver salmon had passed through the fish-counting device at Bonneville Dam on the Columbia River since mid-September 1962, the highest return of that species in 22 years at that location. It was emphasized that this figure was only part of the total number returning, since most of the spawning of silver salmon is downstream from Bonneville Dam. At Eagle Creek National Fish Hatchery located



on a tributary of the Clackamas River in Oregon, more than 6,000 silver salmon had passed over the Eagle Creek falls ladder since the run started. Winthrop National Fish Hatchery on the Methow River in north-central Washington had taken more than 150,000 silver salmon eggs from returning fish by early November 1962. The announcement stated that this is encouraging evidence that the Bureau had been successful in its attempt to re-establish a silver salmon run in an upriver portion of the Methow River which had been extinct for a long time. In 1960, Bureau biologists had moved 250,000 silver salmon eggs from the Eagle Creek hatchery to the Winthrop hatchery, where the eggs were hatched and later the young silver salmon were released to go to sea, some of which returned as adults this past fall.

* * * * *

ANTIOXIDANT TESTED TO PREVENT RANCIDITY IN FROZEN SALMON:

In the course of studies on methods of measuring oxidation in fishery products the U. S. Bureau of Commercial Fisheries Technological Laboratory at Seattle, Wash., evaluated EMQ (6-ethoxy-2,2,4,-trimethyl-1,2-dihidrequinoline) as an antioxidant for frozen salmon. The research showed that the antioxidant EMQ has very definite effects in retarding oxidation. Salmon steaks and minced fresh samples held at +20° F. showed no evidence of rancidity after five weeks of storage while control (untreated) samples were unacceptable due to rancidity. In addition, the color of the EMQ-treated samples were nearly unchanged while the control samples had faded appreciably.

However, practice application of this research is not feasible at present. Application of EMQ is difficult because it is insoluble in water. All test samples show that a bitter off-flavor (medicinal) was imparted either by the EMQ or the emulsifying agent. In addition, this antioxidant does not have the approval of the U. S. Food and Drug Administration for use as an additive in foods for human consumption.

* * * * *

COMPARISON OF HATCHERY METHODS FOR REARING SALMON:

Fall chinook salmon fingerlings reared in rectangular recirculating ponds showed significantly better performance in preliminary stamina tests than those reared in raceways. The tests were carried out at the U. S. Fish and Wildlife Service Salmon Cultural Laboratory, Longview, Wash., which designed the ponds. Survival to adults in the ocean as measured by recapture of marked salmon from each group will be the final test of the two rearing methods. A total of 215,000 fall chinook salmon fingerlings are included in each group. Salmon from the two groups will be distinguished by different methods of fin-clip marking.

Shrimp

PINKS REARED FROM EGGS TO JUVENILE STAGES:

Pink shrimp (Penaeus duorarum) have recently been reared from eggs to juvenile stages at the Institute of Marine Science, University of Miami. The shrimp on November 26, 1962, were approximately one inch in total length

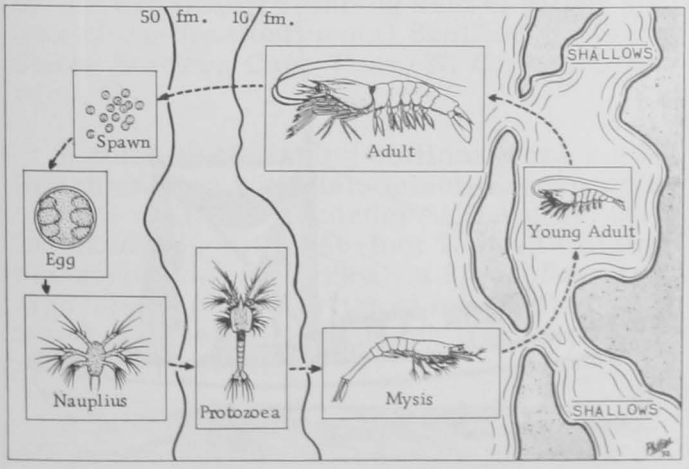


Fig. 1 - Diagram of the life cycle of the white shrimp (Penaeus setiferus).

Fig. 2 - Photomicrograph of pink shrimp eggs in several stages of development.

and it is expected that they will be reared to adult size before the experiment is ended. The work was done under a contract with the U. S. Bureau of Commercial Fisheries to study the early life history of pink shrimp.

On two occasions in August 1962, ripe female shrimp spawned in the laboratory and the resulting larvae were reared successfully. The shrimp, collected from the Tortugas shrimp grounds of southern Florida, spawned within 24 hours after being placed in aquaria. Special rearing techniques were used to overcome some of the problems encountered by previous workers. Daily supplies of food and water, as well as individual care of the larvae, increased survival. A mixture of unicellular algae, diatoms, dinoflagellates, and marine yeasts was used as food.

The results of the work have important applications both to the study of the biology of shrimp and the development of aquiculture techniques for shrimp. Growth stages obtained from rearing are useful in identifying specimens collected in plankton tows. The stages obtained from this work verified earlier conclusions regarding the larval development of pink shrimp which resulted from a previous study at the Institute of Marine Science (Dobkin, S. 1961. "Early Developmental Stages of Pink Shrimp (Penaeus duorarum), from Florida Waters." U. S. Fish and Wildlife Service Fishery Bulletin 190, vol. 61, pp. 321-349). Perfection of techniques to enable mass rearing of shrimp will facilitate further studies on food preference, effects of temperature and light, and various aspects of behavior. These in turn may shed light on the dynamics of natural populations.

Fig. 3 - Photomicrograph of fifth nauplius of pink shrimp.

The ability to rear shrimp from the egg opens the door to the possible artificial culture of shrimp. Johnson and Fielding (1956: Tulane Studies in Zoology, vol. 4, no. 6, pp. 173-190) used pond culture techniques in rearing larvae of the white shrimp (Penaeus setiferus). However, there has been no reported success of laboratory rearing of any Atlantic commercial shrimp species through postlarval stages. A Japanese scientist, Dr. Motosaku Hudinaga, has successfully reared penaeid shrimp, first in the laboratory, and then on a larger scale. At the present time his shrimp farm outside Tokyo supplies restaurants with shrimp on a subcommercial basis. It is expected that shrimp farms in central Japan will eventually produce 2,000 tons of shrimp per year (U. S. Bureau of Commercial Fisheries, New Orleans Market News Service, Fishery Products Report 0-234, December 5, 1961).

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UNITED STATES SUPPLY INDICATORS, NOVEMBER 1962:

Item and Period	1962	1961	1960	1959	1958
	..... (1,000 Lbs., Heads-Off).				
Total landings, So. Atl. and Gulf States:					
December	-	6,538	7,097	8,716	8,099
November	11,800	9,996	14,454	12,412	12,416
January-October .	84,246	74,862	119,484	109,531	96,037
January-December	-	91,396	141,035	130,659	116,552
Quantity canned, Gulf States 1/:					
December	-	889	977	1,278	1,943
November	2,500	2,369	1,614	2,312	3,424
January-October .	19,500	12,535	26,003	21,089	21,037
January-December	-	15,793	28,594	24,679	26,404
Frozen inventories (as of end of each mo.) 2/:					
December 31	-	19,755	40,913	37,866	32,844
November 30	4/	20,668	37,264	37,334	30,211
October 31	21,815	17,811	31,209	33,057	24,620
September 30....	12,843	13,361	24,492	26,119	18,079
August 31	12,754	12,728	20,171	23,780	15,274
March 31	16,607	31,345	23,232	24,893	14,501
Imports 3/:					
December	-	15,442	12,411	10,611	10,448
November	4/	14,852	13,516	10,269	10,617
October	18,279	16,813	14,211	15,340	11,463
January-September	89,343	79,175	73,280	70,335	52,866
January-December	-	126,268	113,418	106,555	85,394
	... (¢/lb., 26-30 Count, Heads-Off) ...				
Ex-vessel price, all species, So. Atl. and Gulf Ports:					
December	-	75.2	54.2	48.4	70.8
November	5/ 93-96	73.5	54.0	46.2	69.0
October	5/ 93-100	68.7	53.0	44.4	66.4
July, Aug. & Sept. .	5/ 85-100	65.5	52.6	47.0	68.4
Apr., May & June .	83.5	54.0	62.4	62.6	74.5
Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:					
December	-	91-92	68-70	64-66	87-89
November	105-110	89-92	69-73	60-65	83-87
October	108-120	83-90	69-73	59-62	80-84
July, Aug. & Sept. .	105-118	70-90	64-77	62-74	78-93
Apr., May & June . .	94-104	67-72	74-77	70-82	84-98

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 33.
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
4/Not available.
5/Range.
Note: Data for 1962 and 1961 are preliminary. November 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

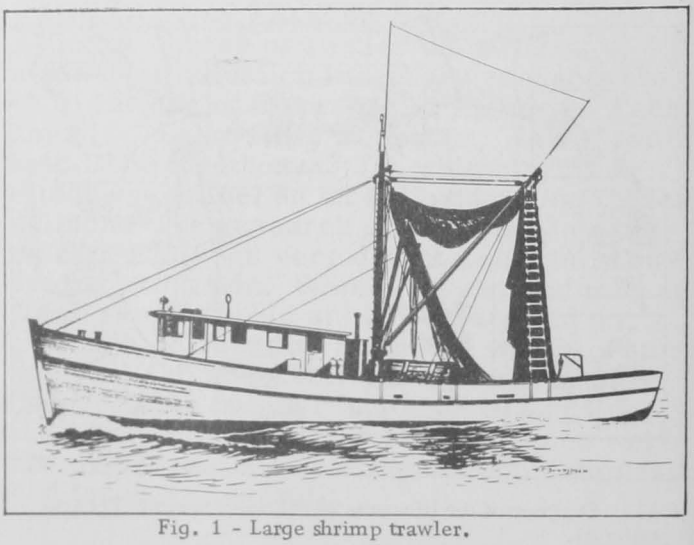

Fig. 1 - Large shrimp trawler.

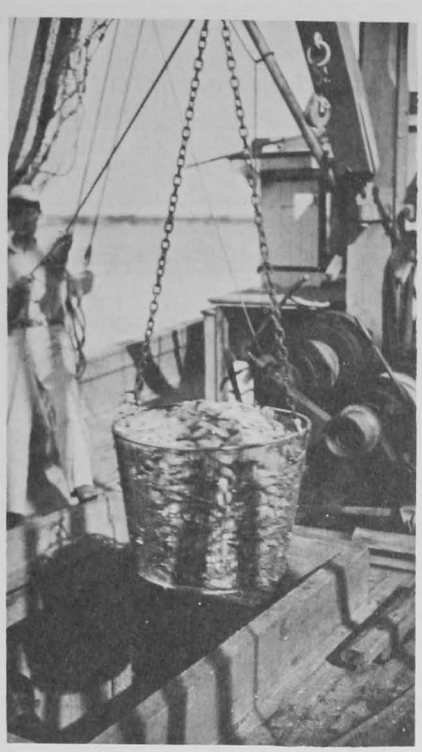

Fig. 2 - Unloading fresh shrimp at Morgan City, La.

South Atlantic

Exploratory Fishery Program

FISHING GEAR FOR CATCHING HERRING-LIKE FISH TESTED:

M/V "Silver Bay" Cruise 43 (October 29-November 16, 1962): Gear trials with midwater and off-the-bottom trawls, and fish traps were made on this cruise to test the effectiveness of the gear for catching herring-like fish in the area explored. The area of operations during this 18-day cruise by the exploratory fishing vessel Silver Bay was along the Continental Shelf of the United States between Cape Fear, N. C., and Brunswick, Ga.

A total of 48 fishing stations were made in conjunction with fish detection transects using a whiteline recorder. The gear used included a modified 40-foot British Columbia-style midwater trawl, a 25-foot square high-speed midwater trawl, an 80-foot wing trawl, and baited wire-mesh fish traps suspended off bottom.

A lack of midwater fish tracings and rough weather precluded work in depths deeper than 50 fathoms. Most fish concentrations were located within the 10-fathom curve.

Fishing results during the trip were generally poor, but a few good catches were made. Northeast of Myrtle Beach, S. C. (33°47'5"N.,

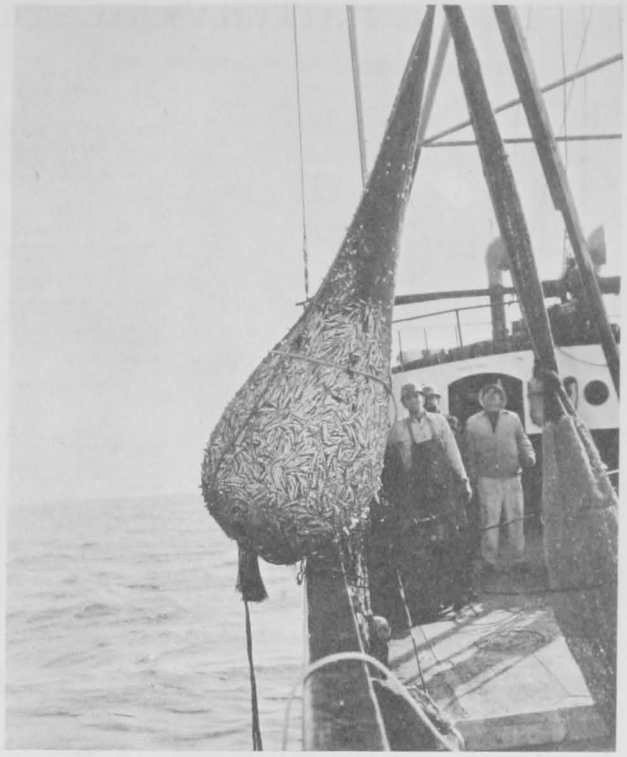

Fig. 1 - 2,500-pound catch of round herring from midwater trawling during cruise.

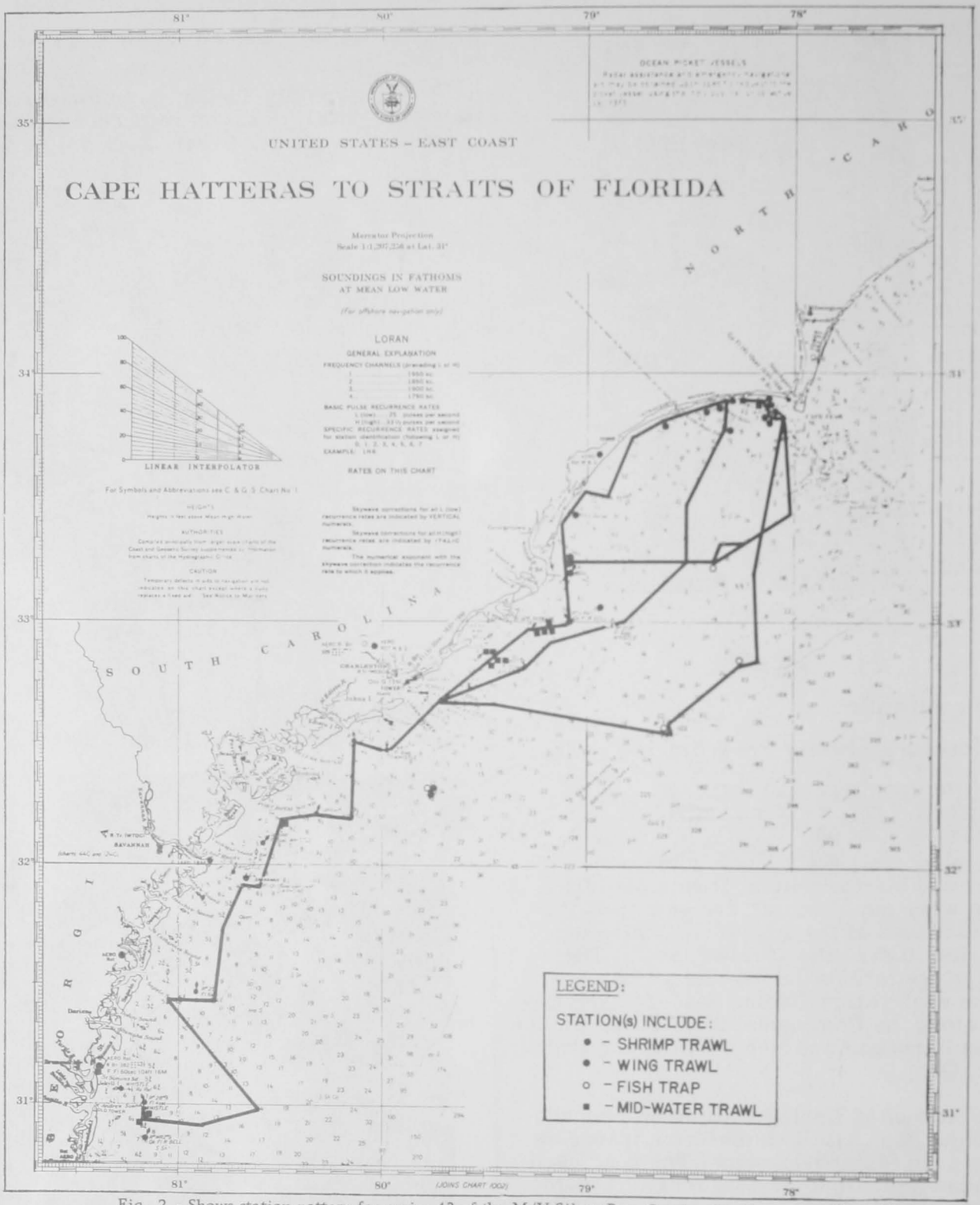

Fig. 2 - Shows station pattern for cruise 43 of the M/V Silver Bay, October 29-November 16, 1962.

78°38'5" W.), 3,500 pounds of anchovies (Anchoa sp.) counting 37 to 88 per pound were caught in a $1\frac{3}{4}$-hour tow with the wing trawl rigged on 8-foot bracket doors and fishing approximately 14 inches above the bottom. East of Cape Romain, S. C. (32°52'5" N., 79°28'5" W.), 2,500 pounds of round herring (Etrumeus sp.) were caught in a $1\frac{1}{2}$-hour tow with the British Columbia trawl rigged with 6-foot aluminum hydrofoil doors. Both trawls were equipped with an extension piece and cod end of $\frac{3}{4}$-inch stretched mesh webbing, 30-fathom legs and standard V/D rig.

Experimental midwater sampling with 5-foot long single funnel 28-inch diameter baited fish traps constructed of 1½-inch galvanized wire mesh failed to catch any fish.

Note: See Commercial Fisheries Review, August 1962 p. 38.

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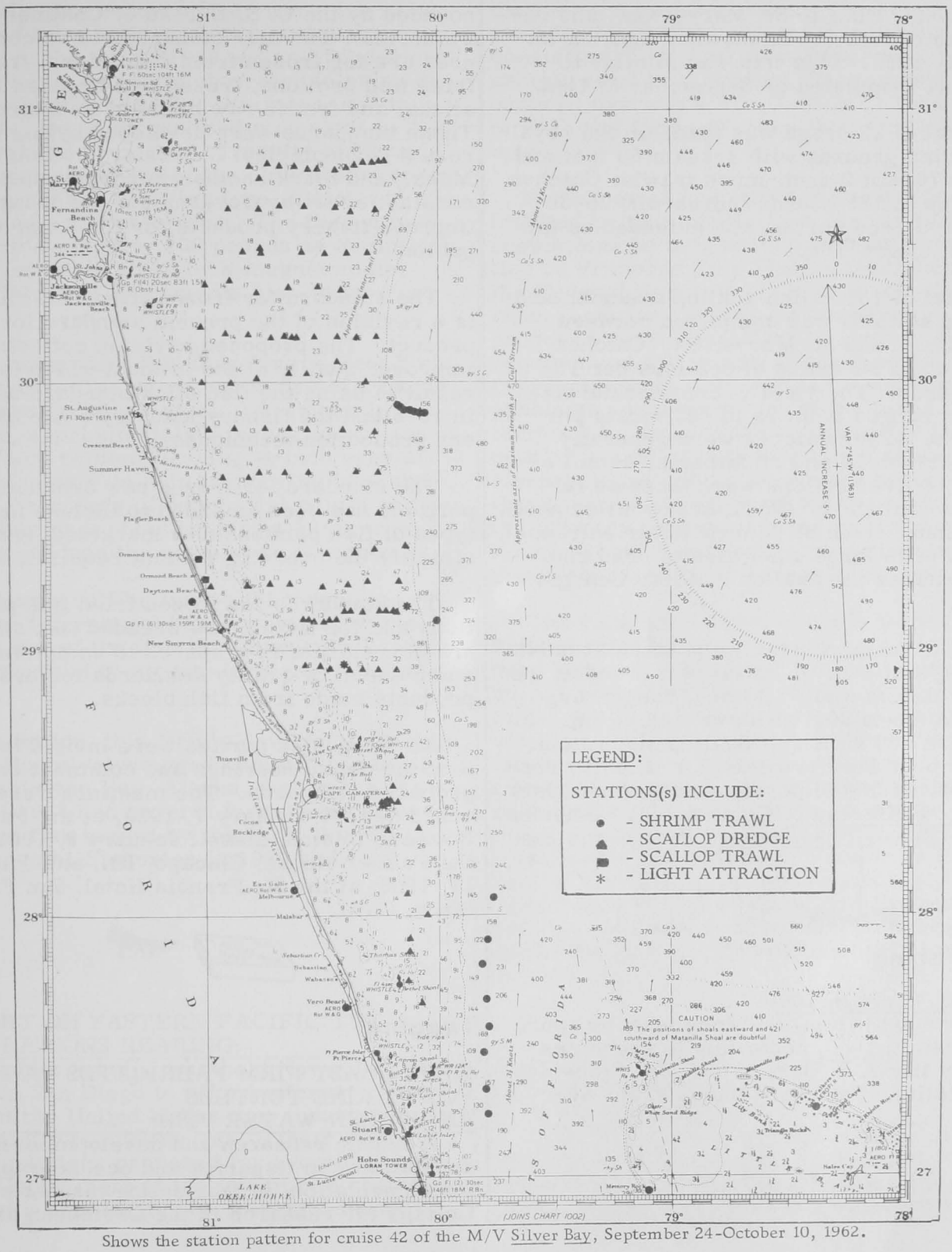
ROYAL-RED SHRIMP AND CALICO SCALLOP EXPLORATIONS CONTINUED:

M/V "Silver Bay" Cruise 42 (September 24-October 10, 1962): To obtain additional seasonal and geographical data on royal-red shrimp (Hymenopenaeus robustus) and calico



Shows the station pattern for cruise 42 of the M/V Silver Bay, September 24-October 10, 1962.

scallops (Pecten gibbus), and to provide assistance to the fishing industry, were the objectives of this cruise by the exploratory vessel Silver Bay of the U. S. Bureau of Commercial Fisheries. During the 17-day cruise, the vessel operated on the Continental Shelf along the southeast coast of the United States from Stuart, Fla., to St. Marys, Ga., and returned to its base at Brunswick, Ga., on October 10, 1962. This trip was similar to Cruise 41 completed on September 8, 1962.

A total of 23 drags was made on the royal-red shrimp grounds with 2-seam 60 foot and 4-seam 70 foot 2-inch-mesh trawls. Catches ranged up to 125 pounds (heads-off) 26-30 count royal-red shrimp and extended as far south as Stuart, Fla.

A total of 131 calico scallop dredging and trawling stations was completed between Bethel Shoal and St. Marys, Ga. Catches ranged up to 9 bushels of scallops per 15-minute drag. The yield of commercial size scallops ranged from 75 to 130 meats per pint. The larger catches were generally made between 14 and 20 fathoms. Small amounts of live scallops were taken as far north as latitude 30°47' N. (a few miles north and offshore from St. Marys River entrance), together with large quantities of dead shell which extends the scallop bed into Georgia waters.

Bottom temperatures were taken at most dredging stations. A larval net, towed at the surface during many stations, caught large numbers (up to 200) of larval and young swordfish and sailfish. Scallop shell stock and samples were provided for industry representatives and biologists and technologists of the U. S. Bureau of Commercial Fisheries.

Note: See Commercial Fisheries Review, November 1962 p. 43.

Sport Fishing

ANNUAL CATCH, 1960:

Over 600 million fish were taken by sport fishermen in 1960, according to estimates made by the U. S. Bureau of Sport Fisheries and Wildlife. The catch included 250 species of fish.

Standards

PUBLIC MEETINGS ON NEW GRADE STANDARDS FOR CERTAIN FISHERY PRODUCTS:

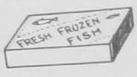
Public meetings to discuss four grade standards for certain fishery products were announced by the U. S. Bureau of Commercial Fisheries. The four standards to be considered are for frozen fried fish sticks, frozen fried fish protions, frozen raw breaded fish sticks, and frozen raw breaded fish portions. Those standards were developed by the Bureau's Technological Laboratory in Gloucester, Mass., and mark another important step in a constant effort by Government and industry to improve fishery products for the American public.

The standard for frozen fried fish sticks is a revision of the present standard for that product. The proposed revision reflects the improved quality of the product which is the result of using the fish stick standard adopted in 1956 and the fishery industry's use of modern production techniques.

The standard for frozen raw breaded fish portions has been amended to include new types of fish portions now marketed, and to simplify the breading content requirements.

The standards for frozen fried fish portions and for frozen raw breaded fish sticks are new standards prepared to complete the complement of quality standards for breaded products made from fish blocks.

All interested parties were invited to attend the public hearings and comment on the proposed standards. The meetings were scheduled for January 7, 1963, at the Parker House in Boston, Mass.; January 9, 1963, at the Palmer House, Chicago, Ill., and January 11, 1963, at the St. Francis Hotel, San Francisco, Calif.



Tagging

WEST COAST FIRM FABRICATES TAGS FOR MARINE TURTLES AND FRESH-WATER FISH:

A Seattle research and development firm, specializing in fisheries and oceanographic instrumentation, is fabricating magnetic turtle tags for research in the Caribbean and

wire-dart fish tags for studies in New York State.

The turtle tags were made for the Caribbean Conservation Corporation and will be gold-plated cobalt-vanadium alloy two-hundredths of an inch by one-quarter inch, permanently magnetized. They were due to be inserted into the legs of silver-dollar-size turtles in the fall of 1962 with a hypodermic needle and a magnetic obturator (closing device). Once the needle, obturator, and tag are inserted, a magnetized ring worn by the researchers from the University of Florida touches the free end of the obturator, repelling the tag and allowing free withdrawal of both needle and obturator. The tagged turtles, often weighing 300 pounds as adults, will later be detected by a magnetometer which Oceanic Instruments also is fabricating.

The wire-dart fish tags for the New York State sports fishing research are of a hard-tempered stainless steel, 0.012-inch in diameter, approximately 2 inches long, bent in half and twisted, leaving $\frac{3}{16}$-inch eyes at one of the ends to hold identifying tabs and, at the other ends, $\frac{3}{64}$-inch dart points and $\frac{5}{32}$-inch blunt ends, bent back at a 40-degree angle to reduce the possibility of workouts.

The tags will be inserted between the vertical interneural bones (just below the dorsal fin) of the fish in a manner which will allow the tabs to stream in-plane with their backs.

In addition, this firm's device for detecting radioactively-tagged herring was used in Washington Bay, Alaska, during the summer of 1962 and several tags were recovered from fish tagged by the U. S. Bureau of Commercial Fisheries in 1960 and 1961.

Tuna

REPORT ON EASTERN PACIFIC TUNA REGULATIONS HEARING:

A public hearing was held November 19, 1962, in San Diego to afford interested members of the United States tuna industry an opportunity to present orally their views on the regulations proposed for adoption by the U. S. Department of the Interior to control yellowfin tuna fishing by domestic tuna fishermen in the Eastern Pacific and to restrict imports of tuna from countries which may fail to cooperate in carrying out the conservation recommendations of the Inter-American Tropical Tuna Commission. That Commission has recommended a conservation program for the yellowfin tuna resources of the Eastern Pacific Ocean. The hearing was attended by approximately 45 individuals, consisting of several tuna fishermen, representatives of boat owners, fishermen's unions, cannery operators, the California Department of Fish and Game, and the Interior Department.

A number of industry representatives contributed helpful suggestions for revising the regulations as originally proposed in the Notice of Proposed Rule Making published in the Federal Register of October 18. Industry representatives expressed concern over the proposed vessel registration system and the requirement for weekly radio reports. Those representatives also outlined a number of problems which might be encountered in attempting to observe the limitation of 15 percent by weight of yellowfin taken as an incidental catch during the closed season on that species. Aside from those points, which the industry representatives urged be given further study, the regulatory system proposed appeared to be generally acceptable.

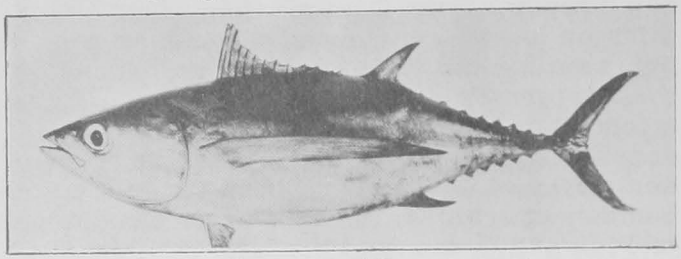
The industry representatives were informed that the record would be kept open until December 19, 1962, for the receipt of any additional written material which they might desire to submit for consideration. It will be recalled that the Department's regulations cannot be placed in effect until all countries which engage in fishing in the area on a meaningful scale agree upon a date for the simultaneous application of conservation measures which will be applicable to the vessels of the several countries involved. Developments to date indicate that the recommended yellowfin tuna conservation regime cannot be implemented before early summer of 1963.

* * * * *

ALBACORE MIGRATION PATTERN SHIFTS IN EASTERN PACIFIC DUE TO WARMER WATER:

U. S. Navy picket vessels, cooperating with the U. S. Bureau of Commercial Fisheries Biological Laboratory at San Diego, Calif., caught more than 675 albacore in

1962; and 8 of those fish were taken at 50° N. latitude. This is the farthest north albacore have been taken in quantity by picket vessels since the program started three years ago.



Pacific albacore tuna (Thunnus germo).

Catches that far north are believed to be the result of the shift of the migratory route of incoming albacore schools to the north because of the warmer water covering much of the central North Pacific in 1962.

U.S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, OCTOBER 1962:

During October 1962, a total of 25 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 28 in October 1961. There were 30 documents cancelled for fishing vessels in October 1962 as compared with 26 in October 1961.

Table 1-U.S. Fishing Vessels 1/-- Documentations Issued and Cancelled, by Areas, October 1962 with Comparisons

Area (Home Port)	October 1962	October 1961	Jan.-Oct. 1962	Jan.-Oct. 1961	Total 1961
	(Number)				
Issued first documents 2/					
New England	1	1	25	28	33
Middle Atlantic	-	-	2	11	12
Chesapeake	6	14	35	62	75
South Atlantic	3	2	40	42	47
Gulf	7	4	94	91	100
Pacific	7	6	122	147	149
Great Lakes	1	1	4	12	12
Puerto Rico	-	-	-	2	2
Total	25	28	322	395	430
Removed from documentation 3/ :					
New England	-	1	19	16	20
Middle Atlantic	2	1	33	24	34
Chesapeake	3	-	22	27	28
South Atlantic	6	4	35	25	30
Gulf	9	7	95	84	103
Pacific	10	15	92	86	112
Great Lakes	-	-	18	13	14
Hawaii	-	-	3	-	-
Puerto Rico	-	-	1	-	-
Total	30	28	318	275	341

1/For explanation of footnotes, see table 2.

The skeleton of a new shrimp trawler. Like most shrimp trawlers in the fleet, this has a wooden hull.

Table 2-U.S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, October 1962

Gross Tonnage	Issued 2/	Cancelled 3/
	(Number)	
5-9	5	9
10-19	13	13
20-29	-	2
30-39	4	2
40-49	-	2
50-59	-	1
70-79	1	-
80-89	1	-
110-119	-	1
540-549	1	-
Total	25	30

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 16 in 1962; 1 in 1961; 1 in 1955; and 7 prior to 1951. Assigned to areas on the basis of their home ports.
3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

* * * * *

NEW FISHERY RESEARCH VESSEL FOR BUREAU OF COMMERCIAL FISHERIES:

Albatross IV, the new fishery-oceanographic research vessel of the Bureau of Commercial Fisheries was scheduled for commissioning the latter part of December

The new fishery-oceanographic research vessel of the U. S. Bureau of Commercial Fisheries--the Albatross IV.

1962 at the Bureau's new dock facilities at Woods Hole, Mass. Her first assignment will be along the George's Bank fishing grounds in the North Atlantic Ocean.

The modern ocean-going research vessel has scientific facilities rivaling those of many shore laboratories and represents a new step forward in United States oceanographic studies. In commenting on the vessel, Secretary of the Interior Stewart L. Udall said, "We have lagged behind other nations that have provided their fishing industry with the latest in equipment and scientific knowledge. We are determined to overcome that lead."

The Albatross IV is a 187-foot single-screw stern trawler, the first of its kind ever built in the United States. It will allow scientists to (1) chart the distribution and abundance of groundfish and scallops, (2) study seasonal changes in fish stocks, (3) locate bottom fish which serve as food for groundfish, and (4) uncover plankton population centers.

Note: See Commercial Fisheries Review, July 1962 p. 42.

U. S. Foreign Trade

IMPORTS OF FRESH OR FROZEN TUNA THROUGH THE U. S. CUSTOMS DISTRICT OF PUERTO RICO, JANUARY-JUNE 1962:

During January-June 1962, 23.9 percent of the total U. S. imports of fresh or frozen tuna entered through the U. S. Customs District of Puerto Rico.

Imports of Fresh or Frozen Tuna Through the U. S. Customs District of Puerto Rico by Country of Origin, January-June 1962

Country of Origin	Quantity
	Pounds
British West Africa and Sierra Leone	12,782,189
Japan	9,042,933
Peru	6,301,004
Western Africa 1/	3,167,465
Ecuador	2,471,840
Australia	1,106,639
Other countries	550,947
Total	35,423,017

1/ Includes Togo, Guinea, Mali, Senegal, Ivory Coast, Dahomey, Upper Volta, Mauritania, and Niger.

Note: Imports into Puerto Rico from foreign countries are reported as United States imports by the U. S. Bureau of the Census. But shipments between Puerto Rico and the United States or between Puerto Rico and the territories and possessions of the United States are not reported as United States imports by the Bureau of the Census.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 3, 1962, amounted to 47,404,873 pounds (about 2,257,375 std. cases), according to data compiled by the Bureau of Customs. This was 3.6 percent more than the 45,545,956 pounds (about 2,168,855 std. cases) imported during January 1-October 28, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty is limited to 59,059,014 pounds

(about 2,812,000 std. cases of 48 8-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

EDIBLE FISHERY PRODUCTS, OCTOBER 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in October 1962 were down 10.1 percent in quantity but up 4.9 percent in value from those of the previous month. The drop in quantity was mainly due to a large decline in imports of frozen tuna (decline mostly from Japan, Peru, British West Pacific Islands, and Ecuador). The decline was partly offset by a large increase in imports of frozen shrimp (increase mostly from Mexico). There was also some increase in imports of other higher-priced products such as swordfish fillets, canned sardines not in oil, canned oysters, frozen spiny lobsters, frozen sea scallops, frozen frog legs, and frozen ocean perch fillets.

U. S. Imports and Exports of Edible Fishery Products, October 1962 with Comparisons

Item	Quantity				Value			
	Oct.		Jan-Oct.		Oct.		Jan.-Oct.	
	1962	1961	1962	1961	1962	1961	1962	1961
	. (Millions of Lbs.).				. (Millions of $) .			
Imports:								
Fish & Shellfish:								
Fresh, frozen & processed 1/	101.5	93.6	980.9	838.2	36.4	31.9	329.9	268.7
Exports:								
Fish & Shellfish:								
Processed only 1/ (excluding fresh & frozen)	3.6	2.6	27.3	20.0	2.0	1.2	11.9	10.2

1/Includes pastes, sauces, clam chowder and juice, and other specialities.

Compared with the same month in 1961, the imports in October 1962 were up 8.4 percent in quantity and 14.1 percent in value. There was a sizable increase this October in imports of fish blocks and slabs, canned sardines not in oil, canned oysters, and frozen shrimp. But imports were down for fresh and frozen salmon, canned salmon, frozen albacore tuna, canned tuna in brine, canned sardines in oil, and canned crab meat.

In the first ten months of 1962, imports were up 17.0 percent in quantity and 22.8 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed this year for most imported fishery products. Most fishery products were imported in greater quantity this year and imports were up substantially for fish blocks or slabs, frozen tuna (increase mostly from Japan and Peru), canned tuna in brine other than albacore (increase mostly from Japan), canned sardines in oil and not in oil, frozen shrimp, and sea scallops. Imports were down for the following products: haddock fillets, fresh and frozen salmon (mostly from Canada), canned albacore tuna in brine, canned bonito and yellowtail, and canned crab meat.

Exports of processed fish and shellfish from the United States in October 1962 were up 44.0 percent in quantity and 81.8 percent in value as compared with the previous month. Exports were up in October 1962 for all important processed fishery products except canned sardines not in oil. There was a large increase in exports of canned squid (mostly to Greece and the Philippines) and the higher-priced canned salmon (mostly to the United Kingdom).

Compared with the same month in 1961, the exports in October 1962 were up 38.5 percent in quantity and 66.7 percent in value. There was a big increase this October in exports of canned salmon and canned squid. Exports were also up for canned sardines in oil and canned shrimp. But exports were down for canned mackerel and canned sardines not in oil.

Processed fish and shellfish exports for the first ten months of 1962 were up 37.0 percent in quantity, but the value was up only 16.7 percent as compared with the same period of 1961. Exports of the lower priced canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, canned sardines in oil, and canned sardines not in oil. But exports were down for canned shrimp (decline mostly in exports to Canada and the United Kingdom). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).

* * * * *

IMPORTS OF PRODUCTS OF AMERICAN FISHERIES, 1960-1961 AND JANUARY-APRIL 1962:

In 1961, there was a sharp increase in the quantity of tuna from United States flag vessels that was transshipped to the United States through foreign countries. Also, a significant amount of shrimp from United States flag vessels was transshipped to the United States for the first time in January-April 1962.

Table 1 - U. S. Imports of Products of United States Fisheries, 1960-61 and January-April 1962

Item	Jan.-Apr. 1962		1961		1960	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Pounds	US$ 1,000	1,000 Pounds	US$ 1,000	1,000 Pounds	US$ 1,000
Halibut	170.9	53.8	1,327.0	415.2	1,008.9	188.4
Tuna (yellowfin and skipjack)	8,938.8	1,132.6	8,938.8	2,106.1	1,660.0	208.9
Shrimp	173.1	32.6	-	-	-	-
Other fish and shellfish	14.6	3.5	-	-	-	-
Total	9,297.4	1,222.5	18,324.7	2,521.3	2,668.9	397.3

Source: Compiled by U. S. Tariff Commission from data furnished by the U. S. Bureau of the Census.

In April 1962, shrimp caught by United States flag vessels was transshipped to the United States from Guatemala City, Guatemala, and tuna was transshipped from Mancora and Paita, Peru, and Tema, Ghana.

Table 2 - Imports of Products of United States Fisheries, April 1962				
Product and Transshipping Country	Quantity	Value	U. S. Customs Port of Entry	Method of Transport
	1,000 Lbs.	US$ 1,000		
Shrimp, Frozen:				
Guatemala . .	25.1	8.8	Houston, Tex.	Airborne
Tuna, Frozen:				
Yellowfin:				
Peru	3,181.5	437.2	San Diego, Calif.	Steamship
Ghana . . .	13.6	1.6	Mayaquez, Puerto Rico	"
Skipjack:				
Peru	410.4	47.2	San Diego, Calif.	"
Ghana . . .	124.5	12.5	Mayaquez, Puerto Rico	"
Total transhippments	3,755.1	507.3		
Source: U.S. Bureau of the Census.				

* * * * *

TREND IN IMPORTS OF FISHERY PRODUCTS DURING 1961:

The value of annual imports of fishery products entering the United States rose to a new high in 1961. In that year, 112 countries shared in the United States market for fishery products. The value of fishery products imported was $397,058,000, a rise of 10 percent over the 1960 value; the quantity remained about the same. Imports of edible fishery products were valued at $335,757,000; inedible products, $61,301,000.

Table 1 - Value1/ of United States Imports of Fishery Products by Selected Countries of Origin, 1957-61					
Country	1961	1960	1959	1958	1957
	(US$1,000)				
Canada	108,035	102,878	101,967	107,005	97,404
Japan	88,261	85,256	96,226	84,872	77,202
Mexico	45,766	36,705	32,869	28,005	25,248
Peru	16,729	14,270	16,374	10,907	9,167
Norway	15,101	12,506	16,405	12,087	11,144
So. Africa Repub.	14,468	12,030	12,090	9,332	8,554
Australia	10,856	9,839	8,180	7,665	7,766
Ireland	11,528	9,306	10,000	8,775	6,022
Panama	6,707	5,767	6,458	5,852	6,291
Portugal	6,525	5,289	5,452	5,177	5,507
Ecuador	4,619	4,467	4,159	3,510	3,075
Denmark	5,246	4,342	8,239	5,728	3,463
El Salvador	5,510	4,215	1,297	660	60
West Germany	4,160	4,100	1,814	1,805	1,008
Brazil	5,074	3,916	3,002	2,359	2,337
Cuba	1,793	3,901	4,810	5,542	6,282
Chile	2,089	2,630	1,282	2,007	1,130
Netherlands	1,736	2,562	2,628	1,509	2,496
India	2,777	2,363	2,239	1,547	1,407
France	2,087	2,317	2,230	1,169	1,139
United Kingdom	2,309	1,759	2,388	1,787	1,540
Angola	500	267	3,023	2,065	1,046
Other 2/	35,182	29,380	23,368	17,806	18,155
Total	397,058	360,065	366,500	327,171	297,443
1/Value at the foreign port of shipment. 2/90 countries in 1961.					

Trends by Countries: Canada, Japan, and Mexico (leading suppliers of fishery products to the United States) accounted for 61 percent of the value of fishery imports (see table 1). Canada supplied 27 percent, Japan 22 percent, and Mexico 12 percent. Peru, Norway, Republic of South Africa, Australia, and Iceland were important suppliers with trade valued over $10,000,000 each. Imports from Panama, Portugal, Denmark, El Salvador, and Brazil were valued over $5,000,000 each.

Canada, with products valued at $108,035,000, continued to be the principal supplier of fisheries products to the United States market. This value represented a gain of 5 percent over 1960. Fresh or frozen fish and shellfish products accounted for the largest part.

Canada Supplied:		
Fresh or frozen (total): . .		$ 83,657,000
Lobster	$14,570,000	
Fresh-water fish	12,173,000	
Fish blocks	14,294,000	
Groundfish fillets	11,581,000	
Salmon	5,860,000	
Halibut	6,133,000	
Flounder fillets	5,210,000	
Fresh-water fillets	5,404,000	
Other fresh or frozen . . .	8,432,000	
Canned lobster		4,682,000
Fish meal and scrap. . . .		3,544,000
Cod, haddock, etc., pickled or salted		7,420,000
Other fishery products . .		8,732,000
Grand Total		$108,035,000

Japan: The value of fishery imports from Japan was $88,261,000, an increase of more than 3 percent over 1960. Tuna and pearls were the leading commodities.

Japan Supplied:	
Fresh or Frozen:	
Albacore tuna	$ 9,671,000
Other tuna	11,088,000
Shrimp	1,201,000
Swordfish	6,391,000
Fresh-water trout	776,000
Frog legs	740,000
Canned:	
Light meat tuna in brine	11,269,000
White meat tuna in brine	7,487,000
Salmon	2,667,000
Crab meat	5,756,000
Clams	972,000
Pearls, cultivated	16,136,000
Other	14,107,000
Total.	$88,261,000

Mexico ranked third as a supplier of fishery products to the United States. Shrimp was the principal commodity. Mexico supplied 58 percent of the total value of all United States shrimp imports.

Mexico Supplied:	
Shrimp	$40,094,000
Other	5,672,000
Total	45,766,000

Table 2 - Value 1/ of United States Imports of Fishery Products by Area of Origin, 1961			
Area	Edible	Inedible	Total
	(US$1,000)		
North America	169,063	5,878	174,941
Asia	70,007	25,690	95,697
Europe	44,587	9,463	54,050
South America	17,456	17,535	34,991
Africa	19,118	2,252	21,370
Oceania	15,526	483	16,009
Total	335,757	61,301	397,058
1/Value at the foreign port of shipment.			

Area of Origin: During 1961, North American countries continued to be the principal source of supply for fishery products imported into the United States (table 2). Products valued at $174,941,000 (or 44 percent of total fishery imports) came from North American sources. Imports from Asian countries were second; Europe, third.

Trends by Commodities: The value of shrimp, lobsters, and groundfish imports reached record levels. Other leading products imported were: frozen and canned tuna, sardines, crab meat, fish meal, and pearls (see table 3).

Shrimp: The value of shrimp imports increased to a total of $68,538,000, 22 percent over 1960, and the highest on record. Increased shipments were from Mexico, Panama, El Salvador, Ecuador, Iran, India, and Pakistan.

Lobsters: Imports of fresh or frozen northern lobster comprised 30 percent of the total fresh or frozen lobster imports; spiny lobsters made up 70 percent. The South Africa Republic supplied 37 percent of the spiny lobster tails. Australia was second with 29 percent. In 1961, fresh or frozen lobster imports were valued at $49,040,000 and canned lobster imports at $4,779,000.

Groundfish: Imports of groundfish fillets and blocks rose steadily over the past six years; both products showed significant increases in 1961. Imports of blocks and slabs increased by 32 percent. Canadian shipments were 61 percent of total imports of groundfish fillets and blocks; Iceland also supplied 23 percent; Norway and Denmark each about 5 percent.

Tuna: The value of frozen tuna imported was $30,228,000; canned tuna, $22,175,000. Japan supplied 52 percent of the value of fresh and frozen tuna and 85 percent of the canned tuna.

Table 3 - Value 1/ of United States Imports of Fishery Products by Selected Commodities, 1957-61

Commodity	1961	1960	1959	1958	1957
	(US$1,000)				
Edible Products:					
Fresh or Frozen:					
Shrimp	68,538	56,380	52,306	43,162	35,415
Tuna	30,228	31,713	29,728	25,377	16,765
Groundfish fillets and blocks	42,595	33,265	38,759	30,431	27,417
Lobster	49,039	44,794	38,635	35,661	36,827
Other	63,547	61,845	60,940	63,243	55,575
Total fresh or frozen	253,947	227,997	220,368	197,874	171,999
Canned:					
Tuna	22,175	19,142	21,688	16,882	17,002
Salmon	3,545	7,541	1,130	11,130	9,470
Sardines	12,543	9,115	8,370	8,564	8,957
Crab meat	5,780	5,514	7,947	6,116	6,254
Lobster	4,779	5,239	6,441	3,952	5,017
Other	17,530	16,067	17,083	15,561	14,645
Total	66,352	62,618	72,659	62,346	61,345
Other edible products	15,458	16,765	18,006	19,992	17,612
Inedible Products:					
Fish meal	16,740	11,068	15,884	11,335	9,717
Pearls	16,925	14,563	13,678	10,944	9,989
Other	27,636	27,054	25,905	24,680	26,781
Total inedible	61,301	52,685	55,467	46,959	46,487
Total fishery imports	397,058	360,065	366,500	327,171	297,443

1/Value at the foreign port of shipment.

Fish Meal: The quantity of fish meal imported during 1961 was valued at $16,740,000, an increase over 1960. Peru, Canada, Chile, and the South Africa Republic remained the leading suppliers.

Duties Collected: Duties collected on imports of fishery products into the United States during 1961 were $16,904,000 or 7 percent higher than in 1960. Duties collected and the average ad valorem equivalents for the years 1957-61 are listed below:

Year	Duties Collected	Average Ad Valorem Equivalent Percent
1961	16,904,000	4.3
1960	15,857,000	4.4
1959	17,737,000	4.8
1958	16,645,000	5.1
1957	15,955,000	5.4

Vessel Mortgage Insurance Program

STEEL TRAWLER FOR NEW ENGLAND FISHERY BEING BUILT UNDER PROGRAM:

The first large steel trawler (the Massachusetts) to be added to the Boston, Mass., fishing fleet in 11 years has been constructed under an insured loan contract approved by the Fish and Wildlife Service's Bureau of Commercial Fisheries, the U. S. Department of the Interior announced on November 17, 1962.

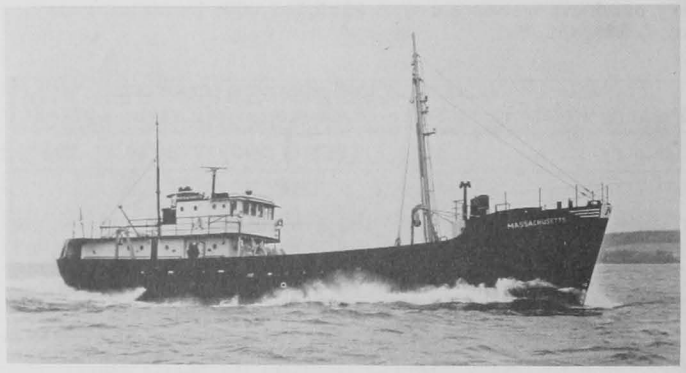


Fig. 1 - The large steel trawler Massachusetts, the first of its type to be added in 13 years to the Boston fishing fleet.

The insured loan is for about $225,000 and was made to the Boston Fishing Boat Company, Inc., under a contract with the John Hancock Mutual Life Insurance Company. The total cost is to be approximately $450,000, of which $150,000 will be covered by Federal Government subsidy. An original investment of $120,000 was made by dealers and merchants on the Boston Fish Pier who formed a corporation (Boston Fishing Boat, Inc.) as evidence of their confidence in the potential growth of the Boston fishing industry. Additional funds were realized by a loan of $225,000 from the John Hancock Mutual Insurance Company. This loan is guaranteed by the United States Government.

The 124-foot trawler is being built by the Sturgeon Bay Shipbuilding and Dry Dock Com-

pany, Sturgeon Bay, Wis., and will be used in the New England groundfish fishery. When the vessel is completed and accepted, the insured construction loan will be replaced by a contract of mortgage insurance with the U. S. Bureau of Commercial Fisheries. Powered by an 800-hp. Diesel engine with a cruising speed of 13 knots, the trawler has a capacity for 300,000 pounds of fish. Among the electronic devices carried are Loran, fish finder, depth finder, radar, radio, etc.

Fig. 2 - Christening of the steel trawler Massachusetts about a week before it sailed on November 22, 1962, from Sturgeon Bay, Wis.

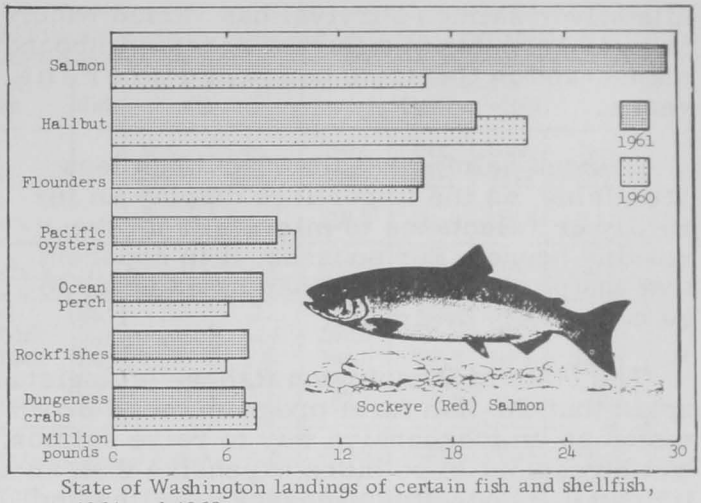
The Boston Fishing Boat, Inc. was organized by Thomas A. Fulham, who is associated with Fulham Brothers and the Boston Fish Market Corporation. There are 29 principal shareholders in the Boston Fishing Boat Company. The owners are firms and individuals in the Boston area engaged in producing and marketing fishery products or in businesses related to or supplying the commercial fisheries. A sistership (Sturgeon Bay) is being built and is expected to arrive in Boston early in 1963. It is expected that 7 million pounds more fish per year will be landed at Boston by the two new trawlers.

Washington

FISHERY LANDINGS, 1961:

Landings of fish and shellfish at Washington State ports during 1961 amounted to 120.4 million pounds with an ex-vessel value of $18.7 million. Compared with 1960, this was a gain of 7.3 million pounds or 6 percent in quantity, and $3.2 million or 20 percent in value. The sharp increase in the catch of salmon (up 13.4 million pounds) was largely responsible for the year's greater production.

Salmon, with 29.9 million pounds, was the leading species. Halibut was next with a catch of 19.4 million pounds. There were additional landings of this species by the Canadian hali-



State of Washington landings of certain fish and shellfish, 1961 and 1960.

but fleet totaling 2.5 million pounds in 1961 and 4.5 million pounds in 1960. Flounders ranked third in quantity during 1961 with 16.5 million pounds, and Pacific oysters fourth with 8.6 million pounds. Ocean perch, rockfishes, and Dungeness crabs followed with 7.9, 7.2, and 7.1 million pounds, respectively. Those 7 varieties of fish and shellfish comprised 80 percent of the 1961 total Washington landings.

* * * * *

SALMON FARM PROGRAM PROVES EXPENSIVE:

The "fish farm," or controlled natural rearing area, has been one of the most recent developments in salmon propagation in the Northwest. The technique to rear a variety of warm-water fish has been used for centuries in various countries. Since 1957, some 29 areas involving 1,600 acres of "cold" water have been placed in salmon production in the State of Washington.

Those controlled natural rearing areas encompass both fresh- and salt-water lakes and lagoons. In developing them, all competitive and predator fishes are removed. Silver (coho) and chinook salmon are the principal species involved in the program, although experimental plants of pink and chum salmon have also been made.

In a report before the annual American Fisheries Society meeting in September 1962, the Assistant Director of the Washington Department of Fisheries stated that it is too early to say whether those areas are proving successful. Results to date, although highly encouraging for silver, indicate that many problems remain to be solved. Juve-

nile silver salmon survival has varied widely (2 to 46 percent) in different rearing impoundments, and in the same ponds in different years.

Chinook salmon results have been less promising, as the fingerlings display an inability or reluctance to migrate from the rearing ponds. For success, it is apparent that the ponds must be constructed so as to be completely drainable.

The State of Washington fishery biologist noted that the fish farm program, once promoted as an inexpensive way to raise salmon, has turned out to be more expensive than anticipated. "Including necessary sealing and water and fish control structures, those areas are currently costing as high as $10,000 per acre to develop. Just what an adequate operating budget will ultimately be is yet to be determined."

He concluded: "With continued work conducted in a careful and logical manner, fish farming and artificial spawning areas may become valuable supplements to natural production. In immediate cases where there is no choice, fisheries agencies may have to gamble on such facilities as replacement for inundated spawning areas . . . but, those agencies, in response to their accepted responsibilities, cannot support a new and untried method of salmon propagation as an immediate and complete replacement for vast natural spawning areas."

Note: See Commercial Fisheries Review, July 1962 p. 43.

Wholesale Prices

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in November 1962 edged slightly downward (dropped 0.6 percent from October) for the second consecutive month. The November decline was about the same as from September to October 1962 following a 2-month period of price increases for western halibut, and fresh and frozen shrimp. As compared with November a year earlier, prices were up 4.0 percent because of higher prices for most of the fishery products included in the index except canned fish.

The drawn, dressed, or whole finfish subgroup this November was up only slightly (increased 0.1 percent) from the previous month, but was still 12.5 percent higher than in November 1961. Higher prices this November for large drawn fresh haddock at Boston (up 6.1 percent) and Great Lakes yellow pike at New York City (up 13.8 percent) more than offset the 1.3-percent drop for frozen dressed king salmon at New York City and the 6.9-percent drop for fresh Lake Superior whitefish (wholesale price at Chicago down 5 cents a pound). As compared with November 1961, prices were up sharply for all items in the subgroup, but Lake Superior whitefish prices were down 20.6 percent.

Higher prices this November for fresh small haddock fillets at Boston (up 3 cents a pound or 7.9 percent) were responsible for the increase of 0.2 percent from October to November in the fresh processed fish and shellfish subgroup index. Fresh shrimp prices at New York City were down slightly (dropped 1 cent a pound) from the previous month, but fresh shucked oysters (standards) at Norfolk remained at the October price level. The subgroup index this November was up 9.2 percent from a year earlier because of higher prices for fresh small haddock fillets (up 20.6 percent) and South Atlantic fresh shrimp (up 18.8 percent) at New York City.

Fig. 1 - Unloading a small dragger at the State Pier, Gloucester, Mass.

Processed frozen fish and shellfish prices in November 1962 were down 1.6 percent from the previous month because of a 4.0-percent drop in frozen shrimp prices (down 4 cents a pound) at Chicago. All other items in the subgroup were higher priced from October to November. Prices at Boston from October to November increased 7.2 percent for ocean perch fillets, 3.8 percent for flounder fillets, and 1.4 percent for haddock fillets. As compared with November 1961, the subgroup index in November 1962 was up 14.7 percent. Prices were up for frozen shrimp by 21.3 percent, ocean perch fillets by 12.6 percent, and other frozen fillets by 4 to 6.5 percent.

Fig. 2 - View looking north on South Street in the salt-water section of New York City's Fulton Fish Market.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1962 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes 2/ (1957-59=100)			
			Nov. 1962	Oct. 1962	Nov. 1962	Oct. 1962	Sept. 1962	Nov. 3/ 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					118.3	119.0	119.8	113.7
Fresh & Frozen Fishery Products:					123.7	124.3	125.6	110.2
Drawn, Dressed, or Whole Finfish:					120.8	120.7	125.0	107.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.11	87.2	82.2	78.1	75.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.44	129.6	129.6	126.6	103.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.96	.98	134.5	136.2	146.3	118.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.68	.73	100.7	108.2	98.5	126.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.54	.48	88.5	77.8	91.7	77.8
Processed, Fresh (Fish & Shellfish):					124.0	123.8	123.1	113.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.38	99.6	92.3	86.2	82.6
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.04	1.05	121.9	122.5	125.4	102.6
Oysters, shucked, standards	Norfolk	gal.	7.75	7.75	130.7	130.7	126.5	132.8
Processed, Frozen (Fish & Shellfish):					120.7	122.7	122.8	105.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.41	.40	103.9	100.1	100.1	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.36	107.0	105.5	101.1	102.6
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.32	118.3	110.4	110.4	105.1
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.09	1.13	128.7	134.0	136.4	106.1
Canned Fishery Products:					109.4	110.2	110.2	120.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	25.50	25.50	111.1	111.1	111.1	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	5.25	101.6	118.5	118.5	110.6
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.11	119.4	116.9	116.9	157.9

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/ Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/ Recomputed to be comparable to 1957-59=100 base indexes.

Canned fishery products prices in November 1962 dropped slightly (down 0.7 percent) from the previous month, and were 8.9 percent lower than in November 1961. The drop in the subgroup index for canned fish from October to November was not significant since it was caused by lower prices for California canned sardines, a product on which stocks were virtually exhausted and unlikely to be replenished as a result of the failure of the 1962 California sardine season. By the end of November, sardine landings at California were the lightest on record, and were down to about half the previous record low in 1953. Prices this November for canned tuna and canned Pacific salmon were unchanged from the previous month, but canned Maine sardine prices rose 2.1 percent due to a spurt in demand for the back-to-normal 1962 pack of over 2 million cases. As of the end of November, the 1962 California canned tuna pack totaled 10.5 million cases, or 0.5 million cases more than for the same period in 1961. The 1962 Alaska salmon pack was better than anticipated. As compared with a year earlier, canned fish prices were lower for all products in the subgroup. Prices for canned Maine sardines this November were down 24.4 percent from the same month in 1961 when stocks were critically low because of a very light pack.